

## BULGARIA'S PATH TO GREEN INDUSTRIAL GROWTH

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Europe's sustainable energy transition has been considerably complicated by the global geoeconomics rupture. Trade fragmentation, geopolitical chokepoints, and supply chain disruptions are reshaping access to critical technologies and raw materials, while intensifying competition between the EU, the United States, and China. For smaller, open economies, which are geoeconomics policy takers, such as Bulgaria and all individual EU countries, these shifts present a serious strategic risk if member states fail to secure integrated emerging European clean technology value chains and fall behind in the AI tech competition, adoption and diffusion.<sup>1</sup>

Bulgaria's energy transition is anchored in a robust EU policy framework. Binding climate targets, market rules, and conditional funding instruments provide a stable direction towards decarbonisation. Yet, with geoeconomics pressures increasing EU frameworks shift, and require much more flexible and agile Bulgarian policy responses to secure the country's full potential for integration and growth in secure green industrial supply chains. The pace and quality of the transition will ultimately depend on domestic capacity: the ability to modernise infrastructure, develop industrial capabilities, mobilise investment, and address growing labour and governance constraints.<sup>2</sup>

While Bulgaria possesses important industrial comparative advantages, notably in electrical equipment manufacturing, copper processing, and digital services, its transition remains constrained by a lack of strategic coordination, weak domestic innovation policy, and persistent infrastructure bottlenecks. Continuing

### KEY POINTS

- **EU policy framework** anchors Bulgaria's decarbonisation path, but **weak energy innovation capacity** limits effective implementation.
- **Global supply chain risks** increasingly shape Bulgaria's energy transition. While **solar and battery deployment** has reduced emissions, dependence on **imported technologies** creates vulnerabilities amid growing geoeconomic competition.
- Bulgaria has strong industrial advantages in **electrical equipment, copper processing, and digital services**, but lacks a coherent strategy and **innovation support** to secure green value chains.
- **AI-driven data centres** are emerging as a major source of demand for **low-carbon power** and critical materials. **Faster grid connections** and **reliable low-carbon electricity** are essential to capture AI growth opportunities.
- **Grid bottlenecks, weak digitalisation, labour shortages, skills gaps, energy poverty, and climate-related shocks** are becoming the main barriers to a successful transition.

market distortions due to delayed structural reforms, regulatory uncertainty and administrative inefficiencies have slowed down the deployment of cutting-edge, low-carbon technologies and kept Bulgaria outside the OECD front-runners in capturing AI investment and growth opportunities.<sup>3</sup>

<sup>1</sup> Vladimirov, M., Koeppen, M., and Rickles, M., *Energy and Climate Security in Europe: From Crisis Response to Structural Transformation*, Sofia: Center for the Study of Democracy, 2025.

<sup>2</sup> Gantcheva, N. et al., *Future Resilience: Building Bulgaria's Path to Clean Growth, Industrial Competitiveness and Economic Security*, Sofia: Center for the Study of Democracy, 2025.

<sup>3</sup> Stefanov, R. et al., *Innovation.bg 2025*, Sofia: Applied Research and Communications Fund, 2025.

**Table 1. Policy Framework for Advancing the Energy Transition**

| Framework / Instrument                                   | Policy Measures                                                                                                    |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| National Energy and Climate Plan (NECP)                  | RES expansion, storage, reliance on natural gas as a “bridge fuel”, limited innovation details                     |
| Bulgaria 2030 Strategy                                   | R&D centres, digital & green industry enabling conditions                                                          |
| National Recovery and Resilience Plan (RRP) <sup>8</sup> | Electrolysers, hydrogen valley, RES + storage tenders, building renovation, industrial parks                       |
| Investment Promotion Act (IPA)                           | Export-oriented industrial incentives, skills investment, expedited permitting, tax benefits for foreign investors |
| Innovation Strategy for Smart Specialisation (ISIS)      | Support for clean-tech SMEs, tech transfer, and export capabilities                                                |
| Hydrogen Roadmap                                         | Multilevel hydrogen governance & IPCEI alignment                                                                   |
| Sofia Sustainable Energy and Climate Plan (SECAP)        | Sub-national demand creation, building stock renovation, green mobility procurement                                |

**Source:** CSD based on national and sub-national strategic documents.

Bulgaria’s exposure to the global supply chains has created enormous vulnerabilities. The heavy reliance on non-OECD technologies and supply chains, particularly from China, increases the risks to ever more likely geoeconomics disruptions.<sup>4</sup> Bulgaria’s competitiveness in the sector of upstream materials and intermediate manufacturing have built up the foundation for deeper integration into secure European clean-tech supply chains, if supported by a more targeted and strategic AI, tech and innovation policy.

This brief highlights the growing importance of structural constraints beyond technology and finance. Climate-related shocks, including droughts, heatwaves, and flooding, are already affecting energy systems and industrial productivity. Demographic decline, labour shortages, and weak public trust remain critical bottlenecks that have continuously been slowing down the transition, even where funding and technologies are abundantly available. These factors will determine whether Bulgaria can successfully leverage its industrial strengths and EU integration to become a competitive player in the clean-tech economy. Or whether it remains primarily a technology importer with limited value creation.

