



A breath of fresh air: Offshore wind in Bulgaria

After years of debate, Bulgaria could finally unlock the offshore wind potential of the Black Sea, bringing economic and security benefits.

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About

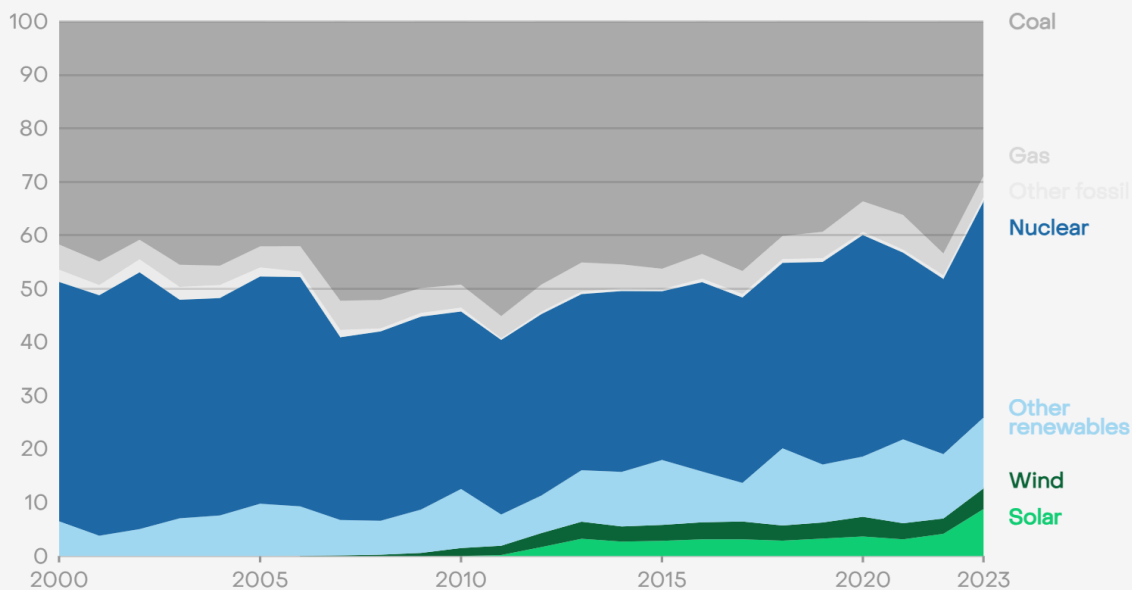
Bulgaria is currently discussing the introduction of an offshore wind law, with the second reading in parliament expected to happen after February 22nd. After years of debate, this could finally unlock the offshore wind potential of the Black Sea, bringing benefits such as lowered power prices, the expansion of new industries and a surge in foreign investment.

Coal at record lows, pivotal moment for wind

The discussion around offshore wind comes at a pivotal moment for Bulgaria. In 2023, the country's share of electricity generation from coal dropped below 30% (to 28.9%) for the first time. This was due to a significant increase in solar power (+68% year-on-year) and a decrease in power exports. Clean power surged to provide 66% of domestic electricity generation.

Bulgaria hit 66% clean power in 2023, with coal dropping below 30% for the first time

