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THE IMPACT OF THE RUSSIAN-UKRAINIAN WAR ON GERMANY'S CLIMATE POLICY: BALANCING ENERGY SECURITY AND SUSTAINABILITY

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The Russian-Ukrainian war disrupted Germany's energy landscape, impacting its Energiewende climate policy. Reduced Russian gas supplies prompted short-term reliance on coal and accelerated development of LNG infrastructure, which led to increasing emissions and challenging the 2022-2023 climate targets. Concurrently, the crisis catalysed a renewable energy surge, with increased investments in green hydrogen, grid infrastructure, and expedited wind and solar expansion, alongside a reaffirmed coal phase-out by 2030. Using a mixed-methods approach, combining emissions data and policy analysis grounded in Energy Security and Energy Transition theories, this study evaluates trade-offs between geopolitical pressures and sustainability. It concludes that war-driven fossil fuel reliance ultimately accelerated Germany's renewable shift, aligning energy security with long-term climate goals.

Introduction

The Russian invasion of Ukraine, which started in February 2022, fractured global energy markets and profoundly impacted Germany's energy landscape. Germany has embarked on a decades-long initiative to shift its energy system towards renewable sources, primarily onshore wind and solar PV, while phasing out nuclear and fossil fuels for electricity generation³⁸. Known as the 'Energiewende' (meaning turn, or turnaround), this ambitious technical, economic, and political project enjoys

robust support from both parliament and the public. The Energiewende emerged in response to environmental concerns and the 1986 Chernobyl disaster, gaining momentum with the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz) of 2000³⁹.

Energiewende had to face a serious challenge due to the Russian-Ukrainian war. For decades, Germany has positioned itself as the global leader in climate action, by aiming to transform its energy system into a renewable-powered, low-carbon model,

38 Christian Von Hirschhausen, *The German 'Energiewende' – an Introduction*, "Economics of Energy & Environmental Policy" 3, no. 2 (2014): 1–12, <https://www.jstor.org/stable/26189273>

39 Thilo Wiertz, Lilith Kuhn, Annika Mattisek, *A turn to geopolitics: Shifts in the German energy transition discourse in light of Russia's war against Ukraine*, "Energy Research & Social Science", Volume 98, 2023, 103036, <https://doi.org/10.1016/j.erss.2023.103036>

while discontinuing the use of nuclear and fossil fuels. The sudden reduction in the Russian gas supply after the Nord Stream 2 pipeline was shut down forced Germany into a re-evaluation of both short-term energy security measures and long-term climate commitments. The war exposed the weakness in this vision, forcing the state into a high-stakes balancing act between immediate energy security and long-term sustainability. Wholesale electricity prices in August 2022 dramatically rose to a record level of 46.5 cents/kWh⁴⁰. Energy-intensive sectors (e.g., chemicals, steel) reduced output, with BASF cutting ammonia production by 20 percent⁴¹. Fears of winter shortages also prompted emergency measures.



Engiewende had to face a serious challenge due to the Russian-Ukrainian war

The study addresses two primary questions: what effects did the Russian-Ukrainian war have on Germany's long-term climate commitment and short-term energy-security measures, and what are the implications for balancing geopolitical pressure with sustainability goals? The war compelled Germany to adopt an immediate energy policy, leading to temporary reliance on coal, and rapid construction of liquefied natural gas (LNG) infrastructure,

which increased emissions and strained 2022-2023 climate targets. Concurrently, it prompted an unprecedented push for energy independence through renewables, including wind, solar, and green hydrogen.

The paper first outlines the theoretical framework and the methodology. Then it describes short-term energy measures, followed by long-term climate commitments. Finally, the implications for balancing geopolitical pressures and sustainability goals are discussed.

Theoretical Framework and Methodology

Energy security involves ensuring a steady supply of diverse energy sources in adequate amounts at affordable prices. It encompasses minimising risks from short-term or prolonged disruptions of imported energy, and securing sufficient local and imported resources to meet rising demand over time at reasonable cost⁴². According to this theory, the German government has tried to secure its energy needs by undertaking various short-term and long-term energy policies. At the same time, it focused on local sources while emphasising the use of renewable energy.