## A Transition Anchored in EU, Not Domestic Strategy

Bulgaria’s energy transition policy has been supported by a stable and robust legal, administrative and financial framework, which has been driven and anchored by EU policy shifts. The National Energy and Climate Plan (NECP) has established nationally defined policy priorities and transition timeframes for the EU’s legal-

ly binding 2030 and 2050 climate and energy objectives.<sup>5</sup> The different components of this EU-defined and nationally-deployed framework have also created a level of regulatory stability. Yet, internal political instability and voter discontent with the transition have kept implementation haphazard, reducing foreign and local private sector investment.

The NECP has established 2030 renewable energy targets of 34.48% of gross final energy consumption and 55.51% of electricity generation. To improve energy efficiency, Bulgaria will also aim to achieve 6.23 million tonnes of oil equivalent in cumulative final energy savings for the period 2021–2030 which is in line with the EU-wide reference scenario’s objective of a 10.7% reduction in final energy consumption by 2030. The Bulgarian NECP further explicitly states that if all planned national and EU policies are implemented, net GHG emissions in 2030 would decrease by 82% compared to 1988, exceeding the EU’s 55% target, and reach net zero in 2050.<sup>6,7</sup>

The primary national financing instrument for Bulgaria’s energy transition is the Electricity System Security Fund (ESSF), which sources its revenues from the sale

<sup>5</sup> Council of Ministers and Ministry of Environment and Water of Bulgaria, Climate Change Mitigation Act, 4 July 2015.

<sup>6</sup> Ministry of Energy of Bulgaria, National Energy and Climate Plan of the Republic of Bulgaria (updated draft), 15 January 2025.

<sup>7</sup> European Commission, Renewable Energy Directive (recast 2023); Energy Efficiency Directive (recast 2023); Effort Sharing Regulation (as amended 2023); LULUCF Regulation (as amended 2023); European Commission guidance on NECP contributions.

<sup>8</sup> The Recovery and Resilience Plan (RRP) provides concrete industrialisation and supply-chain support aligned with the EU Green Deal Industrial Plan and Net-Zero Industry Act. RRP investment plans – including 55 MW of electrolysers, a hydrogen valley in Stara Zagora, renewable energy and storage tenders, building renovation programs, and industrial park upgrades – establish procurement opportunities for domestic and foreign investors. These measures aim to support diversification away from non-EU technology dependence and to foster innovation in key sectors.

<sup>4</sup> Vladimirov, M., Gantcheva, N., and Koeppen, M., *Beyond Diversification: Energy Security through Structural Change in Central and Eastern Europe*, Sofia: Center for the Study of Democracy, 2026.

of surplus EU Emissions Trading System (ETS) quotas and from levies on the revenues of power producers and transmission operators. Although the Fund is designed to support renewable energy deployment, high-efficiency cogeneration, and price stability for consumers,<sup>9</sup> in practice, the ESSF has been widely used as a mechanism to subsidise residential electricity prices, provide capacity payments to coal power plants and deploy a price ceiling (subsidies) for industrial electricity consumers, distorting the market and stimulating excessive consumption patterns.<sup>10</sup> As a result, the ESSF has so far effectively been politically mis-used to protect the existing market structure, effectively delaying the process of power market liberalisation indefinitely, and weakening the incentives for investment in low-carbon and energy efficiency technologies.<sup>11</sup>

The EU's Recovery and Resilience Facility (RRF) has allocated approximately €6.17 billion in grants to Bulgaria. Of this, approximately half is earmarked for climate-related reforms and investments. Disbursement is strictly conditional on the implementation of agreed reform milestones.<sup>12</sup> Following strong internal political pressures, successive Bulgarian governments have effectively diluted the reform process, eliminating Bulgaria's central policy commitment to a coal phaseout by 2030. The current 2038 coal phaseout roadmap will allow Bulgaria to continue subsidising coal up to a 10 million metric tons of CO<sub>2</sub> emissions cap, locking in coal-fired power generation at the current rate of around 25-30% of power generation.<sup>13</sup> Successive cabinets have also failed to democratize the renewable energy regulatory framework, by refusing to provide incentives to small-scale decentralised RES-based power generation and the development of onshore and offshore wind energy parks, concentrating transition benefits to few well-connected, large-scale incumbents. This is created conditions for manipulated voter backlash against EU's green policies, as energy poor communities have been left out of the bulk of EU subsidies and hefty corporate profits.

## Security of Supply Chains and New Growth Opportunities

Bulgaria's energy transition process has accelerated despite continued headwinds from internal political fragmentation and the disruption of global supply chains, amid intensifying geoeconomics competition.

