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G7 POWER SYSTEMS SCORECARD

COUNTRY PROFILE: GERMANY¹

May 2024

Synopsis

OVERALL COUNTRY SCORE: 243/400

Germany scores relatively well across most indicators with an exception for ending fossil fuel dependencies. The latter is the result of historically high shares of coal in the power mix, a decision to phase out nuclear power before fossil power and, most importantly right now, a significant pipeline of new gas plants to provide back-up capacities when coal is phased out. Germany's overall good score is thanks to strong recent growth of variable renewables, and adopted policies to ensure a continuous high growth rate of renewables, grid expansion, improving digitalisation, and investments in renovation. A strong showing in international leadership, together with several EU policies in the area of energy efficiency and standards, as well as the promotion of non-thermal flex under new EU power market rules, further strengthen Germany's score.

Headline message – Benchmarks 1–2 (Section 1: Infrastructure/Energy mix)

SCORE: 52/120

Germany's 53% share of clean sources in the power mix in 2023 is at the high end, despite having phased out nuclear and coming out of a decade-long period of sustained slow growth in renewables. Coal plants that were brought back on-line in response to Russia's weaponising of energy supplies, have again been closed. A complete coal phase-out by 2030 is becoming more likely through a combination of deal-making with utilities and carbon pricing. At the same time Germany still has a significant pipeline of new gas plants to come on-line to provide back-up capacities from 2030 onwards (with a requirement to switch to H₂ between 2035 and 2040), when coal is expected to be phased out and renewables would make up 80% of the power mix.

¹ To see the whole Scorecard, including the scoring methodology, visit <https://www.e3g.org/g7-power-systems-scorecard>



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Headline message – Benchmarks 3–5 (Section 2: Policies/Targets)

SCORE: 191/280

Germany has policies in place for nearly all aspects of power sector decarbonisation. It has a target to triple build-out of solar and wind by 2030 to reach 80% RES-based energy by 2030. It is building out the infrastructure needed to make this happen, such as grid investments, although it still relies heavily on hydrogen-ready gas plants to address intermittency. Newly agreed EU power market rules, under which Germany has committed itself to setting national flexibility objectives and flexibility support schemes focusing on non-thermal options to increase grid flexibility investment, will help reduce this risk if implemented well. Permitting time has come down but remains too high and the pipeline for wind and solar is too small.

Benchmark 1: Reducing fossil fuel reliance

SCORE: 18/60

Germany's strong historical reliance on coal and gas for power generation and its long-standing decision to phase out its existing nuclear fleet before coal means that significant progress in reducing its reliance on fossil fuels only started to be made in the last few years, with most progress being made in phasing out coal from power generation. However, a pipeline of new gas generation capacities, intended to replace coal plants as back-up capacities after 2030, remains a risk factor to delivering a completely fossil free power system.

1.1 New unabated coal and gas power plants in planning or construction

SCORE: 4/15

Although Germany has no new coal infrastructure announced it does have a significant pipeline of new gas plants to be used primarily as back-up and flexibility capacity. The 10 GW of new gas plants are required to be hydrogen ready and are expected to switch to green hydrogen between 2035 and 2040.²

1.2 Share in electricity generation: fossil fuels

SCORE: 6/15

The fossil fuel share has been decreasing significantly over the last few years, to around 40% last year. However, much of the coal generation is planned to be

² BMWK, February 2024, [Einigung zur Kraftwerksstrategie](#)



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replaced with gas fired plants risking long-term fossil fuel lock-in for power generation.

1.3 Share in electricity generation: non-renewable low-carbon tech

SCORE: 2/15

The share of non-renewable low-carbon tech in electricity generation was low at 1% because of a long-standing decision to phase out existing nuclear power.

1.4 Carbon intensity of power index

SCORE: 6/15

The carbon intensity of power index was 58.4 in 2022. Germany has 380.9 gCO₂/kWh in 2023,³ placing it well above the global and G7 average.

Benchmark 2: Ramping up renewables

SCORE: 34/60

As a global pioneer in supporting renewable energy and with especially in the last two years high growth rates Germany now has a relatively high share of renewable generation and has set itself ambitious targets to stay on a strong growth path. In 2023, Germany generated 53.4% of its electricity from renewable sources. Progress has also been made in reducing permitting times, though more efforts are needed to bring those down further and the solar and wind pipeline is still too small.