According to the energy transition theory by Michaël Aklın and Johannes Urpelainen⁴³, the fossil fuel system's deep entrenchment means renewable energy adoption typically requires external shocks to disrupt the status quo. These shocks, such as the 1973 and 1979

40 "Wholesale Electricity Prices in Germany Lower in 2024 than in 2021 with Six Nuclear Power Plants – Renewable Energy Industry," Renewable-energy-industry.com, 2024, January, 2025, <https://www.renewable-energy-industry.com/countries/article-6853-wholesale-electricity-prices-in-germany-lower-in-2024-than-in-2021-with-six-nuclear-power-plants>

41 Ludwig Burger, Focus: BASF Readies More Ammonia Production Cuts in Gas Supply Crunch, Reuters, 27.07.2022, <https://www.reuters.com/business/energy/basf-considers-more-ammonia-production-cuts-gas-supply-crunch-sources-2022-07-27/>

42 Hisham Khatib, Energy Security, World Energy Assessment, United Nations Development Programme, <https://www.undp.org/sites/g/files/zskgke326/files/publications/chapter4.pdf>

43 Michaël Aklın and Johannes Urpelainen, *Renewables: The Politics of a Global Energy Transition*, MIT Press: London 2018, pp. 43-88.

oil crises, nuclear accidents (e.g., Chernobyl in 1986), or abrupt oil price spikes, expose vulnerabilities in fossil fuel dependence, creating windows of opportunity for governments to invest in alternatives like wind and solar. These events shift public and political attention, enabling policy changes that support renewables. According to the energy transition theory, Germany adopted the policy of concentrating on renewable energy due to the external shock of the Russian-Ukrainian war.



Germany reactivated coal-fired power plants to compensate for the gas shortages

The study has taken a mixed methods approach to assess the war's impact on Germany's energy policy. Quantitative analysis draws data from various government sources. Qualitative analysis examines policy documents, legislative change, and government reports from 2022-2024, focusing on shifts in the Energiewende framework. By using these methods, the study captures both the measurable impacts of the war and the policy responses.

Short-Term Energy Measures

Germany reactivated coal-fired power plants to compensate for the gas shortages. These plants, which were slated for phaseout under the Energiewende, were

brought back to avoid an energy crisis. In March 2022, German legislators passed a law requiring gas storage facilities to be nearly fully stocked at the beginning of the heating season, to ensure a secure winter energy supply⁴⁴. Germany has historically depended on Russian natural gas to supply its residential and industrial sectors. Several coal-fired units at RWE and LEAG's Niederaußem, Neurath, and Jaenschwalde power plants were temporarily restarted, to enhance the stability of the country's electricity supply⁴⁵. In 2022, coal's share of electricity production rose from 28% to 33%, increasing CO₂ emissions compared to 2021⁴⁶. This move challenges Germany's 2020 commitment to reduce emissions 65% by 2030, compared to 1990 levels.

Apart from coal, Germany also expedited the construction of temporary LNG terminals in Wilhelmshaven, Brunsbuttel and on the island of Rügen with four ships – so-called Floating Storage and Regasification Units (FSRUs) – to diversify gas supply⁴⁷. Germany did not have its own LNG regasification terminals, so it imported LNG through terminals in nearby countries like Belgium and the Netherlands. Some LNG also arrived by road transport. For a long time, building LNG terminals in Germany did not seem cost-effective, because the country was well-supplied with gas through pipelines from neighbouring countries, and Europe's LNG terminals were largely underused. Critics pointed out that plans were excessive and jeopardised national and European climate goals⁴⁸.

44 Darrell Proctor, Germany Set to Increase Coal-Fired Generation in Face of Gas Crunch, *POWER Magazine*, 20.06.2022, <https://www.powermag.com/germany-set-to-increase-coal-fired-generation-in-face-of-gas-crunch>

45 *Ibid*

46 International Energy Agency, Coal, IEA, 11.07.2023, <https://www.iea.org/energy-system/fossil-fuels/coal>

47 Germany to Have Two More Floating LNG Import Terminals in Operation by Winter – Operator, Clean Energy Wire, 7.10.2024, <https://www.cleanenergywire.org/news/germany-have-two-more-floating-lng-import-terminals-operation-winter-operator#>

48 *Ibid*

Shortly after Russia's invasion of Ukraine, Chancellor Scholz declared that Germany would construct two LNG import terminals within the country⁴⁹. Economy and Climate Minister Robert Habeck emphasised that this move was essential to "govern energy supply on our own state territory and guarantee sovereignty."⁵⁰ The German government promptly committed to co-fund the Brunsbüttel terminal project, with a 50 percent stake, and later pledged support for additional projects. To expedite permission and construction, the government enacted the LNG Acceleration Act, on June,1, 2022⁵¹. The law allows licensing authorities, under specific conditions, to bypass certain procedural requirements, particularly those related to environmental impact assessments, on a temporary basis.