A central vulnerability lies in the import dependence on China-bound **solar panels and batteries supply chains**. Installed solar capacity in Bulgaria more than quadrupled from 1.27 GW in 2021 to an estimated 7 GW by the end of 2026. The solar expansion has resulted in a 53% drop in coal-based electricity generation and a corresponding 50% reduction in power sector emissions over the same period. Yet, **84% of all solar panels in Bulgaria are imported from China**, making Bulgaria the second-most dependent EU member state on Chinese PV components when measured relative to GDP. China controls up to **95% of global solar panel manufacturing capacity**, meaning Bulgaria would face immediate price and availability pressures under tariff escalation, export restrictions, sanctions, or shipping disruptions.

Bulgaria is also rapidly adopting battery storage technologies, with 2.13 GW of installed battery capacity already deployed and a pipeline of new projects capable of delivering 12 GW of power and storing 34 GWh of electricity awaiting grid permits. The country benefits from around 1800 sunshine hours per annum, and a relatively large spread between peak and off-peak electricity prices, making Bulgaria highly attractive for investments in solar installations paired with battery storage. A new battery energy storage system (BESS) assembly plant was opened in Sofia in 2025 with an annual capacity of 1.5 GWh. However, the lithium cells, which are utilised for BESS continue to be sourced from China. Practically, all BESS equipment that is being installed in Bulgaria at the moment is imported from China.

Bulgaria's energy transition also depends heavily on the global supply chains for critical raw materials (CRMs), used in solar panels, batteries, electric vehicles, and other clean technologies due to limited CRM reserves in the country itself and insufficient integration in OECD supply chains. Ensuring the access to these CRMs is of strategic importance for securing decarbonisation efforts. Bulgaria depends on imports for most CRMs and semi-processed metals, yet holds substantial domestic copper reserves and processing capacity that could strengthen its industrial base and play a structural role in the EU value chains.

<sup>9</sup> Ministry of Energy of Bulgaria, Climate Change Mitigation Act and secondary legislation on the use of ETS auction proceeds; Explanatory notes on the Fund for Security of the Electricity System.

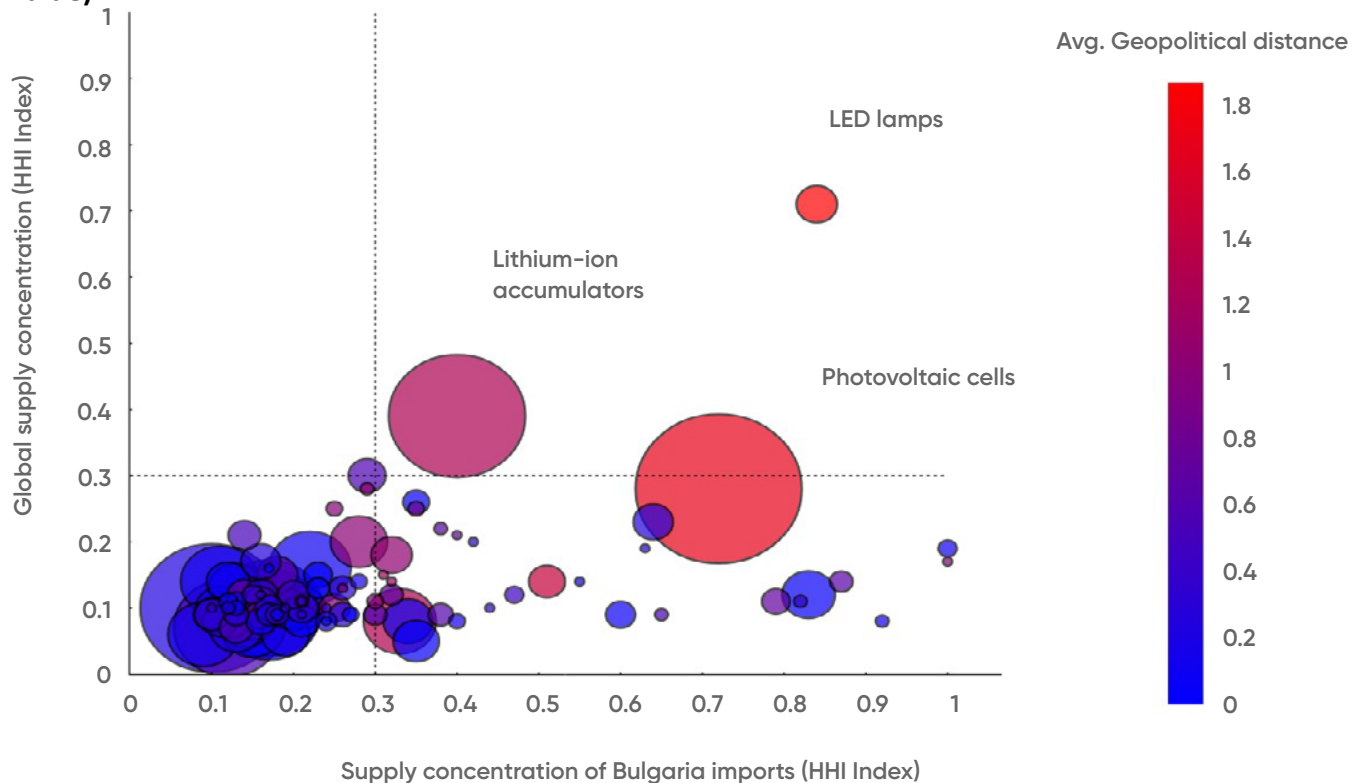
<sup>10</sup> Global Trade & Innovation Policy Alliance, *GTIPA Perspectives: How Smart Deregulation Can Unleash Powerful Innovations Worldwide*, 23 September 2025.