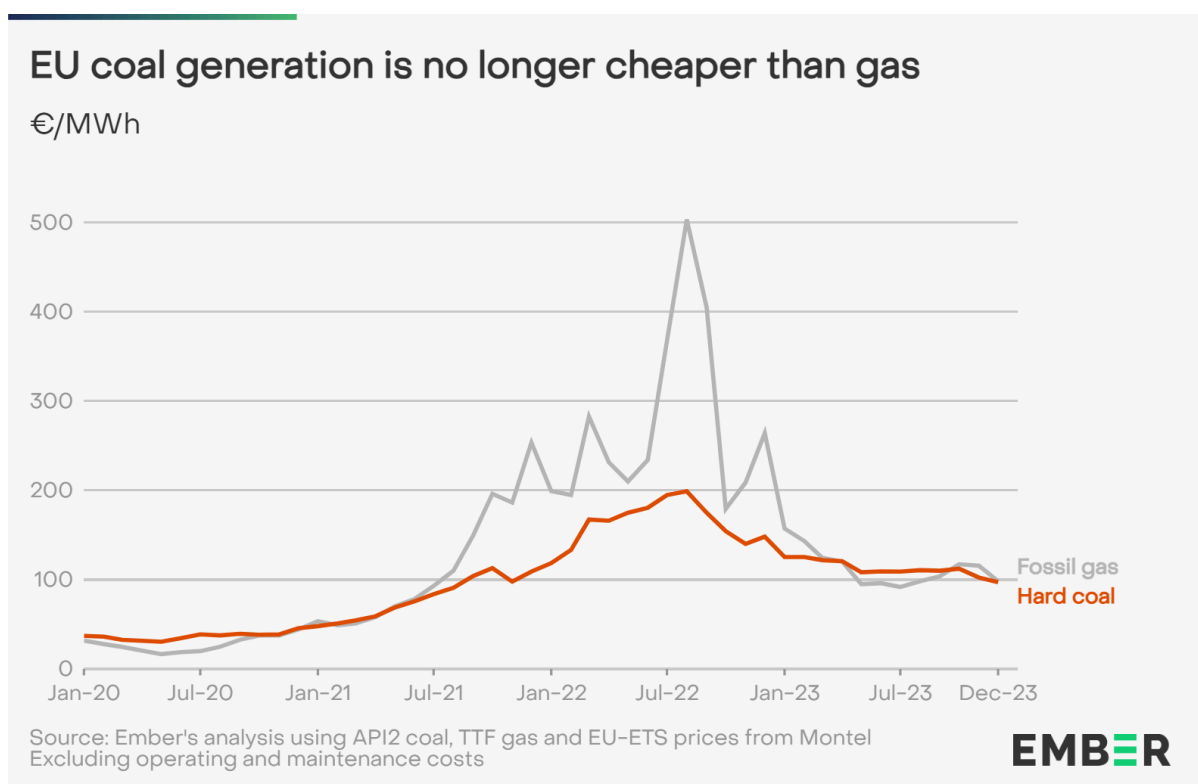
Share of Bulgaria's electricity generation, by source (%)



Source: Annual electricity data, Ember
Other renewables includes bio and hydro energy

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Across Europe coal power is again more expensive than gas, shifting the trade flows in countries like Poland, Bulgaria and Czechia. Those countries surfed the high gas prices in 2022, selling relatively cheaper coal power to neighbours. But in 2023, the price hierarchy reversed back to its previous dynamic. Coal is likely to remain the most expensive source of electricity generation in the future, posing a risk to the competitiveness of coal-dependent economies like Bulgaria (even ones that manually regulate coal prices). This is on top of existing pressure to move away from coal given the mounting concerns about [health implications for citizens](#).



Tapping into potential

Renewables could start to play a larger role as coal continues to decline. It is likely that the unfavourable market conditions will force [coal plants to shut down well before 2038](#), which is the official coal exit date. The government's draft [Strategy for Sustainable Energy Development](#) assumes that already by 2035 no more than 1 GW of coal reserve will be present in the system. Despite being cited as one the most modern and cost-competitive

coal plants in Bulgaria, ContourGlobal's 908 MW Maritsa East 3 [anticipates a risk of shutting down even earlier in current market conditions](#). The AES Galabovo power plant is likely to stop burning coal [by 2026](#). However, if Bulgaria does not proactively move to provide a replacement, the missing electricity will need to be imported.

That is where renewable power comes in. Bulgaria's solar generation already increased by a record amount in 2023, growing by 1.4 TWh (68%), more than double the growth in 2022 (+0.6 TWh, +42%). In 2023, Bulgaria also doubled the solar capacity, adding over [2 GW](#) in 2023 alone and reaching 3.9 GW by the end of the year. In the last three years, the country has almost tripled its solar capacity.