2.1 Share of variable RES in electricity generation

SCORE: 15/15

Variable renewables made up 44% of generation in 2023: 32% wind energy and 12.1% solar.

2.2 Share of other RES in electricity generation

SCORE: 5/15

Germany has a low share of other RES in generation as a result of a high share of variable RES. Last year, 8.4% of its electricity generation came from biomass and 3.2% came from hydropower and other non-variable renewable sources.

³ Ember, May 2024, [Electricity Data Explorer](#)



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2.3 Variable RES pipeline capacity vs country's announced target

SCORE: 6/15

Targets for the expanding RES capacities are in keeping with the government target of a decarbonised power sector by 2035. Germany aims to roughly double its onshore wind capacity⁴ to 115 GW by 2030, meaning annual capacity additions will have to reach 10 GW as of 2025.

New Solar PV installations will total 22 GW per year as of 2026 to achieve a total capacity of 215 GW by 2030 (400 GW by 2040), up from about 60 GW in 2021. Germany's pipeline for wind makes up 20GW half of which is already in the pre-construction phase, for solar it is 6 GW again evenly split across pre-construction and announced. Overall, this is well below what is needed to achieve its own renewable energy targets.

2.4 Average permitting time for VRE

SCORE: 8/10

Germany has made progress in reducing permitting times and making efforts to reduce these further (helped by EU emergency regulations setting maximum permitting times at 3 months for solar and 6 months for wind). For instance, in the first months of 2023 3.2 GW of new onshore wind projects were approved, a 44% increase from the same period in 2022. However, permitting times are still too high, averaging around 3–5 years.

Benchmark 3: Adapting the power systems to high-RES share

SCORE: 97/120

Germany has taken important steps to adapt its power system to a high share of variable renewables. It has ambitious plans in place to expand its grid, strong support schemes for renewables, and is factoring in increased demand levels from electrification in transport and heating. However, its focus on new gas plants to provide flexibility has been at the expense of non-thermal flexibility. Implementation of new EU power market rules that promote non-thermal flexibility options such as demand response is now an important opportunity to address this.

⁴ Clean Energy Wire, [Glossary – Onshore wind](#) (webpage, accessed May 2024)



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3.1 Policies to limit curtailment to a minimum that ensures optimal RES capacity utilisation

SCORE: 12/15

At 4%,⁵ curtailment rates are still on the high end of IEA recommendations for countries with high levels of RES,⁶ but Germany has and continues to take effective measures to reduce this rate. The government has set a target to reduce curtailment of renewable energy to zero by 2030.

Germany's current high rate is partly due to the inefficient connections between renewables in the north and heavy industry usage in the south of the country. Grid expansions have helped to reduce onshore wind curtailment by 2% since 2015, and solar curtailment is just 1.94%. However, this is undermined by increases in offshore wind curtailment to 8% in 2022 (up from 1% in 2015), and a quarter of offshore wind energy was curtailed in the first quarter of 2023.⁷

Offshore wind curtailment is expected to be much improved by the A-Nord grid connection running from Lower Saxony to North Rhine-Westphalia. Other policies to reduce curtailment include developing energy storage technologies like hydrogen electrolyzers at bottleneck areas on the grid,⁸ and increasing the flexibility of the power system and improving grid optimisation.⁹

Germany is also helping to develop a regional electricity market. This would allow Germany to export excess renewable energy to neighbouring countries when its own grid is congested. TenneT is developing its Nordlink.¹⁰ interconnector transporting mostly wind generated electricity between Germany and Norway to provide more grid stability between the two countries.

⁵ CLEW, 13 December 2022, **Germany curtails four percent of renewable power production due to grid bottlenecks**

⁶ IEA, June 2023, **Renewable Energy Market Update**

⁷ Tagesspiegel Background, October 2023, **Ein Viertel der Offshore-Erzeugung zuletzt abgeregelt**

⁸ NEP Kompakt, 2023, **Netzentwicklungsplan Strom 2037 mit Ausblick 2045, Version 2023, erster Entwurf**

⁹ Bundesnetzagentur, December 2023, **Monitoringbericht**

¹⁰ TenneT, **Nordlink** (Webpage, accessed May 2024)



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3.2 Active steps by the national grid operator to plan for short spells of 100% RE power

SCORE: 15/15

Germany adopted a System Stability Roadmap¹¹ in December 2023. The System Stability Roadmap for the first time outlines a structured path for achieving a secure and resilient system operation with 100% renewable energy sources. Within the roadmap, all necessary processes and process enhancements that are relevant for system stability are identified. For every process it describes a process initiator, actors involved and an implementation period. BMWK (the Ministry for Economic Affairs and Climate Action) and BNetzA (the Federal Network Agency) will support and monitor the implementation of the System Stability Roadmap.