<sup>11</sup> Vladimirov, M. et al., *Fit for 2040: Reconciling Climate Ambition with Energy Security and Growth*, Sofia: Center for the Study of Democracy, 2025.

<sup>12</sup> European Commission and Council of Ministers of Bulgaria, National Recovery and Resilience Plan of the Republic of Bulgaria (as amended 2025, including REPowerEU chapter).

<sup>13</sup> Vladimirov et al., *Fit for 2040*, Sofia: CSD, 2025.

**Figure 1. Low-Carbon Technology (LCT) Supply Concentration by The Top 150 Trades (by Import Value)**



*Source: Institute of Baltic Studies based on UN Comtrade database.*

In 2024, the import of different ores made up 4.2% of Bulgaria's total imports (\$2.21 billion), most of which was copper (\$1.9 billion) – originating from Brazil, Georgia, or Turkey – followed by precious metals and zinc. Bulgaria also imports significant volumes of processed metals, primarily copper articles, which represent 2.4% (\$1.29 billion) of total imports, and aluminium articles which make up 1.6% (\$845 million) of foreign purchases. Even though Bulgaria is the EU's third-largest copper producer, the high imports of copper ore points to the country's very large refining capacity exceeding domestic extraction, making Bulgaria a hub for the production of higher-value copper products. For example, the largest copper refinery in Bulgaria, exports 70% of its output.<sup>14</sup>

The introduction of the Carbon Border Adjustment Mechanism (CBAM) will increase the price of ore imports from third countries, which may stimulate domestic extraction growth opportunities, which currently has relatively higher marginal costs of extraction. Yet, given that the largest refinery currently imports around 70% of its copper concentrates,<sup>15</sup> replacing imports with local mine sourcing requires careful planning and security coordination with OECD partners.

Given its vast domestic copper reserves, **Bulgaria is well-positioned to be one of the biggest contributors to the EU's strategic autonomy in CRM.** It accounts for around 5% of EU copper extraction and 6% of refined copper,<sup>16</sup> which has attracted robust downstream industries in cables and automotive wiring. These industries provide essential equipment to manufacturers of electric vehicles (EVs), low-carbon technologies, and digital infrastructure across the EU. Bulgaria is also a major gold producer (28% of the EU's total), cadmium (8%), baryte (11%), and silica sand (15%),<sup>17</sup> all essential to the manufacturing of low-carbon technologies such as solar panels, semiconductors, grid infrastructure, and batteries. Although manganese output has declined, geological resources remain and could attract new investment in their extraction as demand for steel and batteries rise. Bulgaria already has a comparative advantage in several product groups, such as electrical boards, panels, consoles, parts of electrical transformers and parts of engines, and significant opportunities exist to increase its share of the export market.<sup>18</sup> However, despite this significant potential for green growth, Bulgaria lacks a comprehensive strate-

<sup>16</sup> European Commission, *Study on the Critical Raw Materials for the EU 2023 – Final Report*, Luxembourg, 2023.

<sup>17</sup> Ibid.

<sup>18</sup> Based on an export potential analysis by the Center for the Study of Democracy (CSD), the Institute of Baltic Studies (IBS) and the Energy Policy Group (EPG).

<sup>14</sup> Mihaylov, I., "INTERVIEW - Aurubis Bulgaria expects rise in 2016/2017 copper concentrate throughput", *SeeNews*, 1 February 2017.

<sup>15</sup> Ibid.

gy to boost its technological leadership in low-carbon industries. This puts it on an economic trajectory where it will fail to reap the benefits of this potential. The strategic relevance of these capabilities is increasing as the energy transition converges with the AI stack boom.

The rapid expansion of AI infrastructure is reshaping global investment patterns and creating new demand for exactly those industrial capabilities in which Bulgaria already has a comparative advantage. The digital economy now accounts for nearly 25% of global GDP<sup>19</sup> and data centres are becoming one of the fastest-growing sources of electricity demand, with global consumption projected to roughly double by 2030, while competition for grid connections, electrical equipment and advanced components is intensifying.<sup>20</sup> This is already translating into a structural shift in location decisions. In Europe, grid congestion and long connection queues in traditional hubs such as Frankfurt, Amsterdam, Dublin and London are pushing investors towards alternative locations: around 65% of the data centre capacity pipeline is now located outside these core clusters.<sup>21</sup> Connection delays of 7–10 years in established markets further reinforce this trend, making grid availability and permitting speed decisive competitive factors.<sup>22</sup>

Bulgaria should therefore frame its industrial opportunity around a broader electrified infrastructure stack that will underpin Europe's clean-tech and AI competitiveness, extending beyond solar panels, batteries and EV components.<sup>23</sup> The country could position itself as a regional supplier of grid equipment, power-management systems, data-centre electrical components, battery integration services and CRM-based intermediate products, while also attracting parts of the AI infrastructure value chain itself.