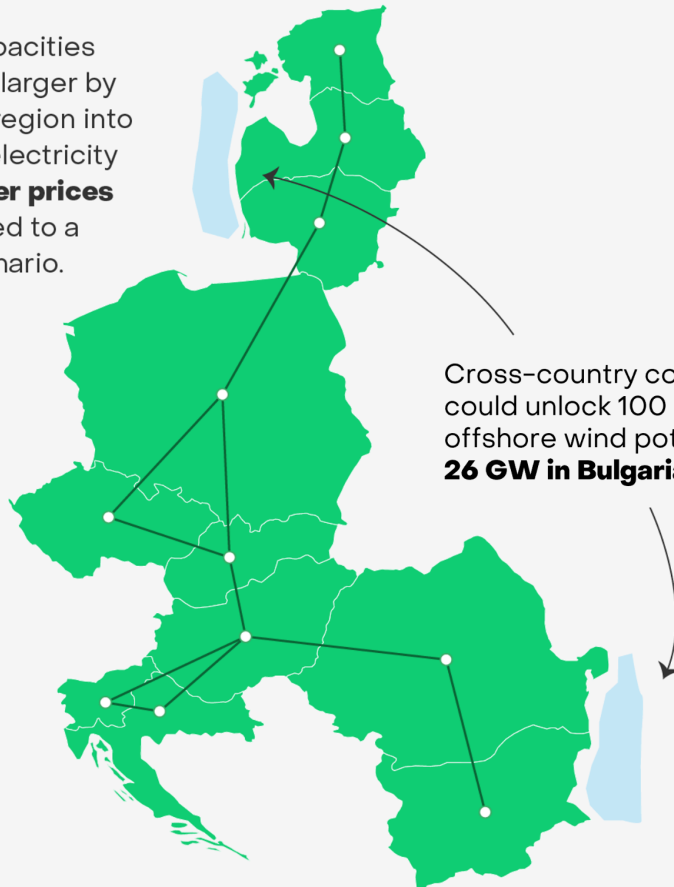
However, in terms of wind energy, the situation is less positive. Wind generation has essentially stalled since 2012. The decade of stagnation was caused by [governance shortcomings](#), a lack of political will and grid access constraints. The government plans to add 0.6 GW of onshore wind and 0.5 GW offshore wind by 2030 in the [draft Strategy for Sustainable Development](#), but these goals remain very conservative and would leave Bulgaria far behind the rest of Europe.

These targets also fall short of Bulgaria's vast offshore wind potential. The most promising area of Bulgaria's maritime exclusive economic zone (EEZ), next to the border with Romania, has a technical potential of [4.3-5 GW](#), with capacity factors ranging from 45 to 48 percent and a levelized cost of electricity between [EUR 62-90/MWh](#). This is already below the running costs of coal and gas, and Bulgaria's offshore wind could be accessible as soon as 2030.

The potential for low electricity costs is why coastal countries across the whole Central and Eastern Europe (CEE) have demonstrated an increasing interest in deploying offshore wind energy. Already by 2030, the region could aim for [20 GW](#) of installed capacity, a third of the [EU target](#), with a long-term potential of 100 GW. However, the official 2030 targets set by CEE countries in the [National Energy and Climate Plans](#), and non-binding targets from the [Offshore Network Development Plans](#) only add up to 10 GW - half of what the region could be aiming for by the end of the decade. Proposing ambitious targets is necessary to justify the development of regional [offshore grid infrastructure](#) as envisioned by the TEN-E Regulation, including cross-border connections that are essential to fully access the economic and security benefits of wind power.

Collaboration between CEE countries could unlock huge benefits in powering the region

Wind and solar capacities could be six times larger by 2030, turning the region into a **net exporter** of electricity and **lowering power prices by a third** compared to a current policy scenario.



Cross-country collaboration could unlock 100 GW of offshore wind potential, **26 GW in Bulgaria alone**

Source: Ember, 'In it together: the road to a cleaner, cheaper CEE power system' (2023)

Reaping the benefits

Wind energy could transform Bulgaria's power market. According to Ember's modelling Bulgaria could lower wholesale power prices by a substantial [45% in 2030](#) by developing 1.8

GW of offshore wind, increasing the 2030 onshore wind capacity target to 3.9 GW, and increasing interconnection capacities between Bulgaria, Romania and Greece. This price reduction would be possible through an almost complete lack of increasingly expensive fossil fuels in electricity generation. By the end of the decade, Bulgaria could be running on 86% clean power, with coal and gas reduced to balancing and combined-heat-and-power roles.

This has several economic benefits. Ember's research shows that even accounting for the costs of grid expansion and balancing, a wholesale price decrease thanks to clean power translates into significant [savings for households](#). And with the EU industry struggling to compete on global markets, the reduced energy costs for businesses could make Bulgaria an attractive investment destination. The surplus of wind energy could also be used to produce hydrogen, for use in sectors like transport and manufacturing.

There are significant implications for security as well. Bulgaria is still dependent on [Russian gas](#), though not importing directly from Gazprom. With the Biden administration [suspending approvals for liquified natural gas \(LNG\) exports](#) in response to [climate concerns](#), replacing coal with gas is increasingly a security threat. This is where wind energy shines, producing cheap clean power without the need to import fossil fuels from unreliable sources.

