Bundesministerium
für Wirtschaft
und Energie

Becoming climate neutral – remaining competitive

(Note: The GES commentary begins on page 4 with the measures)

Energy supply is a key location factor for the German economy – it stands for reliability, stability and resilience. However, the transition to a climate-neutral energy supply presents complex challenges: cost efficiency, security of supply and international competitiveness must be constantly rebalanced. An honest assessment of the current situation is essential.

The monitoring agreed in the coalition agreement has revealed uncertainties, among other things with regard to the development of demand for electricity and hydrogen. Above all, this monitoring points to glaring gaps in the existing future scenarios for the energy transition. In particular, too little attention has been paid to the actual solvency of industry, commerce and households. As a result, the public funding required to support the transition, which is determined by the limits of this solvency, has not yet been reliably calculated.

The path to sustainable, affordable energy requires more market, more openness to technology and instruments that promote innovation and increase social acceptance. Energy policy must be pragmatic and flexible, and misguided investments and overregulation must be avoided. Only in this way can climate targets be successfully achieved.

Analysis of the current situation

The German energy transition is at a crossroads. The successes achieved so far in expanding renewable energies are obvious and a great achievement for Germany, but the next steps will be much more difficult. The installed capacity from solar and wind power currently exceeds real demand at times, while at times when there is little wind and little sun, the supply gap

can only be closed by fossil fuel producers or imports. The assumption that electricity from renewable energies can be provided at virtually no cost is incorrect when considering the overall system – this short-sighted view creates enormous economic risks. Photovoltaic systems and wind turbines only produce energy when the sun is shining and the wind is blowing. However, as electricity is always needed regardless of these factors, renewable energies alone are not sufficient – the result is high investment in the entire electricity system, especially in infrastructure, storage, grid expansion and backup capacities, which are necessary for a reliable electricity supply. Added to this are enormous costs for grid bottlenecks (curtailment, redispatch) that arise when the grids cannot absorb and transport the electricity generated. All these costs make our energy system more expensive and ultimately have to be paid for by consumers and businesses via their electricity bills. In turn, the state has to counteract this with ever-increasing budgetary measures in an attempt to maintain social sustainability and competitiveness.

Another consequence of uncontrolled electricity production from renewable energies is expensive surpluses, which are often subsidised and exported abroad, while prices and uncertainty rise for domestic consumers and businesses. At the same time, the cost of natural gas imported from abroad influences the production costs of our gas-fired power plants and thus also our electricity prices (merit order effect). Added to this is the insufficient development and integration of flexibility potential in the market, as price signals, digitalisation and smart meter rollout have not yet been consistently used or implemented, and operators of wind power and photovoltaic systems have no incentive to address the flexibility of their customers due to the subsidy regime.

Energy prices, and electricity prices in particular, must be internationally competitive so that no company, product or idea fails because of the price of electricity. Today, energy prices are a burden on Germany as a production location in international competition – for both industry and small and medium-sized enterprises. At the same time, electricity should be an economic good whose costs are determined by the market and not permanently distorted by subsidies. The economic burdens resulting from this are considerable – all support measures and requirements are ultimately borne by consumers or taxpayers. The development of energy prices has also become a social issue.

Security of supply – one of the greatest achievements in German industrial history – is at risk of falling behind due to hasty changes and overly complex regulatory mechanisms. The phase-out of nuclear energy and the gradual shutdown of coal-fired power generation by 2038 is ambitious; stable, reliable base load power plants must be rebuilt as the backbone of the

supply – primarily through modern gas-fired power plants with the prospect of conversion to hydrogen and through technological openness in the selection of different solutions. Flexibility potential must be consistently exploited.

The European dimension is indispensable: in the internal electricity market, different national conditions and strategies require a high degree of coordination, partnership-based integration and flexibility. We are acting in close coordination with the European Commission and our European partners, as underlined by the Franco-German Energy Ministerial Council in Toulon, the North Sea Summit and bilateral cooperation projects with our neighbours.
We will overcome energy policy divides in the EU and leverage the undeniably high cost-reduction potential of a better-integrated European energy system.

We are not alone in the world. Therefore, our efforts in climate protection must also be more firmly embedded in the European and international context. In addition to crediting negative emissions, this also includes recognising serious and verifiable climate protection measures in other countries. We must agree on effective measures before we set new, ambitious climate targets. And we must be clear about the economic costs of achieving these targets in all areas and the burdens this will place on consumers, the economy and government budgets.

