

## CARBON NEUTRAL BULGARIA 2050: A CHEAT SHEET FOR POLICY-MAKERS

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**Ambitious leadership with strategic vision** is the one thing Bulgaria's policymakers need, to take advantage of the largest green stimulus package in European history. The vast resources of the 2021-2027 Multiannual Financial Framework, boosted by its NextGenerationEU recovery plan can deliver a true green transformation of the national economy. This is not about formally meeting the high requirements on climate spending for the National Recovery and Resilience Plan - 37% - but most of all **ensuring that Bulgaria catches up with the rest of Europe in this environmental, socio-economic and digital transition.**

Reaching carbon neutrality by 2050 is possible for Bulgaria. **The least costly pathway is to transform the electricity supply mix and to boost electrification in key economic sectors**, which also means modernising and improving the resilience of the whole power system.<sup>1</sup> **The other absolute must is the reduction of energy demand** through comprehensive energy and material efficiency measures and promoting new consumer behaviours and business practices. A competitive, carbon-neutral Bulgaria by 2050 would require the **strategic mobilisation of some of the following policy measures over the next three to seven years.**

### KEY POINTS

- **The Bulgarian government needs to take a sober look at the great challenge of decarbonisation.** There are unprecedented vast resources available, but without strategic vision, even they would not be enough.
- **Carbon neutrality by 2050 is possible** and it means clean electrification, reducing energy intensity, and crucially more effective governance.
- **The national plan needs to create a fertile environment** for private investments, not just finance a few large infrastructure projects.
- This is more than an environmental challenge. **Energy security is also at stake**, with energy poverty remaining the single greatest risk.
- **Decentralisation** of the energy system and **enabling vulnerable consumers** to become active participants in the transition is key.
- Energy security also means **resilient power grid**, integrating storage and smart meter technologies, and improving interconnectedness with neighbouring countries.

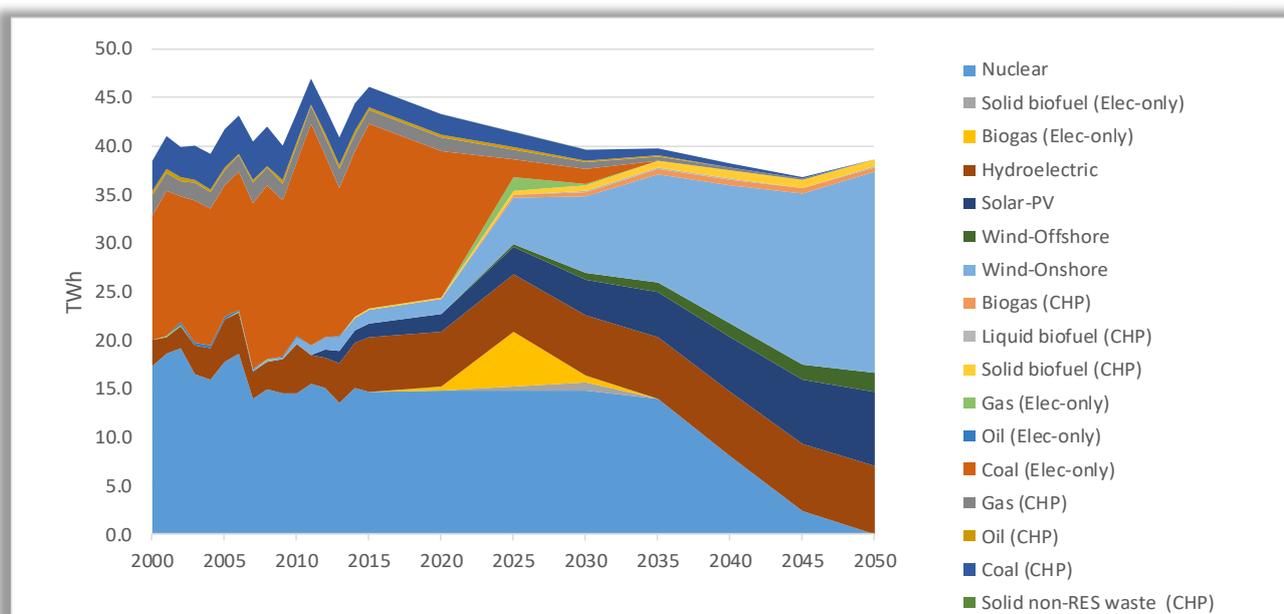
<sup>1</sup> Center for the Study of Democracy, [Green Recovery Pathways to Bulgaria's Carbon Neutrality by 2050](#), Policy Brief No. 101, June 2021.