3.3 Effective policies to ramp up electricity storage

SCORE: 12/15

A comprehensive policy framework still missing but certain steps have already been taken, such as a commitment to install 10 GW of battery storage and a power storage strategy¹² was adopted by the end of 2023.

In 2022, Germany agreed on a legal definition of energy storage as part of translating an EU directive¹³ (a reform of electricity market rules adopted in 2019) to German law. This can pave the way for developing a regulatory framework which is currently missing (assessment by the German Energy Storage System Association BVES¹⁴). The law aims to remove bureaucratic obstacles and simplify and accelerate the rapid expansion of energy storage.

According to BSW, the German Solar Association, Germany will need to increase storage capacity from 6.7 GW (early 2023 figures) to 55 GW by 2030.¹⁵ In its coalition agreement, the government committed to installing 10 GW of battery storage. The “Resilience and Sustainability of the Battery Cell Production Ecosystem” funding guideline makes around €1 billion in investment subsidies

¹¹ BMWK, December 2023, **System Stability Roadmap**

¹² BMWK, **Stromspeicher-Strategie des BMWK vorgelegt** (Webpage, accessed May 2024)

¹³ Official Journal of the European Union, 5 June 2019, **Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on Common Rules for the Internal Market for Electricity and Amending Directive 2012/27/EU (recast)**

¹⁴ Cameron Murray, 29 June 2022, **Germany finally gives energy storage its own legal definition**, Energy Storage News

¹⁵ CLEW, 2 March 2023, **Solar power battery installations increase exponentially in Germany**



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available for the entire battery value chain:¹⁶ from raw materials to battery cells and subsequent recycling.

The Renewable Energy Sources Act 2023 (EEG 2023) promotes the idea of using green hydrogen for renewable energy storage. The National Hydrogen Strategy (NWS),¹⁷ published in July 2023, aims to increase electrolysis capabilities to 10 GW (up from previous target of 5.5 GW in the 2020 NWS). However, the new NWS does not mention renewable energy storage in its key targets for hydrogen applications.

3.4 Effective policies to increase end use flexibility

SCORE: 10/15

End use flexibility has not been a major factor in previous discussions around Germany's Power Plant Strategy. However, forthcoming implementation of new EU power market rules will, if implemented ambitiously, be an important step forward.¹⁸

The Power Plant Strategy¹⁹ incentivises the construction of new H₂-ready power plants as part of efforts to decarbonise the German power plant fleet. This will be provided by a combination of 10 GW of hydrogen-ready gas fired power plants and a technology-neutral capacity mechanism by 2028. The gas plants will then switch to hydrogen between 2035 and 2040. The hydrogen could come from green, blue or other low carbon sources. An additional 500 MW of pure hydrogen power plants will be funded as part of an energy research framework. The total costs amount to approx. €15–20 billion over the next 15 years, with funding coming from the Climate and Transformation Fund.

Under recently agreed EU power market rules, Germany has committed itself to setting national flexibility objectives, to be defined by 2026, and flexibility support schemes focusing on non-thermal options to increase grid flexibility investment, enabling grid integration of renewables and less dependence on gas for power systems balancing.

¹⁶ BMWK, 25 September 2023, **Pressemitteilung: Neue Fördermaßnahmen zur Stärkung der Batterie-Wertschöpfungskette**

¹⁷ BMWK, **Die Nationale Wasserstoffstrategie** (Webpage, accessed May 2024)

¹⁸ Pieter de Pous, Artur Patuleia, Vilislava Ivanova, 15 January 2024, **EU Power market reform: a launchpad for deep decarbonisation of EU power**

¹⁹ BMWK, February 2024, **Einigung zur Kraftwerksstrategie**



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3.5 Effective policies to accelerate grid development

SCORE: 12/15

Grid development has been high on the German government's agenda and plans are in place to address bottlenecks and help ensure delivery. However, insufficient progress poses a challenge for net zero in 2035. An integrated strategy for electricity and hydrogen grid development is needed.²⁰

The Scenario Framework²¹ for grid development is drafted each year by German TSOs and then confirmed by BNetzA. This then forms the basis of the Network Development Plan (NDP). The current NDP²² is running from 2023 to 2037/45 and was submitted by German transmission system operators (TSOs) in June 2023.