Implementing the goal of climate neutrality presents us with major challenges in energy and industrial policy. A one-sided focus on certain technologies or questions of definition – such as "green hydrogen" – blocks innovation, prevents flexible supply structures and slows down economic development. Equally critical is the lack of clarity in legislation and regulations: Over 15,000 legal norms constantly put the energy policy triangle of goals – secure, affordable and environmentally friendly – to the test, leading to conflicts in implementation, inefficient structures and excessive administrative burdens. We must create more clarity here and, wherever possible, streamline the regulatory details.

Against this backdrop, German energy policy must be realigned: pragmatism, market-based rationality, innovation-friendliness and broad technological openness are essential to secure prosperity, jobs and climate targets for the next generation. The path to achieving this requires clear guidelines instead of detailed control, transparent funding mechanisms, controllable and degressive burdens on the public sector, and a systematic return

to economic principles. This is particularly important given that we will continue to expand renewable energies.

This monitoring report by BET and EWI *Energiewende.Effizient.Machen* presents key findings that describe the path for the further development of the German energy system. However, it has also become clear that the necessary calculatory basis for the required overall economic cost analysis of the energy system is still lacking. Such an analysis is necessary to achieve complete transparency for decision-making. It must be tackled immediately as a follow-up task.

Ten key measures that are good for the economy and competition

1. Honest demand assessment and realistic planning

The decision-making criterion in the future will be system costs. In other words, the sum of the costs for generation, grids, storage and security of supply. The principle must be that we only build as much as we actually need and as is economically efficient. This will enable us to avoid inefficient overcapacity. Expansion paths for renewable energies and grid infrastructure should be based on realistic electricity demand scenarios. According to various studies, these scenarios range from 600 to 700 TWh for the year 2030. It can be assumed that electricity demand will be closer to the lower end of this range. Further projections therefore require adjustments to offshore capacity, offshore grid connections and high-voltage direct current (HVDC) lines, which should also be adjusted to realistic demand in the period leading up to 2045.

GES supports the future orientation of the decision criteria for the generation mix towards the system costs of the individual energy sources. This will require an adjustment of the expansion targets for solar and wind power, as renewable energies are a key driver of grid expansion costs. GES called for a more realistic electricity demand forecast for 2030 as early as mid-2024 as a basis for the renewable energy expansion targets, as the ramp-up of BEVs, heat pumps and hydrogen is lagging significantly behind the political targets. Deindustrialisation in Germany is also continuing due to the high energy costs in Germany – this exodus will dampen the expected growth. GES considers an electricity demand of around 600-650 TWh in 2030 to be realistic, and the expansion plans should be adjusted accordingly.

2. Promoting renewable energy in a market- and system-friendly manner

The future support regime for renewable energies will be system- and market-oriented. This means the consistent abolition of fixed feed-in tariffs and the complete termination of remuneration in the event of negative prices. Instead, as required by European law for the future subsidy regime, differentiated financing models – such as bilateral contracts for difference (CfDs) and clawback mechanisms – will be developed and implemented. Long-term power purchase agreements (PPAs) reduce the risks for investors. In addition, an obligation to market directly is to be introduced for new installations.

GES calls for an end to fixed EEG subsidies for all new wind and PV installations, as these create false incentives, and for an end to the feed-in priority for new renewable energy installations, so that renewable energy installations can be integrated into the market. In this respect, the BMWE is on the right track. The BMWE had already announced that it would completely discontinue the particularly expensive and now also unnecessary subsidy for rooftop PV systems. We suggest that the need for public subsidies should also be critically reviewed for new ground-mounted PV systems and onshore wind farms, which should only be built with coupled battery storage. The current annual cost to taxpayers of around €20 billion for the EEG feed-in tariff alone is economically unsustainable! After 25 years of subsidies, new renewable energy plants must be able to compete in the market on their own merits.