For a long time, building LNG terminals in Germany did not seem cost-effective, because the country was well-supplied with gas through pipelines from neighbouring countries

The German government urged citizens to cut energy use, so as to reduce reliance on Russian gas imports. Former Economy Minister Robert Habeck suggested driving less and using public transport more⁵². He also recommended that employers allow

remote work on certain days, to save energy used on commuting. Other ideas included biking or taking trains instead of cars. Habeck noted that these steps could lower Germany's energy use by up to 10 percent. The German government started a campaign to encourage people to save energy as part of its goal to achieve climate neutrality. Named 80 Million Together for Energy Change, the campaign invited everyone to help reduce energy use⁵³. A wide range of groups, including social, industrial, environmental, and consumer organisations, supported the government's efficiency efforts, and committed to promoting energy-saving measures through their own initiatives.

Long-term Climate Commitments

While short-term measures leaned on fossil fuels, the war catalysed significant advancements in Germany's long-term climate strategy, supporting Energiewende's renewable energy focus.

On April 6, 2022, the Easter Package was adopted for immediate climate action. Germany recognised that renewable energy was a matter of national security. In what was arguably the most ambitious overhaul of energy policy in decades, specific measures were outlined to significantly accelerate the expansion of renewables, on water, land, and rooftops. Germany's plan focuses on making renewable energy a top priority for public interest and safety⁵⁴. To achieve this, more

49 Ukraine War Pushes Germany to Build LNG Terminals, Clean Energy Wire, 11.05.2023, <https://www.cleanenergywire.org/factsheets/liquefied-gas-does-lng-have-place-germanys-energy-future#>

50 *Ibid*

51 German LNG-Terminals: Hydrogen Infrastructure by Detour?, Twobirds.com, 2024, <https://www.twobirds.com/en/insights/2024/germany/german-lng-terminals-hydrogen-infrastructure-by-detour>

52 Reuters Staff, "Germans Should Save Energy to Put Pressure on Russia – Minister," *Reuters*, 14.04.2022, <https://www.reuters.com/business/energy/germans-should-save-energy-put-pressure-russia-minister-2022-04-14/>

53 Admin, 80 Million Together for the Energy Switch, Bmwk-energiewende.de, 2022, <https://www.bmwk-energiewende.de/EWD/Redaktion/EN/Newsletter/2022/06/Meldung/topthema.html>

54 Admin, What's inside the Easter Package, Bmwk-energiewende.de, 2022, <https://www.bmwk-energiewende.de/EWD/Redaktion/EN/Newsletter/2022/04/Meldung/topthema.html>

land will be opened up for solar panels, more communities will be involved in wind and solar projects, and areas with less wind will be used for wind farms. The government will also make it easier to install solar panels on rooftops.

To support these changes, several energy laws have been updated, including the Renewable Energy Sources Act, the Offshore Wind Energy Act, the Energy Industry Act, the Federal Requirements Plan Act, and the Grid Expansion Acceleration Act.



While short-term measures leaned on fossil fuels, the war catalysed significant advancements in Germany's long-term climate strategy, supporting Energiewende's renewable energy focus

Germany planned to increase its renewable energy share to at least 80 percent of domestic gross electricity consumption by 2030. By accelerating the growth of renewables and electrification, the country aimed to significantly reduce its dependence on fossil fuel imports, especially natural gas. The auction volumes for wind and solar power were to be adjusted, to align with the new 2030 expansion goal⁵⁵.

To ensure that nearly all electricity would come from renewables by 2035, the revised Renewable Energy Sources Act suggested numerous measures to boost solar power

expansion, speed up onshore wind energy development, and shift biomass use towards highly flexible peak-load power plants. The plan also sought to strengthen community energy initiatives, and increase financial participation from municipalities⁵⁶.