Wind is poised to take off in Bulgaria, if enabled. 2023 was the beginning of the end for coal generation in Bulgaria, as it was priced out by booming solar generation domestically and failed to compete with growing renewables in neighbouring markets. Missing out on the renewables growth story would cost Bulgaria its role as a major electricity exporter and millions in potential investments. 2024 can mark the beginning of a spectacular growth story for offshore wind in Bulgaria, leading to multiple economic benefits but it needs to act swiftly and catch up with the rest of Europe.

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Policy will be needed to enable wind growth

The first step towards harnessing wind potential has already been taken. A draft of Bulgaria's offshore wind law was submitted in December 2023 and approved after the [first reading](#) in Parliament. It is now awaiting a second hearing.

However, the proposal gathered criticism from multiple stakeholders. The transmission system operator (TSO) has expressed concerns about the introduction of [Contracts-for-Difference](#) (CfDs), a common instrument for revenue stabilisation and price risk minimization for offshore wind investments. There is also no consensus whether offshore wind farms should be governed by dedicated regulations (like for example in Poland, Germany, Greece among others), or be included in the existing legislation. The Greens, environmental NGOs and the Ministry of Environment are raising social and environmental concerns. Some stakeholders are also worried that offshore wind will be favoured over onshore wind.

As context to navigating these decisions, it should be remembered that the ultimate goal of building offshore wind farms is to combat climate change through reduced emissions, and also to reduce the [death toll](#) of toxic coal power generation, while stabilising the price burden to the final consumers.

Looking to other countries can help with precedent. Decisions regarding offshore wind farms should be governed by an environmental impact assessment (EIA), as with all infrastructure investments in most countries. Offshore wind should also be [integrated into the national Marine Spatial Plan](#) (MSP) in a comprehensive way that ensures synergies with other activities and deals with potential conflicts. However, Bulgaria's MSP, officially adopted in 2023, does not provide details about how offshore wind could be developed in the Black Sea, nor does it identify specific areas or reference detailed potential studies. Both of the latter should be part of the Marine Spatial Plan to ensure that offshore wind will be developed in synergy with other activities in marine territories.

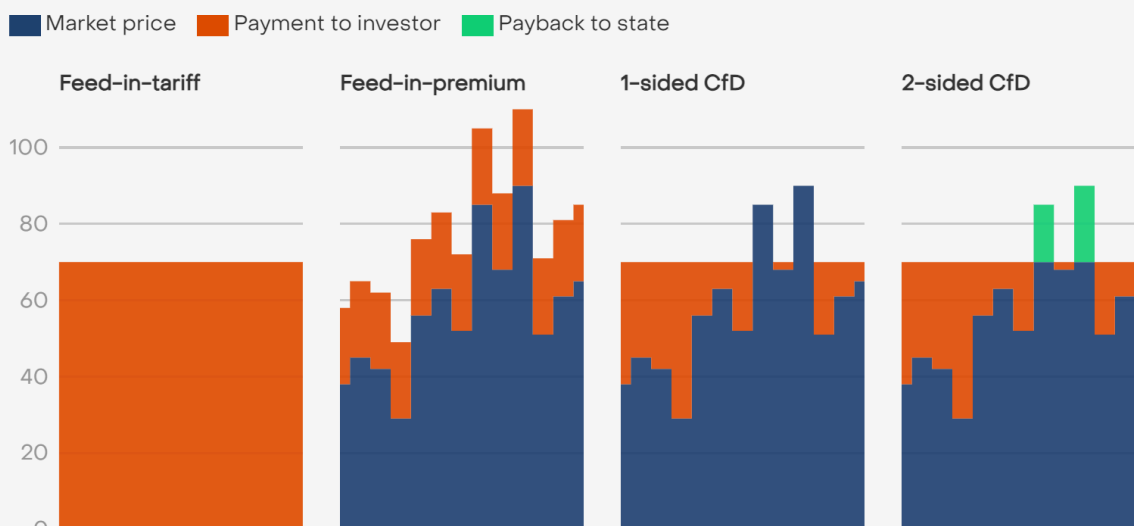
Onshore and offshore wind should also not be perceived as competing for grid capacity. Offshore wind developers should contribute to the necessary grid expansion, which, in the case of a joint Romania-Bulgaria offshore project can also be supported from the Connecting Europe Facility. Inspiration for this arrangement is already available from the joint Estonia-Latvia [ELWIND](#) project and an [exchange](#) between policy-makers in Bulgaria, Estonia and Latvia already took place. Moreover, both onshore and offshore wind projects could benefit from attracting policy attention and investments in modernising and expanding

the electricity grid in Bulgaria’s northeast. [Ember’s modelling](#) also sees no significant curtailment of onshore wind energy from additional offshore wind, even in the 2030 timeframe when electricity demand for electrification and hydrogen is still low and storage deployment minor.