The Grid Expansion Acceleration Act for the Transmission Grid (NABEG)²³ (first adopted in 2011 and updated in 2023) governs the build out of the German grid in line with needs of renewables technology. An NDP is being developed and regularly revised by the four German TSOs 50Hertz, Amprion, TenneT and TransnetBW.

The Energy Industry Act (EnWG)²⁴ also contains provisions relating to the extension of the grid network and the role of the Bundesnetzagentur in related planning processes. The Electrotechnical Properties Verification Ordinance (NELEV)²⁵ was amended by the BMWK to accelerate the grid connection of renewable plants and to remove certification and planning hurdles.

Hydrogen infrastructure is being considered to help deliver grid flexibility, being seen as key for storage and load-side flexibility. German TSOs have handed in a draft of the core hydrogen network plan²⁶ to the BMWK. This is contributing to the government's own NDP. 50Hertz says of the plan "...bottlenecks in the

²⁰ Agora Energiewende, 23 June 2022, **Klimaneutrales Stromsystem 2035: Wie der deutsche Stromsektor bis zum Jahr 2035 klimaneutral werden kann**

²¹ Bundesnetzagentur, **Szenariorahmen** (Webpage, accessed May 2024)

²² **Netzentwicklungsplan Strom** (Webpage, accessed May 2024)

²³ Bundesnetzagentur, **Netzausbaubeschleunigungsgesetz Übertragungsnetz (NABEG)** (Webpage, accessed May 2024)

²⁴ Bundesnetzagentur, **Ausbau der Stromübertragungsnetze** (Webpage, accessed May 2024)

²⁵ BMWK, 13 September 2023, **Pressemitteilung: Beschleunigung von Netzanschlüssen für Erneuerbare-Energien-Anlagen im Kabinett beschlossen**

²⁶ BMWK, 12 July 2023, **Pressemitteilung: Fernleitungsnetzbetreiber veröffentlichen Planungsstand für deutschlandweites Wasserstoff-Kernnetz – Erster wichtiger Schritt für die künftige Wasserstoff-Infrastruktur**



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transmission grid can be minimized and the curtailment of renewable energies can be reduced during periods of high feed-in”.²⁷

3.6 Effective policies to enable the required digitalisation of power systems

SCORE: 9/15

Policies are in place and are currently being updated as hurdles persists such as slow technology rollout and integration of end consumers.

An important step forward was made in May 2023 with the adoption of a law to “restart the digitalisation of energy systems”²⁸ amending already existing energy related legislation. An assessment by researchers at Fraunhofer Institute²⁹ however also found that more clarity was needed on goals being pursued, digital competences needed to be improved and more investments in the digitalisation of energy systems was needed.

3.7 Effective mechanisms or frameworks to prevent preferential treatment for fossil fuel-based generation over RES on the market

SCORE: 14/15

Renewables continue to enjoy the support of policies and regulations though more could be done to promote renewables over fossil fuels when designing grid fee structures.

The EEG law has been the bedrock of preferential treatment of renewable energy. It was introduced in 2000, and generally updated in 2023 as EEG 2023 (with the most recent changes in May 2024). An originally included surcharge charged directly to consumers was scrapped in 2022 as part of the measures to ease the cost-of-living crisis caused by rising energy costs. However, the law still has many elements that will support RES build out over fossils.

The EEG stipulates that the construction and operation of renewable energy systems is in the “overriding public interest” and “serves public safety”. This strengthens RES legally and politically but also increases the risk of green-on-green conflict as it implies that RES build out will take priority over concerns about, for example, nature conservation.