3. Synchronise the expansion of grids, renewable energy and decentralised flexibility

We are sticking to the goal of increasing the share of electricity generated from renewable energies in gross electricity consumption to 80 per cent by 2030. GES has used a model of electricity system costs for Germany to demonstrate that an EE expansion rate of 80 per cent is significantly above the economically viable share of solar and wind power. GES considers a share of around 70% to be more cost-effective for electricity system costs in Germany if nuclear power is abandoned for political reasons – without compromising climate targets. If Germany, like virtually all other industrialised countries in the world, were to rely on climate-neutral nuclear power as a disposable source of generation, the cost-optimal share of solar & wind in Germany would be considerably lower – due to the comparatively below-average RE yields and very high RE system costs in this country. A rational policy that aims to achieve competitive electricity costs would also include the use of nuclear power (e.g. in the form of SMRs) in the mix of options.

According to studies, further development of instruments for the spatial control of the expansion of renewable energy plants and storage facilities can accelerate the connection of plants, increase usable feed-in and optimise grid expansion in line with demand. The combination of renewable energy plants with storage facilities can enable electricity feed-in that is more in line with demand and absorb peaks in generation. Grid traffic lights, cable pooling, capacity-based grid fees and regionally differentiated construction cost subsidies and bonuses create incentives for grid-friendly expansion of plants and efficient use of existing grid capacities. Where the grid situation is critical, the investor bears a higher share of the expansion costs; in favourable locations, accelerated grid connection can be achieved at reduced costs. Digital queue management systems facilitate the bundling of connection requests. Wherever possible, additional costs should be avoided by using underground cabling.

GES: These are all sensible measures to somewhat dampen the massive increase in grid costs driven by the massive expansion of renewable energies through the Renewable Energy Sources Act ( ). However, they are not sufficient to bring electricity system costs back to the level of our neighbouring countries in the medium term.

4. Rapid implementation of a technology-neutral capacity market

Security of supply must be guaranteed at all times. Tenders for flexible base load power plants, in particular gas-fired power plants with the prospect of conversion to hydrogen, will be prioritised and designed pragmatically. The aim is to optimise incentives for the cost-efficient provision of secure capacity. The technology-neutral capacity market will be introduced in 2027 if possible and will guarantee investment and planning security for all market players. The experiences of neighbouring EU countries will be taken into account and bureaucratic complexity will be reduced to the necessary minimum. By the end of this year, we need clarity on the first tenders for the construction of new gas-fired power plants. GES supports this, in particular the technology-neutral tendering of gas-fired power plants, which should also allow gas-fired power plants with CCS in order to minimise the costs of the necessary back-up system, especially for the annual dark doldrums in winter.

5. Advancing flexibility and digitalisation of the electricity system

Demand flexibility and the digitalisation of the electricity system are systemic levers for increasing efficiency and a prerequisite for the efficient synchronisation of grid, renewable energy, storage and electrolyser expansion. Consumers receive market-based price signals. Load management, batteries and other flexibility tools are integrated into variable electricity tariffs and grid fees. The rollout of smart meters is ambitious, accelerated and at least cost-neutral for consumers (installation rate across Germany currently less than 3%) in order to enable real-time analysis and home energy management systems in the future. Responsibility for the mandatory rollout will lie with the distribution network operators and thus within regulated fixed assets. These points are also included in the GES "Guidelines for the 2025 Coalition Agreements" in January 2025. Local and decentralised flexibility will be enhanced through aggregator models and regulatory changes. The technologies used must be future-proof.

6. Maintaining and expanding uniform and liquid energy markets

Energy prices and market liquidity are key location factors. The uniform electricity bidding zone will be retained; free markets for electricity, gas, hydrogen and CO_2 create attractive conditions for industry, investors and consumers. Market fragmentation and excessive intervention in price formation and supply structures are avoided. Liquidity and price peaks specifically promote the expansion of flexibility and strengthen the possibility of hedging transactions. Measures to increase the efficiency of grid congestion management ( ) are to be developed and implemented in the short term.

7. Review subsidy schemes, systematically reduce subsidies

All support measures and subsidies will be reviewed in terms of their economic benefits and reduced to the absolute minimum necessary. Electricity prices must be

based on market mechanisms – not kept artificially low through permanent subsidies. GES: very important! Support measures are specifically targeted at energy-intensive companies, research and innovation and are limited in time to ensure sustainable competition. Complex subsidy logic will be replaced by market-oriented, results-oriented instruments; European emissions trading (ETS) will take the lead in rewarding the most efficient forms of energy. A central role for a cap and trade system such as the EU ETS is also the core recommendation of the DIHK study, which was prepared by Frontier Economics with the support of GES. We need a realistic solution for industry that maintains its international competitiveness. GES sees no possibility of achieving internationally competitive electricity costs for energy-intensive industry and all companies in Germany based solely on solar and wind power. This would also require the option of climate-neutral electricity generation from nuclear power.