## Low-Carbon Electrification and Grid Resilience

Decarbonizing the current power mix of Bulgaria means a fast-tracked phase-out of coal power plants and boosting renewable energy supply. This requires, among others, leveraging of the public with considerable private investments, incentivising the decentralisation of energy supply, and improving the resilience and reliability of the power grid.

- Coal phase-out:** A major source of public financing for the industrial restructuring of coal regions will come from the Just Transition Fund. It is crucial that these resources are directed towards sustainable projects with strong decarbonisation rationale. Financing new fossil-fuel based infrastructure must be avoided at all costs and any investment in hydrogen production must focus exclusively on green hydrogen, mainly from wind and solar energy. The announced plans for the expansion of the natural gas transmission infrastructure and the construction of a new 1 GW gas-fired power plant<sup>2</sup> is a step in the wrong direction. It would increase energy security risks as it would perpetuate the Bulgarian gas import dependence on Russia.
- Electrification** of buildings' energy demand (especially the full electrification of cooking), transportation, and key industrial sectors such as iron and steel production is the least costly pathway to carbon neutrality in tandem with the massive uptake of renewables. The support for green hydrogen and synthetic fuels in industry should also be explored, through R&D programs and pilot projects. Meanwhile, the electrification of transport, including public and freight transport, could be kick-started by the elaboration of an e-mobility action plan, supported by stimulus measures and tax incentives for low-emission vehicles. There is also the need for tangible modernization and expansion of Bulgaria's highly outdated railway infrastructure. This is the most efficient low-carbon mode of transportation currently available.
- Renewable Energy:** The fast uptake of renewable energy is necessary to fill the supply gap from the coal and to meet the additional demand from the electrification of buildings, transportation, and industry.

### Electricity production and combined heat & power (CHP) by source in the GreenPlus Scenario



Source: CSD based on the Calculator tool

Note: The GreenPlus scenario foresees a moderate pathway for Bulgaria's transition to carbon neutrality via a mix of technological and behavioural changes. For further details, please see Center for the Study of Democracy, [Green Recovery Pathways to Bulgaria's Carbon Neutrality by 2050](#), Policy Brief No. 101, June 2021.

<sup>2</sup> Bulgarian Council of Ministers, [National Recovery and Resilience Plan of The Republic of Bulgaria](#), version 1.3, 20 July 2021.

- **Hydropower** is one of the most flexible electricity generation technologies and its role in ensuring system reliability is expected to grow, so adequate financing should be directed for modernisation and expansion of the existing power generation stock.
- The National Recovery and Resilience Plan should be used to better harness Bulgaria's onshore and unlock its **offshore wind energy** potential in the Black Sea, which is estimated at 115 GW<sup>3</sup>. The plan should aim to develop an appropriate regulatory and legal framework, as well as a pilot paving the way for much greater private investment in the medium term.
- Geothermal energy and particularly heat pumps should become the main source of space heating and hot water supply by 2050.
- **Private investment in the proliferation of decentralised energy systems** is crucial for unlocking the potential for small-scale renewable energy estimated at around 5 GW of installed capacity:
  - The Bulgarian government needs to adopt a regulatory framework including on net-metering and energy storage use to ensure that all consumers, including low-income households, can participate in renewable energy communities that are clearly defined by the national legislation<sup>4</sup>.
  - Consumer Stock Ownership Plans or similar business models could be incorporated into the funding programs as innovative financial instruments to promote the co-ownership of renewable energy sources by vulnerable consumers and the upscaling of renewable energy communities.
  - Micro-grant schemes should be used for financing projects for community-owned renewable energy projects and more generally to incentivise individual energy supply investments.
- **Power Grid Resilience:** The accommodation of a large share of variable renewable energy sources requires a modern, flexible, and resilient power system and closer integration with the wider

European power market. The decentralisation of the power grid will not be possible without the integration of smart grid technologies, allowing better monitoring and control of the system and further ensuring the security and efficiency of supply. Furthermore, modernisation of the power grid will ensure stronger resilience to climate change impacts such as extreme weather events, which is crucial for the future of Bulgaria's energy security. This includes the enhanced hydropower capacity, but also additional investment in diverse storage technologies. The expansion of renewables in the whole Southeast European region could undermine the regional power system adequacy. Bulgaria will likely become a net importer of electricity over the next decade, which means that security of supply would depend on a much better regional cooperation between transmission system operators and an upgrade of the cross-border transmission capacity. The SEE region is also still not well integrated into the Western and Central European grid, which presents a key impediment to a fully decarbonized electricity system.

