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Germany’s Energy Security

Analysis in the Context of Current Natural Gas and Future Hydrogen Imports

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On the way to a climate-neutral energy system, energy imports remain indispensable for Germany. A climate-neutral Germany will only be competitive in terms of energy costs if it can benefit from the favorable generation conditions in sunny and windy regions of the world. The German government recently presented an import strategy for renewable hydrogen and hydrogen derivatives. However, concrete measures to achieve a supply structure that is robust and diversified against economic and geopolitical risks are still missing. This cep study examines the needs and design options for a future German energy strategy. The focus is on the goal of energy security, understood as a triad of resilience, economic efficiency and environmental sustainability of energy supply.

- Germany's climate and energy partnerships are an important strategic instrument for energy policies. The German government should develop a partnership strategy focused on long-term energy security. This should involve steps towards spatial and technological diversification of the partnerships. Forms of cooperation with partner countries should be geared more towards forming and stabilizing joint future supply chains.
- A cost-efficient development of import channels for climate-friendly energy sources such as renewable hydrogen requires a market-oriented state funding approach. The German government should expand its H2Global funding instrument to include flexibility options that account for diverse demand preferences and incentivize decentralized private trade in renewable hydrogen. The arsenal of available guarantee instruments should be used to hedge project risks when setting up cross-border H_2 supply chains.
- Natural gas imports remain indispensable in the transition to a climate-neutral energy mix. The conclusion of long-term supply contracts will continue to be the key to hedging against short-term global market risks in the future. Trade must be given the opportunity to respond to the changed global market situation with innovative contract models, in particular the constantly growing importance of a spatially flexible LNG supply. This requires a barrier-free EU internal market.

Executive Summary

In the short time since the start of the war in Ukraine, Germany and the other Member States of the European Union (EU) have succeeded in putting national energy supply on a new footing. A supply crisis has been avoided thanks to immediate actions at the European level. However, this has not permanently averted the external supply risks. In the phase of the transition to climate-neutral energy sources, extensive energy imports from third countries remain indispensable. This applies firstly to natural gas. In its economic growth initiative, the outgoing German government emphasized the further diversification of natural gas imports as an important instrument for greater energy security. Secondly, import markets for renewable energy sources such as renewable hydrogen must be established in the medium and long term. Hydrogen-based technologies will only establish themselves on the market if Germany and Europe can benefit from the favorable production conditions in sunny and windy regions of the world.

This study analyses Germany's political options in the struggle for greater energy security against the backdrop of the European regulatory framework. The focus is on two instruments that are particularly central to long-term energy security: Climate and energy partnerships with third countries and the promotion of long-term supply contracts.

Current supply situation

The sources of supply for natural gas are now much more diversified than in 2021. Norway and the USA in particular have been able to significantly expand their supplies and have become the two most important suppliers. There are also new players such as Azerbaijan and Qatar. Nevertheless, the EU is not yet completely independent of Russian gas supplies, and imports have recently even increased again. In addition, supplies from emerging trading partners are not free from global and country-specific supply risks that require constant monitoring and management. On the one hand, this relates to the increased dependence on global market developments due to the higher proportion of geographically flexible LNG deliveries. On the other hand, it concerns local and geopolitical security risks. The further diversification of supply routes therefore remains a permanent task. In addition to creating a stable market environment for international trade, this also requires the targeted use of energy diplomacy.

The potentials of climate and energy partnerships

The format of bilateral climate and energy partnerships has been an established instrument of German foreign energy policy for some time. Partnerships now exist with countries on all six continents. In their overall orientation, the energy and climate partnerships have so far been primarily motivated by development policy, while the establishment of joint markets and supply chains is only seen as a secondary objective. Our indicator-based analysis shows that the current partners have great and diverse potential for establishing joint supply chains for renewable energy sources. Many partner countries stand out with a significantly higher renewable energy potential than Germany. The partner portfolio also includes the countries with the greatest global patent activity in the field of energy technologies. Many of the countries have also been important trading partners of Germany for a long time. In addition, many partner countries are already in the phase of building up significant electrolysis

capacities for hydrogen production. The structural diversity of the partners makes it useful to focus on different forms of cooperation. Based on a cluster analysis, we divide the partner portfolio into six country groups with specific types of cooperation potential. The greatest short-term potential for hydrogen exports to Europe is identified for partners in North Africa and on the Arabian Peninsula.