Crucially, data centres are also a driver of new energy investments. They are already among the largest buyers of clean electricity, accounting for around 40% of global corporate renewable power purchase agreements (PPAs) in 2025 (around 30% in Europe), thereby directly supporting the development of new renewable generation capacity.<sup>24</sup> Long-term power demand from data centres tied to PPAs is beginning to underpin investment cases for new, cutting-edge low-carbon technologies, including small modular reactors (SMRs) and next-generation geothermal. Yet, if grid constraints

persist, there is a growing risk that developers resort to behind-the-meter fossil generation, particularly gas turbines, to secure reliable supply. Although this option remains heavily constrained due to average lead times for the delivery of gas turbines of five years (up from two years in 2021),<sup>25</sup> avoiding such a natural gas lock-in will depend on the ability of countries to expand grids and align clean generation with demand growth.

Data centres can also provide flexible load profiles that significantly increase effective grid capacity. Even modest flexibility (e.g. around 5% of load) can multiply the number of feasible connection points for large-scale facilities.<sup>26</sup> This means that data centres should be viewed both as a growing source of pressure on electricity systems and as a potential enabler of more efficient grid utilisation and faster integration of renewables.<sup>27</sup>

Bulgaria's renewable expansion, nuclear base, storage potential and strategic location in Southeast Europe could make it attractive for AI-ready infrastructure, but weak grid planning, slow connections and limited digitalisation risk undermining this advantage.<sup>28</sup> The AI-energy nexus therefore reinforces a central policy message: Bulgaria's ability to unlock its export-led growth potential will depend both on its industrial capabilities and on its ability to modernise the electricity system and better align energy, digital and industrial policy.

## Unlocking Bulgaria's Innovation Potential in Clean-Tech

Despite the extensive EU and national-funded support instruments, there are still major gaps remaining in national-level planning, innovation coordination, and targeted supply-chain incentives. Strengthening these mechanisms by prioritising strategic sectors, expanding R&D financing, and enhancing municipal implementation capacity would enable Bulgaria to better leverage the EU re-industrialisation efforts, capture greater value, and reduce vulnerability to supply-chain choke-points and shocks.<sup>29</sup>

**The Investment Promotion Act (IPA)** is Bulgaria's principal national instrument, offering priority invest-

<sup>19</sup> Global Trade & Innovation Policy Alliance, *GTIPA Perspectives: The Vital Importance of Digital Inclusivity for Global Economic Growth*, 2024.

<sup>20</sup> IEA, *Key Questions on Energy and AI*, Paris, 2026.

<sup>21</sup> Ibid.

<sup>22</sup> Cremona, E., and Czyzak, P., *Grids for data centres: ambitious grid planning can win Europe's AI race*, Ember, 2025.

<sup>23</sup> Gantcheva et al., *Future Resilience*, Sofia: CSD, 2025.

<sup>24</sup> IEA, *Key Questions on Energy and AI*, Paris, 2026.

<sup>25</sup> Crooks, E., "Supply chain constraints limit the growth of gas-fired generation in the US", *Wood Mackenzie*, 20 February 2026.

<sup>26</sup> Elia Group, *Grid Hosting Capacity*, 2026.

<sup>27</sup> Cremona, and Czyzak, *Grids for data centres*, Ember, 2025.

<sup>28</sup> Center for the Study of Democracy, *Promoting Constructive Capital in Bulgaria: Unlocking Bulgarian Regions' Potential for Private Sector Innovation and Development*, Sofia: CSD and ARCFund, 2021.

