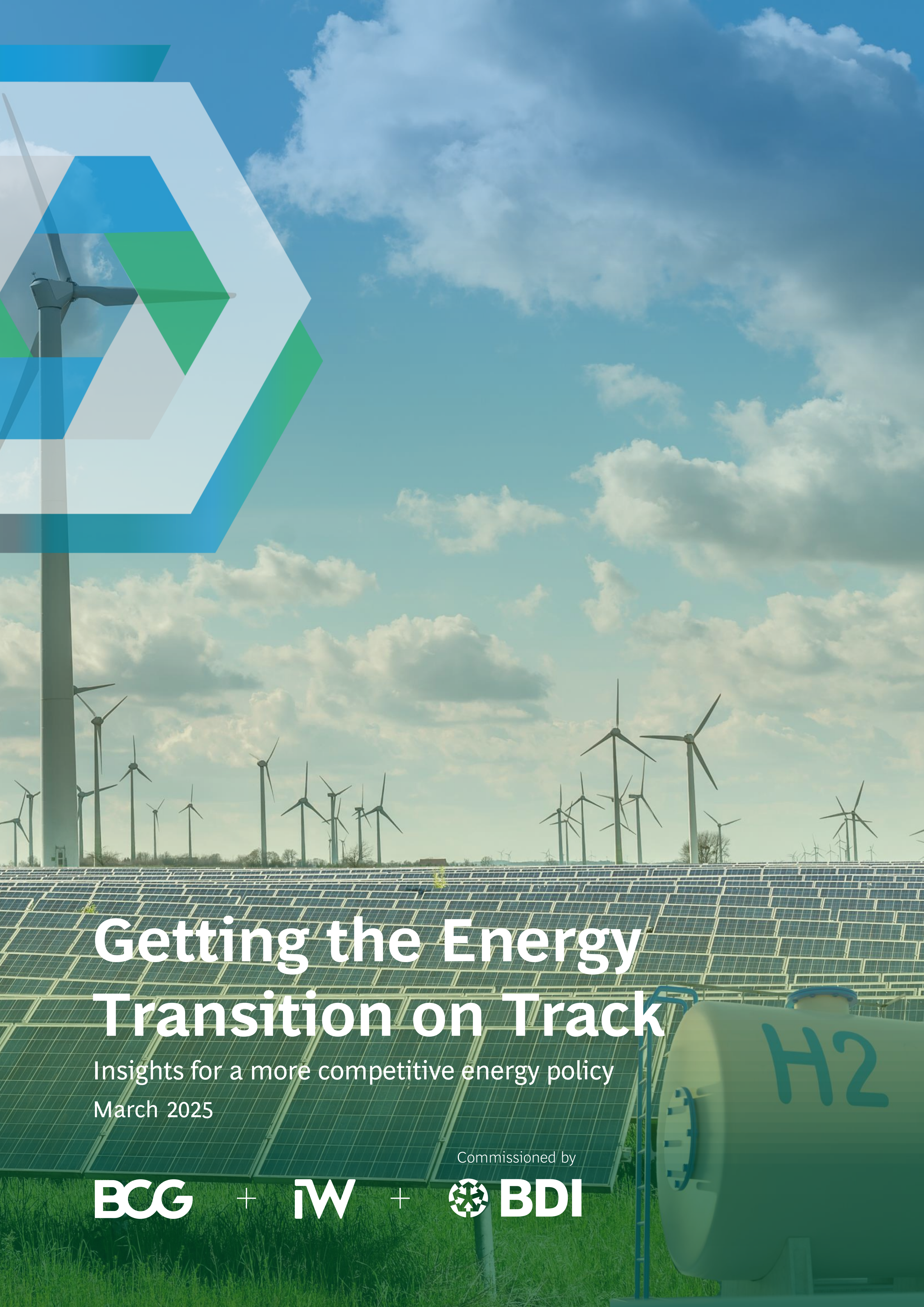

Getting the Energy Transition on Track

Insights for a more competitive energy policy

March 2025

Commissioned by

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The Federation of German Industries (BDI) is the leading organization for German industry and industry-related service providers. Representing 39 industry associations, 15 regional offices, and more than 100,000 companies employing around eight million people, the BDI is the voice of the German industry. It advocates for a modern, sustainable, and successful industrial sector in Germany, Europe, and worldwide.

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Key statements

1

Germany has an energy cost problem. The energy crisis of recent years exacerbated the already existing cost disadvantage of German industry and triggered a noticeable decline in production, particularly in energy-intensive sectors. Although energy prices have eased again compared to the crisis year 2022,[1] gas prices for Germany's industrial consumers are still five times higher and electricity prices, at least in some sectors, up to two and a half times higher than those of major geopolitical competitors.