Among the current cooperation formats, committees for bilateral coordination and information exchange such as regular round tables and business forums dominate. Forms of cooperation aimed more specifically at building production capacities in the partner countries and/or preparing joint supply chains, on the other hand, are much less common. These are only utilized by a small minority of partners. In particular, it is noticeable that cooperation in the area of knowledge exchange and transfer, such as training programs and consultations on policy design, has only played a role in a few partnerships to date. From the perspective of many partner countries, this could be a particular advantage of long-term energy cooperation with Germany.

The establishment of further institutionalized partnerships with an energy focus also remains important in the current transition phase. In addition to the countries' resource potential, geostrategic and general security policy considerations should also play a role here. Finally, diversification should be considered not only in spatial terms, but also in technological terms. Here, too, the climate and energy partnerships still offer a great deal of untapped potential for cooperation, for example in the development of supply chains for biogenic energy sources.

The crucial role of long-term supply contracts

Long-term supply contracts are the classic form of trading on the international natural gas markets. They avoid the transaction costs and market risks of short-term contractual relationships. They also secure the financing of investments in new production facilities as well as transport and storage infrastructure. Nevertheless, the share of long-term supply contracts in global natural gas trading has declined in recent years. This is primarily due to the increased importance of intercontinental LNG trading and the associated terminal infrastructure, which has increased short-term flexibility in gas transport. In addition, there is also an increased need for flexibility in the procurement of natural gas on the demand side, particularly in Europe, as the speed of the transition to renewable energies within the politically defined time frame is uncertain. To take these changed preferences into account, existing flexibility options for longer-term supply contracts must be utilized.

These includes approaches like hedging via put options. Another strategy would be the targeted conclusion of follow-up contracts with gas suppliers whose long-term contracts are due to expire. As the capacity investments have already been largely refinanced in these cases, there could be a greater willingness on the supplier side to agree on flexible terms. The parallel conclusion of resale contracts with third parties within the EU internal market would also be a fundamentally promising solution to the time uncertainty. In contrast to reselling to buyers in third countries, there would also be no carbon leakage risk here, as the emissions generated would remain within the scope of the cap in EU-wide emissions trading. In addition to an EU-wide agreement on guaranteeing the long-term operation of the natural gas infrastructure, all of these solutions require a regulatory framework that provides market actors with the necessary degree of freedom.

In order to establish long-term supply relationships for renewable hydrogen, strong demand stimuli are necessary for rapid cost reductions through scaling. The H2Global import support program

launched by the German government can fulfil an important coordination and marketing function in the start-up phase. In order to make its financing fairer and to support a barrier-free internal H_2-market, the involvement of other European partners should be consistently promoted. In addition, time limits must be set for such a centralized trading mechanism. In addition to further internationalizing the mechanism, a perspective for the medium-term transition to a decentralized trading system should be developed. We are introducing two proposals for supplementary support mechanisms into the debate that could facilitate and accelerate such a transition to decentralized marketing. The first proposal includes the possibility of financially supporting decentralized private supply contracts between exporters from third countries and local traders/end customers. The second proposal includes the additional auctioning of put options via the H2Global mechanism as a way to support domestic traders in the resale of imported hydrogen.

Policy recommendations

An important task of the new German government should be to support the resilience of existing and the development of new import markets and supply relationships on several levels. Firstly, it should promote the further diversification of energy imports through cooperation instruments at the diplomatic level. This requires a more targeted use of the instrument of climate and energy partnerships. Together with its partners, the German government should implement concrete roadmaps to intensify cooperation that are geared towards the partners' specific potential. In the current phase, funds for the development of medium-term H_2 supply channels with partners in North Africa and the Gulf states should be prioritized. Instruments that can contribute to the long-term stabilization of future supply relationships, such as research and training partnerships, should be given particular consideration. The strategic further development of partnerships should be driven forward through geographical and technological diversification.

Secondly, Germany and the EU should create a regulatory framework that ensures the existence of liquid internal energy markets with a variety of players, even in a future climate-neutral energy system. For natural gas as an energy source, this means that flexibility of use and unhindered trade in the internal market must be guaranteed in the current transition phase. This is an important prerequisite to implement innovative solutions for long-term risk hedging, such as long-term contracts with a forwarding option. In addition, the EU and Germany should move away from ideas of distorting market prices through artificial interventions such as joint procurement. For renewable hydrogen, a strategy for the accelerated development of supra-regional markets is required. The goal should be an internal hydrogen market that fulfils an efficient decentral steering function via liquid spot and derivative markets and the presence of a large number of players, similar to today's gas trading.