## Moderating Energy Demand

Reducing the energy intensity of Bulgaria's economy is critical for reaching carbon neutrality. It is also a key policy for improving energy security as lower energy consumption means less energy imports and less power system volatility in peak demand periods. Reducing energy demand requires energy efficiency measures and incentives for a change in consumption behaviours and business processes. The biggest challenge will be to introduce costly new technologies in Bulgaria's industry for circular forms of production and material efficiency.

- **Improving energy and material efficiency** are key prerequisites for the decarbonisation of all economic sectors. Despite the large-scale energy efficiency programs for residential and public buildings in the proposed EU and national funding instruments, these efforts need to be streamlined to achieve meaningful reduction of energy consumption. Support measures need to come

<sup>3</sup> Center for the Study of Democracy, *Assessment of the Black Sea Offshore Potential for Wind Power Generation in Bulgaria* (forthcoming).

<sup>4</sup> Center for the Study of Democracy, *Mapping policy options for renewable energy communities in Europe*, Policy Brief No. 93, November 2020.

hand in hand with tackling long-term energy security challenges such as energy poverty and the delayed market liberalization that has entrenched wasteful consumption.

- **There needs to be a considerable increase in both the rate of renovation (from less than 1% currently to 3-4% over the 2021-2026 period) and its depth.** Deeper renovations would incorporate a transition to near-zero energy buildings where renewable energy heating and power production become integrated into the overall demand structure of buildings. Measures here should prioritize the worst performing buildings and target households suffering from energy poverty as key beneficiaries.
- **The Operational Program Competitiveness and Innovation in Enterprises** should support energy efficiency measures for energy-intensive industrial sectors, as well as recycling and improving the quality and efficient use of materials. Additionally, the **improvement of manufacturing processes**, the reduction of output losses (e.g. via 3D printing), and the introduction of smart production designs could be supported via a dedicated stream of funding from the 'Smart Industry' component of the National plan.
- **Behavioural changes** such as lifestyle choices and consumption patterns, different travel modes, and diet preferences are powerful tools for curbing energy demand and reducing carbon intensity.
  - The government should **phase-out artificially-low, regulated energy prices** that disincentivize the middle-class from investing in energy efficiency improvements or switching to cleaner energy fuels for heating and cooking. The energy price liberalization must be **implemented together with a more comprehensive policy for tackling energy poverty**<sup>5</sup> and enabling vulnerable groups to become active participants in the energy transition by reducing the cost burden for energy efficiency investments, promoting co-ownership of renewables and prosumerism.

- The decarbonisation of the transport sector cannot be fully implemented without a significant reduction in demand, meaning a **massive drop in car usage** in favour of public transport, which will depend on the improvement of the railway infrastructure and the introduction of higher taxes for the ownership of vehicles with internal combustion engines.
- In freight transportation, the **optimization of routing** through digital solutions and monitoring also presents opportunities for large energy savings.
- Measures for **easing pedestrian movement**, the introduction of low-emission zones by municipalities, and the expansion of biking infrastructure are other key factors contributing to a lower car usage.

## What's Next: Improving Energy and Climate Governance

The Bulgarian NRRP and the strategic documents supporting the MFF in Bulgaria still lack a much needed broader strategic vision on how to tackle the pressing energy and climate security challenges of the upcoming environmental, socio-economic, and digital transformation of the Bulgarian economy. The focus of the funding instruments still lies on **large infrastructure projects** and reflects a piece-meal approach in developing green recovery policies. The design and implementation of sophisticated environmental and energy policies that meet the key objectives outlined above require **more effective governance and rule of law regimes**, with regulatory institutions and state-owned energy companies that operate independently from oligarchic influence. **Better monitoring tools that measure the impact of funded projects in real time**, the introduction of specific performance indicators, comprehensive cost-benefit and impact assessments, and energy audits should be considered a high priority. **Specific control mechanisms need to be adequately defined** in national strategic documents. External expertise should be involved to improve transparency and accountability.

<sup>5</sup> Energy poverty is identified as the biggest threat to Bulgaria's national energy security; Bulgaria, Ministry of Economy and

Energy, [National Security Strategy of the Republic of Bulgaria](#), 2011.