2

One reason: In its current form, the energy transition is very expensive. The energy transition has so far mainly taken place with regard to electricity, where it has caused around half of the 70% increase in electricity system costs since 2010. Further cost increases resulting from future mismanagement are also possible. On one hand, the expansion of the electricity grid, renewables, and hydrogen is being planned with too little regard for actually foreseeable demand, and on the other, current planning is often based on unnecessarily costly solutions such as electricity generation from green hydrogen in gas-fired power plants. Energy costs for industry are threatening to rise even more sharply, as companies switch from fossil natural gas to relatively more expensive electricity or even more expensive hydrogen in order to achieve climate targets.

3

The electricity transition can be achieved more cost-efficiently—and could even bring specific electricity system costs back down. Transitioning to electricity produced with renewable generation will be necessary to reduce emissions. This also presents an opportunity for better energy prices, as smarter implementation could lead to sustainably reduced and significantly lower specific electricity costs in the long term (25% less by 2035 compared to now). However, this will require considerably improved coordination in the expansion of electrification, renewables, and infrastructure, in addition to a stronger overall focus on cost efficiency—including in particular

- the modification of planned infrastructure and renewable investments for electricity demand that is foreseeably at least 100 TWh lower (by 2030, compared to current planning);
- substantially accelerated electrification in road transport and a switch to heat pumps in buildings and electric industrial heating to reduce the risks of an underutilized electricity system;
- greater emphasis on security of supply and flexibility, with rapid expansion of secured capacity and more flexible demand (where technically and economically possible) to avoid the prohibitive cost of shortage situations on the electricity market;
- avoidance of unnecessarily high costs, such as from the premature use of expensive "last mile" levers like the conversion of hydrogen to electricity, from inefficient grid expansion, or from a high share of relatively expensive technologies in the renewables mix for electricity generation;
- smarter transformation management, e.g., with stronger regional incentives for renewables, storage, and consumption, with the integration of renewables in a more system-friendly way, and with stronger European cooperation; and
- wider option space for the decarbonization of backup power plants for the "last mile," with lower-cost solutions such as batteries, biogenic energy sources, and carbon capture and storage (CCS).

[1] Costs in January and February 2025 were again above the 2024 level.

4

Hydrogen will remain costly in the foreseeable future, but can be sourced for less than currently planned. Germany's industry needs green molecules to achieve zero emissions. However, it is foreseeable that hydrogen, in particular, will be several times more expensive than alternatives in many applications. To avoid unnecessary costs, currently highly ambitious plans for developing a hydrogen economy in Germany should be rethought for the economic reality, with the installation and development of modified infrastructure more in line with actual future demand. In parallel, the availability of the lowest-cost alternatives should be maximized (e.g., imports, blue hydrogen, a more system-friendly use of biogenic energy sources, and CCS)—all while maintaining a commitment to hydrogen as a growth area for German industry.

5

A more cost-efficient energy transition could save more than €300 billion by 2035 compared to current political planning. A more cost-efficient energy transition using the approaches described above could save around €370 billion in investments and €330 billion in energy system costs[2] by 2035 (see Figure 1). This would keep electricity prices lower for most consumers, e.g., by up to €600/year for a household of four. For industry, the total savings could be as much as €11 billion by 2035.

6

Some industries and industrial applications will still be threatened. Even with a more cost-efficient energy transition, electricity-intensive sectors—and others—will need permanent relief on a scale largely similar to today (or even greater, in some cases) in order to remain internationally competitive. The electrification of industrial heat applications should be given greater support to put electricity on a par with natural gas as an energy source, and public support will need to be provided for the ramp-up of the hydrogen economy. During the transformation, natural gas will remain at a cost disadvantage for the industry as a whole in international comparison. This will be exacerbated in future by increasing CO_2 prices. Policymakers should therefore steer away from avoidable additional burdens on industry, such as the high cost of gas storage. Finally, an effective and simple carbon leakage protection scheme should be put in place for vulnerable industries that will be affected by high CO_2 costs.[3]

7

Drastically lowering existing expansion targets would jeopardize Germany's industrial growth in future-oriented sectors. Energy transition technologies are one of the biggest future growth and investment drivers for industry and therefore also of central importance in terms of industrial policy. To compete internationally, manufacturers in Germany and Europe need strong domestic markets. In the best case, investments should therefore be stabilized at a higher level than in the past. In the worst case, Germany will oversteer in the opposite direction, damaging one of the most important growth areas of its industry and thus contributing to the risk of future deindustrialization.