²⁷ Netzentwicklungsplan, 23 March 2023, [Pressemitteilung: Übertragungsnetzbetreiber veröffentlichen ersten Entwurf des Netzentwicklungsplans 2037/20](#)

²⁸ Bundesgesetzblatt, 26 May 2023, [Gesetz zum Neustart der Digitalisierung der Energiewende](#)

²⁹ Fraunhofer BINES, 20 February 2024, [Fortschrittsbericht Digitalisierung des Energiesystems](#)



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Under the EEG, a feed-in tariff for RES was introduced in 2000, when RES made up 6% of electricity generation. The tariff fixed the price of RES so that investors could ensure a secure return on investments. It helped drive down the cost of RES and made them more competitive with fossil fuels. EEG23 has increased the remuneration of the feed-in tariff for both private household solar and larger solar installations. Analysts are confident that this will keep solar installations on a bearish growth path. In 2023 14 GW of new solar was added to the grid, more than was expected or targeted by the government.

Grid fees: There is ongoing debate over whether to split Germany up into different energy price zones that would favour regions with high shares of RES versus those with lower shares. Germany produces a lot of RES in the north and consumes a lot of energy in the south and west. Currently those RES-producing areas are also taking on the costs of adding the wind energy into the grid. There are calls to even out these costs to incentivise RES build out in regions that have historically been weak on RES.

3.8 Electrification rate target and roadmap to support delivery

RANKING: 13/15

Germany's renewable energy law includes ambitious assumptions about electrification rates, especially in heating and transport, and has policies in place to support those.

Benchmark 4: Governance / International leadership

SCORE: 50/80

Germany's involvement including financial commitment to several key diplomatic initiatives supporting the global energy transition makes it a strong leader in the global energy transition. Recent progress in advancing its domestic coal phase-out commitment and boosting its ambition to RES are ensuring it has some credibility to do so, but this is undermined at the same time by its continuous effort to overcompensate for the loss of Russian gas imports.

4.1 2035 carbon neutral power system commitment adopted in national legislation?

SCORE: 9/10

Germany was a driving force behind the G7 commitment to "fully or predominantly decarbonized electricity sectors by 2035" and has committed to



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be net zero by 2045. A commitment to achieve a fossil free power sector by 2035 did not make it into the latest revision of Germany's EEG, but the renewable energy targets Germany has set itself for 2030 will effectively deliver a clean power sector by 2035. And at the end of 2023, Germany was among seven EU countries who committed to work together to establish a decarbonised power sector by 2035 following an initiative by the Dutch government in the Pentalateral Energy Forum.

4.2 Global leadership on supporting power systems decarbonisation in developing countries

SCORE: 7/10

Germany has been an active player in key energy related initiatives, having been for example the largest contributor of concessional and grant finance among the international donor group of countries supporting Just Energy Transition Partnerships (JETPs). Its leadership is however undermined by its efforts to overcompensate for the loss of Russian gas imports and plan the construction of new gas plants. Germany's contributions include:

- > A strong international leadership role and significant engagement to support energy transition in developing countries.
- > Significant contributor to international climate finance: €5.34 billion in 2021.³⁰
- > An active partner in the JETPs with South Africa,³¹ Indonesia,³² and Vietnam,³³ and one of the few IPG governments who was able to support them with significant amounts of grant and concessional finance.
- > Bilateral energy partnerships with Algeria, Brazil, Chile, China, India, Morocco, Mexico, Tunisia through the Ministry for Economy and Climate Action.³⁴
- > Bilateral climate and development partnerships (P+) with Pakistan, Serbia, Rwanda, India and Peru through the Ministry for Economic Cooperation.³⁵

³⁰ BMZ, **Climate finance: Germany remains a reliable partner** (Webpage, accessed May 2024)

³¹ European Commission, 2 November 2021, **France, Germany, UK, US and EU launch ground-breaking International Just Energy Transition Partnership with South Africa**

³² European Commission, 15 November 2022, **The EU and International Partners launch ground-breaking Just Energy Transition Partnership with Indonesia**

³³ BMZ, 14 December 2022, **Just Energy Transition Partnership (JETP) with Viet Nam**

³⁴ BMWK, **Climate, energy and hydrogen partnerships and energy dialogues** (Webpage, accessed May 2024)

³⁵ BMZ, **Climate and development partnerships** (Webpage, accessed May 2024)

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- > Signatory to the Glasgow Coal to Clean Power Transition Initiative.
 - > Donor government to the Energy Transition Council (ETC).