Germany doubled down on green hydrogen as a bedrock of its energy transition⁵⁷. It is investing in green hydrogen, generated by using wind and solar power through electrolysis, as a substitute for fossil fuels. It will help German products, like cars and steel, stay competitive as consumers and investors increasingly demand goods with significantly lower carbon emissions. In 2024, Germany's upper house of parliament, the Bundesrat, approved a new plan to fund the roughly 20 billion euro needed for the country's hydrogen pipeline network, clearing the final legislative step. Under the new law, the government can provide initial funding for a special entity responsible for constructing the hydrogen pipeline network. This network will be managed by a private company made up of firms that charge users fees, which must collectively cover the construction costs by 2055. The new regulation allows the government to allocate initial funding to a dedicated company responsible for constructing the hydrogen pipeline network. The new funding company features an amortisation account, a special bank account with an overdraft facility, enabling the government to offset the costs of building the hydrogen network with the revenue generated from user fees. As a part of this drive, Germany has partnered with Namibia to achieve its green hydrogen needs. The green hydrogen industry in Namibia is developing due to

55 World Nuclear Association, Germany's Energiewende, <https://world-nuclear.org/information-library/energy-and-the-environment/energiewende>

56 Climate Change Laws of the World, Law for the expansion of renewable energies (Renewable Energy Sources Act – EEG 2023; consolidated version), <https://bit.ly/489saCA>


57 Germany, Green Hydrogen Organisation, n.d., <https://gh2.org/countries/germany>

German investment⁵⁸. HyIron, the first hydrogen company in Namibia to secure a purchase agreement, has partnered with Benteler, a German automotive supplier. The initial plan was to produce 200,000 tons of emissions-free iron annually.

The Easter Package significantly boosted renewable energy capacity, adding 7 GW of solar and 2 GW of onshore wind in 2022, a 25% increase from the previous year⁵⁹. By 2023, wind and solar powered 52 percent of Germany's electricity, up from 42 percent in 2021. Supported by €10 billion annual investments in grid upgrades, this expansion connected northern wind farms to southern industrial hubs. The swift growth addressed immediate energy shortages, while strengthening renewables' critical role in advancing Germany's energy independence and climate objectives.

The Climate Action Program⁶⁰, embedded within Germany's 2022 Easter Package, emerged as a decisive policy response to the energy crisis triggered by the Russian-Ukrainian war, balancing urgent energy security demands with the Energiewende's vision for a sustainable future. Unveiled to counter the disruption of Russian gas supplies, which previously met over half of Germany's gas needs, the programme introduced bold measures to fast-track renewable energy deployment, including simplified approvals for wind and solar projects and a mandate to allocate 2 percent of national land for wind farms. It also enforced solar panel installations on new commercial structures, and boosted energy efficiency through a 20 billion euro investment,

tripling funding for heat pumps and building insulation to curb reliance on gas for heating. Furthermore, it upheld the 2030 coal phase-out commitment, despite temporary coal usage, and directed 3 billion euro towards green hydrogen to decarbonise industrial sectors. This multifaceted initiative not only addressed immediate energy vulnerabilities but also solidified Germany's path towards carbon neutrality by 2045, exemplifying a strategic fusion of crisis management and environmental ambition.



The Climate Action Program, embedded within Germany's 2022 Easter Package, emerged as a decisive policy response to the energy crisis triggered by the Russian-Ukrainian war, balancing urgent energy security demands with the Energiewende's vision for a sustainable future

The Russian-Ukrainian war underscored the urgent need for grid modernisation in Germany, to support the Energiewende's accelerated renewable energy expansion, and to ensure energy security. To address longstanding grid bottlenecks, particularly in transmitting wind power from the northern regions to industrial hubs in the south, the German government doubled investments in high-voltage transmission infrastructure⁶¹. These funds supported the construction and upgrading of critical grid lines, such as the SuedLink project, aimed at enhancing

58 Jasko Rust, How Germany Is Fueling Namibia's Green Hydrogen Revolution, *Deutsche Welle*, 704.2025, <https://www.dw.com/en/how-germany-is-fueling-namibias-green-hydrogen-revolution/a-72136731>

59 Federal Ministry for Economic Affairs and Energy, What's inside the Easter Package, 11.05.2022, <https://www.bmwk-energiewende.de/EWD/Redaktion/EN/Newsletter/2022/04/Meldung/topthema.html>.

60 OECD Environmental Performance Reviews. GERMANY 2023 https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/05/oecd-environmental-performance-reviews-germany-2023_e352cae0/f26da7da-en.pdf

61 Global Wind Report, 2024, <https://bit.ly/3K4tlZT>

capacity and integrating the 7 GW of solar and 2 GW of wind added in 2022. Smart grid technologies, including advanced metering and demand-response systems, were also prioritised to optimise the distribution of renewable energy, and to maintain stability despite the variability of wind and solar generation. This modernisation effort not only facilitated the rise of renewables to 52 percent of electricity production by 2023, but also reduced reliance on imported fossil fuels, aligning Germany's grid infrastructure with its dual goals of sustainability and resilience in a geopolitically volatile landscape.