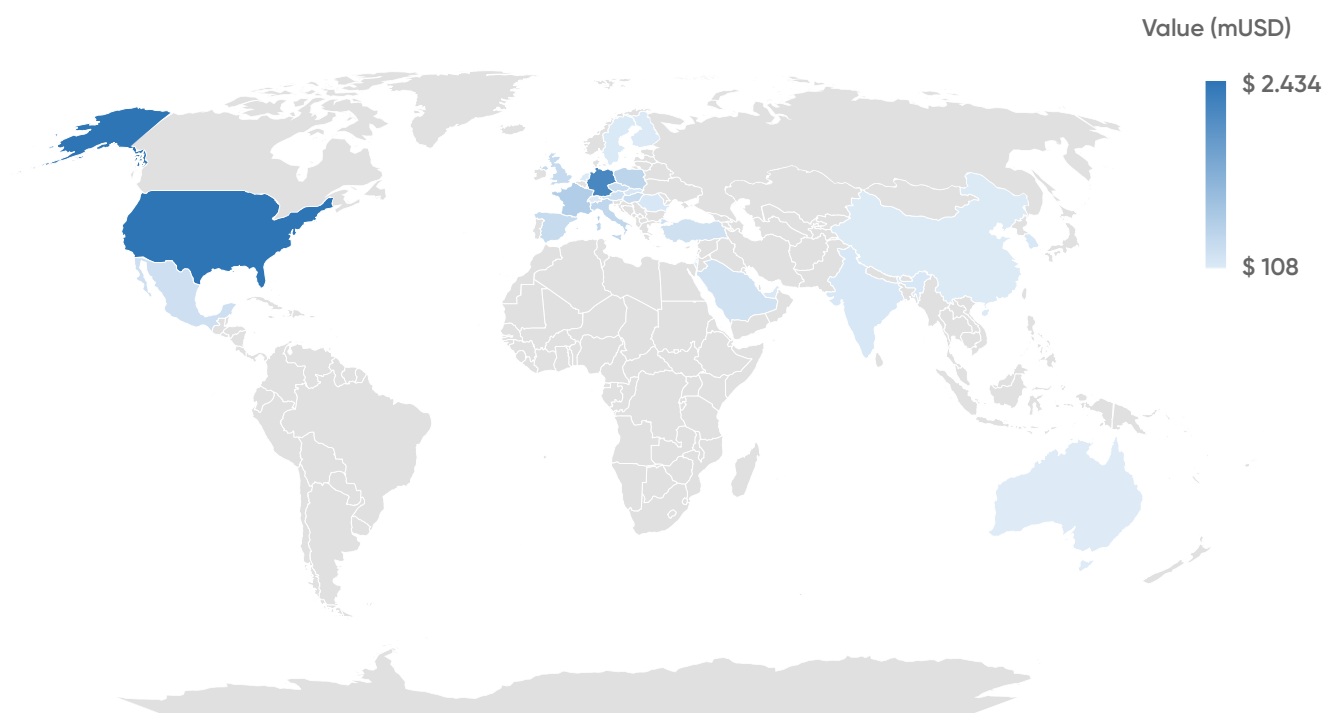
<sup>29</sup> Stefanov et al., *Innovation.bg 2025*, Sofia: ARC Fund, 2025.

ment certificates, expedited permitting, infrastructure support, and training subsidies to attract high-tech and export-oriented manufacturers. This mechanism currently does not systematically prioritise low-carbon or strategic-autonomy sectors.<sup>30</sup> Complementing the IPA, the **Innovation Strategy for Smart Specialisation (ISIS)** and programmes under the Ministry of Innovation and Growth provide R&D support, technology-transfer instruments, guarantee schemes, and SME internationalisation programmes. Only recently Bulgaria introduced also an R&D tax incentives package, which has been more than two decades in the making.<sup>31</sup> These tools aim to de-risk innovation in areas such as circular economy, clean manufacturing, and digital-industrial systems, and support Bulgarian firms' integration and growth in secure EU supply and value chains. Despite these instruments, domestic R&D investment remains low relative to EU averages, constraining scale-up potential.<sup>32</sup>

Bulgaria's current advancement in the deployment of low-carbon energy technologies has been driven by

market forces and EU funding rather than a coherent national strategy for decarbonisation or technological upgrading. Although the NECP and Bulgaria 2030 policy frameworks have set out broad ambitions to modernise the energy system and stimulate industrial innovation, neither provides a comprehensive roadmap for adopting low-carbon technologies in key sectors such as energy, industry, buildings and transport. Nor do they set out a clear game plan for integrating Bulgaria into European low-carbon supply chains through friend- or nearshoring. In practice, the NECP offers limited support for innovation procurement, domestic research and development, demonstration projects or scaling up key low-carbon technologies, such as heat pumps and electric vehicles. Bulgaria lacks targeted national programmes for clean-tech innovation and dedicated funding streams beyond EU instruments. Consequently, the country's innovation ecosystem is heavily reliant on external funding and policy direction from the EU, lacking national capacity for policy development and implementation despite significant opportunities for export-led green growth.<sup>33</sup>

**Figure 2. Bulgaria's Opportunities for Export Promotion in Low Carbon Technologies (Top 25 Destinations)**



**Source:** Institute of Baltic Studies based on UN Comtrade database.

<sup>30</sup> CSD, *Promoting Constructive Capital in Bulgaria*, Sofia: CSD and ARC Fund, 2021.

<sup>31</sup> Applied Research and Communications Fund, *Innovation.bg 2007 - The Bulgarian Innovation System in the European Union*, Sofia: ARC Fund, 2007.

<sup>32</sup> Applied Research and Communications Fund, *The Competitiveness of the Bulgarian Economy*, Policy Brief No. 1, June 2025.

<sup>33</sup> CSD, *Promoting Constructive Capital in Bulgaria*, Sofia: CSD and ARC Fund, 2021.