8

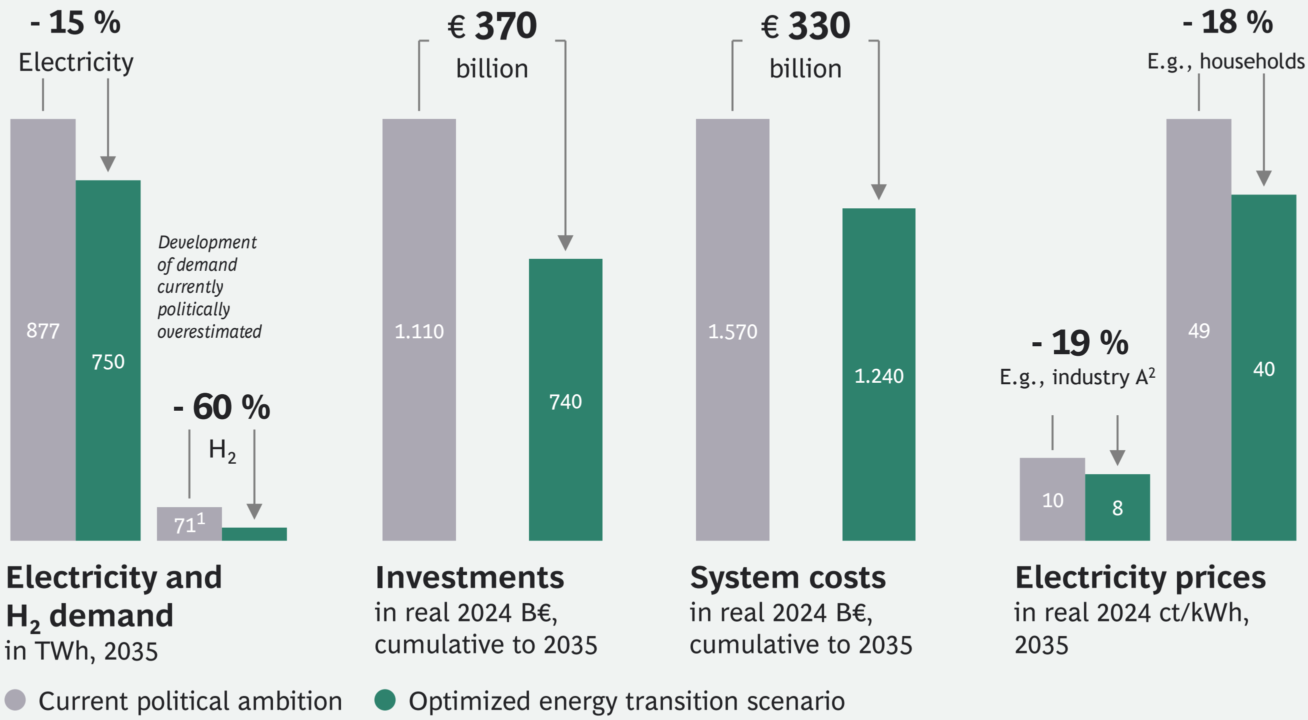
Germany as a business location needs a new energy program now. The cost-efficient implementation of the energy transition, simultaneously boosting both decarbonization and growth opportunities for German industry, will require a number of policy changes (see Figure 2). Current highly ambitious and costly plans should be revised to address real demand and cost developments, efficiency potential in the electricity transition should be leveraged, and major cost risks should be limited. Furthermore, policymakers should reduce the costs of the molecule transition by maximizing the availability of more cost-effective alternatives, in addition to addressing inefficient industrial decarbonization and remaining concerns in energy-intensive sectors. Political commitment to the energy transition, along with accelerated electrification, growth of renewables and build-up of the hydrogen economy, can secure a strong domestic market and predictable expansion paths for industry in Germany.

[2] Energy system costs are comprised of annuitized investments, as well as energy and other operating costs, and refer to electricity and H_2 systems.

[3] This includes reviewing its effectiveness and developing further the existing CBAM (see BCG & IW & BDI [2024]), as well as solutions for particularly vulnerable industrial sectors that will become part of ETS-2.

The energy transition holds considerable savings potential

FIGURE 1 | Overview of current political ambition and an optimized energy transition scenario



1. 71 TWh in T45 electricity scenario; T45-H2 scenario assumes demand of up to 235 TWh 2. Electricity-intense industry example with typical energy consumption of 4500 GWh p.a., electricity cost intensity of over 20%, and 8,000 h p.a. of full load, receiving maximum grid fee relief in addition to electricity price compensation, and connected to the maximum-voltage electricity grid
Source: Aurora (2024); NEP (2024); KO.NEP (2024); BCG

20 levers for an affordable energy transition

FIGURE 2 | Overview of key levers for an affordable energy transition

Electricity		Molecules
Align (infrastructure) planning with reality		
01 Realistically step up RE & grid expansion	**02** Calibrate H_2 ambition with real costs	**03** Plan H_2 core network based on demand
Avoid major cost risks	Transition electricity cost-efficiently	Reduce costs of molecule transition
04 Further accelerate electrification	**08** Expand grids more cost-effectively	**12** Diversify H_2 sourcing
05 Increase secured capacity	**09** Prioritize lower-cost renewables	**13** Secure availability of biogenic energies
06 Limit redispatch	**10** Make RE more system-friendly	**14** Enable CCUS and build CO_2 network
07 Stimulate flexible demand	**11** Keep "last mile" options open	**15** Avoid unnecessary burdens on natural gas
16 Think European for the energy transition		
Address remaining concerns and additional costs		
17 Maintain and widen electricity cost relief	**18** Support industrial electrification	**19** Close cost gap in industrial decarbonization
20 Strengthen commitment to the energy transition and ensure security of investments		

RE = renewable energies, CCUS = carbon capture, utilization, and storage
Source: BCG

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