4.3 International commitments on power systems decarbonisation through alliances or networks such as the PPCA, Glasgow Coal to Clean Power Initiative etc.

SCORE: 8/10

Germany was a relatively early member of the PPCA and is an active supporter of its work but its membership was initially contingent on being able to commit to a coal phase-out by 2038 at first. Significant effort is being made since to move this date forward to 2030. Germany is also a member of the Glasgow Coal to Clean Power Transition Initiative.

4.4 Net zero power system roadmap to drive delivery of 2035 commitment

SCORE: 5/10

There is no explicit net zero power sector delivery roadmap in place. However, a political roadmap to net zero was reaffirmed by Chancellor Scholz at World Economic Forum meetings in Davos in 2023.

4.5 Critical role of renewables, interconnection, and demand side measures reflected in country's energy security framework?

SCORE: 6/10

Although there are tensions between short-term emergency diversification of fossil fuel sources to reduce the economic impacts of high gas prices, and medium-term measures to accelerate the energy transition, energy security has become a key consideration in recent policy making in support of renewables, interconnections and demand side measures.

4.6 Unabated coal phase-out date and roadmap to support delivery

SCORE: 5/10

Formally, Germany's federal coal phase-out of 2038 is still in place. However, coal exit is not likely to be a barrier to net zero power by 2035.

The government has already brought phase-out of lignite fired coal plants in the western German coal region North Rhine-Westphalia forward to 2030 in a deal with state government and energy company RWE. Similar efforts are now under way in coal region Lusatia in Germany's East.



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The current government said in their coalition agreement that they wanted to bring the coal phase-out date forward to 2030, if possible. The ongoing negotiations combined with the economic impact of a revised Emissions Trading System (ETS) has made this increasingly likely.

4.7 Unabated gas phase-out date and roadmap to support delivery

SCORE: 0/10

Germany not only has no date or trajectory in place for phasing out gas in power generation, but is in fact planning to build at least 10 GW of new plants to replace coal as providing back-up capacity.

4.8 2030 target for share of total RES in electricity generation

SCORE: 10/10

Germany has a target of 80% RES in the power sector by 2030. This is a strong commitment, but more robust policies are needed to speed up the build out of RES in the coming years.

Benchmark 5: Reducing energy waste

SCORE: 44/80

Thanks to a combination of regulatory instruments, especially at EU level, and domestic funding instruments, Germany is taking steps towards eliminating energy waste. However, more needs to be done.

5.1 Efficient policies to retrofit / renovate buildings

SCORE: 5/20

Germany has several policies and financing programmes in place that support deep renovation but has so far not been able to increase renovation rates to the speed needed.

- > German Buildings Energy Act (Gebäudeenergiegesetz, GEG): issues energy performance certificates and governs the requirements of the use of renewable energy in buildings³⁶.
- > Bundesförderung für effiziente Gebäude (BEG): financial support for implementation of the GEG: supports energy efficiency and renewable energies in the building sector in Germany. Created in 2021. Supports up to

³⁶ BMWBSB, **Gebäudeenergiegesetz (GEG)** (Webpage, accessed May 2024)



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50% of the expert planning, up to 20% construction support of single efficiency measures, up to 45% for systemic renovation, (up to 70% for new renewable heating systems (including heat pumps and biomass heating systems) and heating optimisation.³⁷

- > Germany is also bound to improve building efficiency by the EU Energy Performance Buildings Directive (EPBD) and the Energy Efficiency Directive (EED).³⁸ These directives aim to reduce emissions in the building sector across Europe by 60% by 2030 compared with 1990 levels.
- > Germany currently does not have a binding retrofitting target. DIW have argued that Germany needs a retrofitting target of no less than 4% a year to keep up with emissions reduction targets across the EU and in Germany.³⁹ The current rate of retrofitting per year is around 1%. This has stagnated since 2010. DIW argues that Germany does not have enough support programs and investment at the moment to support a higher retrofitting rate.