Role of the European Union

The European Union's coordinated response to the energy crisis triggered by the Russian-Ukrainian war played a pivotal role in supporting Germany's *Energiewende* and fostering regional energy resilience. Through the REPowerEU plan, launched in May 2022, the EU aimed to reduce its dependence on Russian fossil fuels by 2027, while accelerating the transition to renewable energy sources. This strategy included joint gas procurement, which enabled member states to pool demand and negotiate lower prices with global LNG suppliers; stabilising markets and ensuring supply for Germany, which rapidly diversified its gas imports⁶². The EU also raised its 2030 renewable energy target from 32 percent to 45 percent, incentivising Germany to align its wind and solar expansion with regional goals. Additionally, the EU allocated €5 billion to develop cross-border green hydrogen infrastructure, supporting Germany's ambition to become a hydrogen hub. Regulatory reforms streamlined permits for renewable projects across member states, reducing bureaucratic delays that had hindered Germany's onshore wind development. Emergency measures, such

as voluntary gas consumption reductions of 15 percent in 2022–2023, eased pressure on Germany's energy system during peak demand. By fostering solidarity through shared storage facilities and interconnected grids, the EU not only mitigated Germany's immediate energy security risks but also reinforced the *Energiewende*'s long-term alignment with a decarbonised, integrated European energy market.

Implications for Balancing Geopolitical Pressures and Sustainability Goals

The Russian-Ukrainian war fundamentally altered Germany's energy framework, highlighting the tension between the geopolitical imperatives and sustainability ambitions of the *Energiewende*. The crisis exposed the fragility of relying on geopolitically volatile energy sources, underscoring the need for a resilient energy system. Yet, it also illuminated the strategic role of renewables in mitigating such vulnerabilities, pushing Germany to prioritise domestic energy solutions, as a foundation for both security and environmental progress.

In response to this upheaval, Germany enhanced its commitment to renewable energy, forging a pathway where energy security and sustainability converged. Legislative reforms, such as the *Easter Package*, streamlined approvals for wind and solar projects, leading to a 25 percent surge in installations, with renewables accounting for 52 percent of electricity by 2023. The allocation of 3 billion euro for green hydrogen development aimed to decarbonise heavy industry, while reducing reliance on foreign gas. Public sentiment shifted decisively, with 80 percent of Germans in 2023 endorsing accelerated renewable growth, a jump from

62 European Commission, Germany's Recovery and Resilience Plan, 2024, https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/germanys-recovery-and-resilience-plan_en

65 percent two years before, signalling a societal embrace of renewables as a bulwark against external shocks. The EU's REPowerEU initiative complemented these efforts, raising the 2030 renewable target to 45 percent, and enabling collective gas purchasing, which stabilised supplies and bolstered Germany's renewable ambitions within a broader European context.



the crisis also revealed enduring obstacles in harmonising immediate energy demands with long-term ecological goals. The reliance on coal and LNG, while averting energy shortages, strained Germany's industrial sectors

However, the crisis also revealed enduring obstacles in harmonising immediate energy demands with long-term ecological goals. The reliance on coal and LNG, while averting energy shortages, strained Germany's industrial sectors, with high energy costs prompting production cuts in industries like chemicals. Infrastructure limitations, particularly inadequate north-south grid connections, continued to impede the integration of renewable energy, necessitating a doubling of grid investment to €10 billion annually. Furthermore, the transition to renewables introduced new geopolitical risks, as dependence on critical minerals for renewable technologies exposed Germany to supply chain uncertainties, particularly from dominant suppliers like China. These challenges underscore the intricate balance required to sustain energy transition amidst global disruptions.

The Russian-Ukrainian war has redefined the Energiewende as a dual strategy for security and sustainability, offering lessons for global energy transitions. By 2023, Germany reduced dependence on gas import to 30 percent, with emissions falling to 720 million tonnes, driven by renewable expansion and efficiency gains. The legislated 2030 coal phase-out and completed nuclear exit, supported by enhanced EU grid connectivity, maintained energy stability, while advancing decarbonisation. Yet, sustaining this momentum requires addressing industrial competitiveness, securing mineral supplies, and scaling hydrogen infrastructure. Germany's experience illustrates how geopolitical crises can spur transformative change, aligning energy security with climate goals, provided that policies remain agile and investments robust, thus offering a blueprint for nations navigating similar challenges in an uncertain global landscape.