8. Advancing future-oriented research, promoting innovation

Innovation and technical progress are essential for shaping the energy system of the future. Promoting research and development helps to drive technological development, tap into economic scaling potential and also reduce costs. Growing demand in areas such as digitalisation, artificial intelligence and the electrification of sectors and value chains places additional demands on the electricity system, which must also be met through the use of innovation. We want to tap into the potential of new technologies such as deep geothermal energy, fusion, hydrogen and its derivatives (in all colours) and carbon capture, utilisation and storage (CCS/CCU) so that they can make a substantial contribution to cost efficiency in the future. The use of artificial intelligence will be key to the success of a decentralised energy system. Sufficient capacity for and the rapid implementation of

data centres will be a prerequisite for this. Germany must not stand aside from the research efforts of our partners around the world.

9. Promote the ramp-up of hydrogen pragmatically, reduce overly complex requirements

The ramp-up of hydrogen is ambitious, but flexible and open to all technologies. Overly complex requirements – such as the strict definition of "green hydrogen" at EU level – will be removed and replaced by pragmatic criteria . Low-carbon hydrogen is treated equally. GES supports the abandonment of the cost-driving, overambitious EU regulation for green hydrogen. Equal treatment of low-carbon (blue) hydrogen is absolutely necessary, and the EU definition for this must be pragmatic. The ramp-up phase will initially focus on markets where there is already a willingness to pay for hydrogen (e.g. in the refinery sector) or where demand can be stimulated at a financially and administratively reasonable cost (e.g. through the promotion of climate-neutral process heat). The implementation of the hydrogen core network, the development of foreign hydrogen potential and the creation of import corridors will take place in stages and in close coordination with measures and developments on

the demand side. The current electrolyser expansion targets will be replaced by flexible targets based on specific projects on the demand side in Germany. This is also in line with the GES position. Infrastructure projects (H_2 valleys, project cluster financing) will be launched immediately as needed.

10. Establish carbon capture, utilisation and storage (CCS/CCU) as a climate protection technology

The capture and utilisation/storage of CO_2 is essential for the decarbonisation of industrial processes. CCS/CCU must be prominently integrated into the regulatory framework in a technology-neutral manner. Sectors with emissions that are difficult to avoid – in particular cement and chemicals – but also power plants and energy producers will have access to investment aid, infrastructure support and regulatory guidance for CO_2 transport and storage. The amendment to the Carbon Dioxide Storage and Transport Act ensures planning, investment and approval security. Public acceptance is promoted through information campaigns and the transparent integration of CCS/CCU into the national strategy. GES: Very welcome correction of the previous BMWK's very restrictive ideas. The market will decide what concrete projects will come.

Conclusion

The future demands more market, technological openness, innovation, holism and system orientation. All options for flexibility are needed. Digitalisation is imperative and European cooperation is urgently needed. The implementation of the ten measures will lay the foundation for greater prosperity, a crisis-proof supply and lasting international competitiveness.
GES supports these principles for a more efficient energy transition! What is still missing: a clear option for the use of own natural gas reserves (instead of LNG imports with an unfavourable GHG footprint), the option to use advanced nuclear energy (such as SMR) as a cost-effective and reliable pillar in the energy mix, and the systematic use of global cooperation opportunities under Article 6 of the Paris Agreement. EU-funded projects to reduce greenhouse gases in the Global South in particular can generate additional certificates for the EU and Germany at relatively low cost, which can significantly reduce the financial burden of the steady shortage of EU ETS certificates over the next 15 years – without compromising global climate protection!

An honest, innovative reorientation of the energy transition is possible if guidelines are set, economic realities are accepted and the country's resources are managed with a sense of proportion and foresight. In this way, Germany will remain a modern, attractive location for industry and small and medium-sized enterprises, and can be a pioneer in Europe for a smart, economically sensible and realistic energy policy that simultaneously serves climate protection and enjoys a high level of acceptance among citizens.