5.2 National energy/power savings target

SCORE: 15/20

Following implementation of the EU's Energy Efficiency Directive in 2023, Germany's Energy Efficiency Act (April 2023) implements the key requirements of the directive in Germany to reduce primary and final energy consumption. It lays out binding energy efficiency targets for 2030, notably to reduce final energy consumption by more than 550 TWh (26.5%) compared to 2008.⁴⁰ Other key targets include:

- > Primary energy reduction of 39% compared to 2008 by 2030 (which slightly exceeds the EED target).
- > Annual energy savings of 45 TWh by Federal government and 5 TWh at state government level by 2030.
- > Companies with annual energy consumption over 15 GWh required to implement energy management systems and document energy efficiency

³⁷ BAFA, **Bundesförderung für effiziente Gebäude: Förderprogramm im Überblick**

³⁸ European Commission, **Energy Performance of Buildings Directive** (Webpage, accessed May 2024)

³⁹ DIW Berlin, 13 March 2023, **Accelerate thermal modernization of buildings with minimum standards for buildings and binding retrofitting targets**

⁴⁰ Bundesregierung, 19 April 2023, **Energy Efficiency Act: The public sector set to become a role model**



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measures. Required to avoid waste heat during production or to make effective use of the waste heat.

- > Standards for energy efficiency in new data centres. Mandating use of waste heat and economical use of cooling system power.

5.3 Sufficient spending on energy efficiency programmes

SCORE: 8/20

Germany has two financial instruments in place to support renovations but at current levels these are insufficient to achieve needed renovation rates.

- > Bundesförderung für effiziente Gebäude (BEG): 2022 budget was €4.457 billion (up from €2.775 billion in 2021): €1 billion on new buildings and €3.457 billion on retrofits. 2023 budget (agreed in March 2023) was €5.2 billion.⁴¹
- > Climate and Transformation Fund (KTF): from 2024 to 2027 a total of €211.8 billion to be invested in total. €18.9 billion has been earmarked for retrofitting and energy efficiency for new buildings.⁴²

5.4 High-quality appliance and equipment standards and labelling

SCORE: 16/20

Through the transposition of EU labelling and standards instruments, Germany has policies in place to promote energy efficient appliances.

Appliance and equipment standards

- > EU Ecodesign Directive (2009) covers 31 product groups and according to the EU saved consumers €120 billion in energy costs and lessened energy consumption by 10%. These cover mainly energy related products.⁴³
- > A proposal for a new Ecodesign for Sustainable Products Regulation (ESPR) was originally published in March 2022. It builds on the Ecodesign Directive to incorporate more metrics on circular economy of products.⁴⁴

⁴¹ BAFA, **Bundesförderung für effiziente Gebäude: Förderprogramm im Überblick**

⁴² Bundesregierung, 9 August 2023, **Milliardeninvestitionen in Energiewende, Klimaschutz und Transformation**

⁴³ Official Journal of the European Union, 21 October 2009, **Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products (recast)**

⁴⁴ European Commission, **Ecodesign for Sustainable Products Regulation** (Webpage, accessed May 2024)



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- > Refrigerators and freezers, washing machines and dishwashers, tumble dryers, televisions, light bulbs, air conditioners and boilers require energy efficiency class labels in Germany.

Labelling

- > Energy Performance Certificates (EPCs) were brought in by the EPBD at the European level. They measure the energy efficiency of buildings in the EU.⁴⁵
- > EU Energy Efficiency class label indicates the energy efficiency of consumer products and appliances and has a QR for more information on the product. All labelled products are on the EPREL EU database. The boundaries between classes A–G are determined by the EU Framework Regulation 2017/1369.⁴⁶
- > Blue Angel (Blauer Engel) Eco Label has been around for 45 years and is used to distinguish products that are environmentally friendly. It is a voluntary label that is used as a best in class for German products.⁴⁷
- > Efficiency House Seal of Approval from German Energy Agency DENA is a voluntary label designed to help buyers recognise a building as energy efficient when going to look at it for the first time. Around since 2009.⁴⁸

⁴⁵ Heinrich Böll Stiftung, 3 April 2022, **What are Energy Performance Certificates (EPCs) and what is their status in Germany?**

⁴⁶ European Commission, **Ecodesign and Energy Label** (Webpage, accessed May 2024)

⁴⁷ **Blauer Engel: Ecolabel history** (Webpage, accessed May 2024)

⁴⁸ Ökologisch Bauen, **DENA führt Effizienzhaus Gütesiegel ein** (Webpage, accessed May 2024)



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E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

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