Germany's emissions trajectory in the aftermath of the Russian-Ukrainian war is a nuanced picture of environmental resilience and vulnerability. The sudden reliance on coal-fired power plants and LNG infrastructure in 2022 contributed to a notable rise in carbon dioxide emissions, breaching the thresholds set by the Federal Climate Change Act. Total greenhouse gas emissions for the year reached 750 million tons of CO₂ equivalent⁶³, overshooting sectoral budgets for both the energy and industrial sectors. This regression stemmed largely from emergency energy security measures, including the reactivation of lignite and hard coal plants, and delays in the decommissioning of nuclear power. However, the emission increase was not a policy failure but rather a reflection of extraordinary circumstances, requiring immediate action to stabilise national

63 Joseph Nasr, Detailed Greenhouse Gas Emissions Figures for 2022: Emissions Fell by 40 percent Compared to 1990 – EU Climate Protection Targets Met, *Umweltbundesamt*, 17.01.2024, <https://www.umweltbundesamt.de/en/press/pressinformation/detailed-greenhouse-gas-emissions-figures-for-2022>

energy supplies. In contrast, 2023 marked a partial correction. Emissions fell to under 700 million tons of CO₂, a decline attributed to a milder winter, reduced industrial output due to economic contraction, and a surge in renewable energy deployment. Wind and solar energy contributed an unprecedented share to electricity generation, indicating that structural shifts were already underway. These trends underscore the fragility of climate progress when faced with geopolitical shocks, while also demonstrating the adaptive potential of a well-supported clean energy transition. Nevertheless, the setback in 2022 raises critical questions about the sufficiency of existing climate governance frameworks, and the need for contingency mechanisms that can uphold emissions targets even during crises.



***Germany's emissions trajectory
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Germany's legislative response to the energy crisis triggered by the war illustrates how statutory agility can support both energy security and climate objectives. The government enacted emergency legislation, such as the LNG Acceleration Act, to expedite the construction of liquefied natural gas terminals, ensuring rapid infrastructure deployment without abandoning environmental oversight⁶⁴. Simultaneously, revisions to the Renewable Energy Sources Act (EEG 2023) elevated the development of renewables to a situation of overriding public interest, which helped reduce bureaucratic delays in permits and land

use. Legal provisions were also introduced to mandate regional targets for wind power development, ensuring equitable burden-sharing across states. These adaptations reveal an emerging legislative paradigm, in which climate goals are not suspended during crises but rather legally reinforced to withstand external shocks. Moving forward, Germany's legislative architecture must continue evolving to anticipate future disruptions, while maintaining democratic oversight, ecological standards, and in order to achieve alignment with EU-level climate legislation.

Conclusion

The Russian-Ukrainian war significantly disrupted Germany's energy system, by uncovering the vulnerabilities of fossil fuel dependency. On a positive note, it accelerated a more determined commitment towards the transition to renewables. Germany's response is an example to remind us how crises can serve as pivotal moments for energy policy, balancing geopolitical pragmatism with climate goals. The German experience underscores the necessity of embedding resilience into energy and climate policy frameworks. One immediate implication is the need to establish flexible yet binding mechanisms that allow for short-term energy security responses, without permanently compromising climate targets. Policymakers should prioritise scalable investments in renewable infrastructure, supported by long-term subsidies and tax incentives, to ensure clean alternatives remain competitive even during crises.

Additionally, developing strategic reserves of critical materials for renewable technologies and streamlining permit processes can bolster deployment speed. Integrated planning between federal, state, and

⁶⁴ Ministry for, Bundesrat Adopts Draft Legislation Amending the LNG Acceleration Act, Federal Ministry for Economic Affairs and Climate Action, 2023, <https://www.bmwk.de/Redaktion/EN/Pressemitteilung/en/2023/07/20230707-bundesrat-adopts-draft-legislation-amend-ing-the-lng-acceleration-act.html>

municipal authorities is essential, to prevent fragmentation and ensure coordination in response to emergencies. Energy diversification must also be rethought – not just geographically, but technologically – favouring domestic and low-carbon options over transitional fossil fuel dependencies. Ultimately, the war has made it clear that energy policy must be adaptive, forward-looking, and built around sustainability, with robust legislative instruments and financial guarantees to back its ambitions.

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