Bulgaria is already in a strong competitive position within certain segments of the clean-tech value chain, particularly in the production of electrical equipment such as boards, panels, and control systems. These components are essential for the operation of electrified economies, facilitating the distribution, management, and optimisation of electricity in industrial, residential, and energy systems. There is an additional short-term export potential of USD 4.3 billion, with key markets including the United States, Germany and Mexico. Electrical equipment accounts for over half of Bulgaria's total additional export potential, followed by machinery and precision instruments. The electrical equipment manufacturing sector already makes a significant contribution to employment and added value, while maintaining a relatively low environmental impact compared to other industrial activities.<sup>34</sup>

Bulgaria's ability to translate these advantages into technological leadership is hindered by ongoing regulatory, infrastructural and administrative shortcomings. The rapid expansion of solar PV has put considerable strain on the electricity system. Distribution networks, which were originally designed for centralised generation, are struggling to accommodate more decentralised and variable renewables. Bottlenecks at the transmission–distribution interface have become a key obstacle to connecting new renewable and storage projects. Yet the digitalisation of the grid is still in its infancy. Smart meter penetration is negligible, and despite growing recognition among policymakers and system operators that a large-scale rollout is inevitable, the absence of a national deployment strategy continues to delay progress.<sup>35</sup> Without significant advances in digital infrastructure, Bulgaria will be unable to utilise the full benefits of advanced technologies such as battery storage, demand response and grid support services. Overcoming these barriers is essential if Bulgaria is to progress beyond technology adoption and establish itself as a competitive producer and exporter within Europe's low-carbon industrial ecosystem.

## The Social Foundations of Bulgaria's Energy Transition

A rapidly shrinking and ageing population, coupled with rising demand for skilled labour in the energy, construction and industrial sectors, is creating a fundamental capacity constraint that risks slowing down the deployment of low-carbon technologies and infrastructure in Bulgaria. Since 2011, the working-age population has declined by almost 20%, while the median age

has risen to 47.3 years,<sup>36</sup> placing Bulgaria among the fastest-ageing societies in Europe. Conversely, over a quarter of workers in key sectors such as energy and construction are already over 55, highlighting the urgent need for workforce renewal and reskilling.

Amidst some of the lowest unemployment levels in the EU of around 4.3%, labour shortages are widespread, with over 60% of firms reporting difficulties in finding qualified workers.<sup>37</sup> These shortages are particularly acute in technical professions that are critical to the energy transition, such as electricians, HVAC specialists, and digital and engineering professionals. Although employment in the renewable energy, energy efficiency and circular economy sectors has increased, creating over 54,000 jobs since 2023, the current skills base remains insufficient to sustain future growth.<sup>38</sup> Adult education remains below 2%, which significantly limits the ability to reskill workers on a large scale. Consequently, workforce constraints are delaying project implementation, increasing costs, and reducing the competitiveness of emerging green industries.<sup>39</sup>

Although existing policy frameworks in Bulgaria acknowledge labour force-related challenges, they have yet to deliver the required results on a large enough scale. The National Employment Strategy (2021–2030) and the National Skills Strategy aim to expand the labour supply, improve workforce quality and strengthen the link between education and labour market needs by modernising vocational training and fostering closer cooperation between employers and training institutions.<sup>40</sup> However, implementation remains uneven and the pace of reform does not yet align with the urgency of the demographic decline. Without accelerated action on education reform, vocational training and targeted migration policies, Bulgaria is facing a structural labour shortage that would restrict investment and hinder its integration in European technology value chains.

Public support for the energy transition remains conditional and unevenly distributed, adding another layer of uncertainty.<sup>41</sup> While environmental protection enjoys broad support in principle, willingness to bear the costs

<sup>34</sup> CSD based on Eurostat data.

<sup>35</sup> Vladimirov, Gantcheva, and Koeppen, *Beyond Diversification*, Sofia: CSD, 2026.

<sup>36</sup> Vodenova, Y., and Tsvey, I., "Bulgaria Remains among EU Countries with Oldest Population in 2025", BTA, 13 February 2026.

<sup>37</sup> European Commission, Country Report – Bulgaria 2025, Directorate-General for Economic and Financial Affairs, Brussels, 2025.

<sup>38</sup> International Renewable Energy Agency, IRENA Renewable Energy and Jobs – Annual Review 2024, Abu Dhabi, 2024.

<sup>39</sup> European Commission, *Employment in Energy Sector: Status Report*, Joint Research Centre, Brussels, 2020.

<sup>40</sup> Bulgaria, Ministry of Labour and Social Policy, National Employment Strategy of the Republic of Bulgaria 2021–2030, Sofia, 2022.

<sup>41</sup> Vladimirov, Gantcheva, and Koeppen, *Beyond Diversification*, Sofia: CSD, 2026.

of the transition is limited, particularly during periods of high inflation or rising energy prices.<sup>42</sup> Most households perceive climate policies primarily through the lens of affordability, and resistance tends to increase when policies are associated with lifestyle changes, higher short-term costs or the creation of new business opportunities requiring reskilling. This is reflected in comparatively low levels of concern about climate change: Only 33% of Bulgarians rank it among the most serious problems facing the world today, compared to an EU average of over 47%.<sup>43</sup>

Socioeconomic inequalities further shape these attitudes. Energy poverty remains a significant challenge. Although the proportion of households unable to adequately heat their homes has fallen from 30% in 2019 to 16% in 2025, this figure remains substantially higher among lower-income groups (33%), raising concerns about the distributional impact of climate policies.<sup>44</sup> Consequently, public acceptance of the energy transition hinges heavily on perceptions of fairness, affordability, and tangible benefits such as job creation, improved living conditions, and lower long-term energy costs.

Trust in public institutions is an additional constraint. Confidence in the government's ability to manage the transition effectively and fairly remains low.<sup>45</sup> Continuous political instability, frequent elections and delays to major infrastructure projects have led to wide-spread distrust in the quality of governance, creating fertile ground for populist narratives that frame the energy transition as a threat to economic stability.

## What's Next for Bulgaria's Green Growth Agenda?

Bulgaria's long-term green growth trajectory will be shaped by how successfully it can combine deep decarbonisation with competitiveness, energy security, and social resilience. The foundations for the transition are largely in place. Bulgaria operates within a stable EU climate-policy framework, has embedded EU climate targets into national planning through the revised NECP, and can draw on substantial EU instruments to finance investment and reforms. Yet Bulgaria's economic development remains highly sensitive to external shocks and internal policy and governance capacity limits.

The reconfiguration of global trade is likely to shape Bulgaria's growth model as much as climate policy itself. Rising protectionism, industrial policy interventions and competition over strategic technologies and resources will affect market access, investment and supply chains. In a favourable scenario, Bulgaria could leverage EU industrial policy and its existing industrial and technological base to integrate more deeply into European clean technology value chains. However, in a more fragmented trade environment, the country risks becoming dependent on imported non-OECD technologies and missing opportunities for value creation. Bulgaria already possesses the necessary capabilities in areas such as energy infrastructure, components manufacturing, hydrogen-related systems, and digital services. However, their contribution to sustainable growth hinges on consistent policy signals, stable regulations, and targeted support for innovation and improvement.

Another major uncertainty is Bulgaria's demographic crisis and its implications for institutional and labour-market capacity. A shrinking workforce, persistent emigration and ongoing challenges in education and skills are creating structural bottlenecks in many of those sectors that could boost green growth. Therefore, even if funding is available and technologies are ready, the transition could stall if projects cannot be permitted, constructed, connected and operated quickly enough.

National instruments and associated EU funding are key but using them to their full potential will depend on further domestic governance efforts. To ensure a robust and competitive transition, Bulgaria must complement its current frameworks with a more strategic approach that explicitly links climate goals to industrial development, labour market policy and institutional capacity building.

- **Set a clear long-term sovereign vision for Bulgaria's green economic transformation** by using the NECP as the central planning framework linking energy security, industrial competitiveness, and technological development across national strategies. This vision should grow Bulgaria from an energy corridor to a regional hub for AI, clean technologies, low-carbon industry, and digital infrastructure.
- **Develop competitive domestic clean-technology industries** by building on Bulgaria's strengths in metals, electronics, ICT, and mechanical engineering, and targeting higher-value segments such as power electronics, batteries, grid-digitalisation technologies, offshore wind components, and carbon capture utilisation and storage (CCUS) services. Industrial policy should align these prior-

<sup>42</sup> Ibid.

<sup>43</sup> European Union, [Eurobarometer on Climate Change](#), 2025.

<sup>44</sup> Eurostat, [Inability to keep home adequately warm](#), last accessed 5 April 2026.

<sup>45</sup> OECD, [Government at a Glance: Western Balkans and Bulgaria](#), 2023.

ities with EU initiatives and funding instruments, including the Net-Zero Industry Act, Critical Raw Materials Act, and EU climate and innovation funds. Bulgaria should quickly accede to global peer AI stack development policies, such as the OECD's Global Partnership on Artificial Intelligence (GPAI), the US Pax Silica, and the EU-US Critical Minerals Action Plan.

- **Invest in skills, education, and domestic R&D capacity** by scaling STEM education, vocational reskilling, and applied research, and by moving national R&D spending toward the 1.5% of GDP target. Adopt more proactive and targeted migration policies to attract foreign talent to key sectors. Public-private innovation hubs and technology-transfer centres should focus on commercialising Bulgarian strengths in low-carbon technology areas.
- **Ensure social benefits and build public trust in the transition** by using the Social Climate Plan and Just Transition resources to reduce energy poverty, accelerate building renovation and heating electrification, and provide credible economic alternatives and reskilling pathways in coal regions. Early stakeholder engagement, transparent governance, and local benefit-sharing mechanisms are critical to building trust and countering disinformation. Open and prioritise EU operational program support for households and underprivileged communities, targeting aggressively and simultaneously small business and entrepreneurship development, innovation democratization and energy poverty and inequality.
- **Strengthen the capacity to deliver the energy transition** by streamlining the permitting and grid connection procedures further, and by ensuring that grid modernisation and digitalisation keep pace with the electrification of the economy.