At the same time, the strategic importance of offshore wind warrants additional support. This support can be granted through schemes such as two-sided [CfDs](#), which provide protection both for investors and consumers. The CfD results from competitive auctions that [increasingly include non-price criteria](#) such as environmental footprinting, circularity, or other environmental and socio-economic aspects. The fixed price of the CfD lowers the cost of capital for investors, which translates into lower power prices. CfDs are also a minor expense for the state budget because the investor is paid a variable premium only when the market price is lower than the CfD price and, crucially, they pay back to the state when the market price rises above the CfD price.

Contracts-for-difference (CfDs) provide protection for investors and consumers

CfDs stabilize wind farm revenues, but are a minor expense for the state budget – in fact they pay back if the market price is above the strike price



Source: Ember based on RAP

In fact, in the UK, wind and solar projects with CfDs have been paying millions of pounds [back to consumers](#). That is why they’ve already been introduced for different types of renewable technologies including offshore wind in many countries, including [Poland](#), [Lithuania](#), France, Greece, Hungary, Ireland, Italy, Spain, Portugal, the UK, and are expected

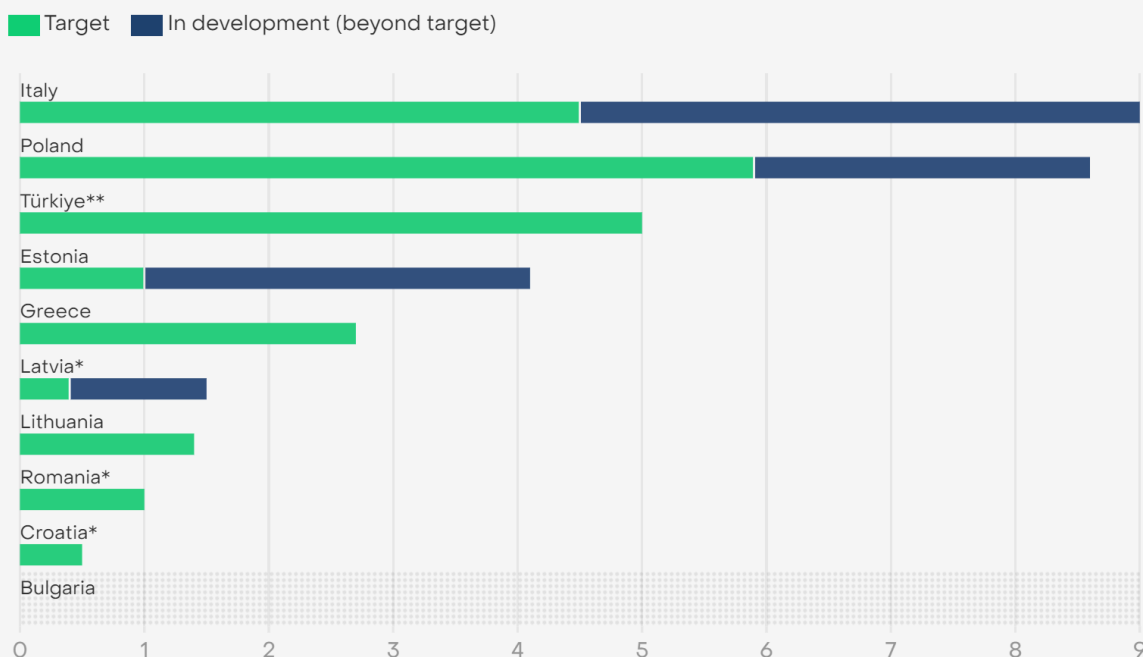
to launch in [Romania](#) in [2024](#). There is a strong case for the rapid adoption of offshore wind CfDs in Bulgaria. If not, Bulgaria might be among the last Central and Eastern European countries with sea access not capitalising on offshore wind potential. In fact, according to the association of European grid operators [ENTSO-E](#), Bulgaria, Slovenia, and Cyprus are the only coastal countries in the whole EU which did not announce any non-binding targets for offshore wind.

Aligning ambition

Bulgaria needs to catch up to its neighbours, and it is necessary to build a political consensus that wind power is a key part of Bulgaria's energy system. This will need to be detailed in the country's expected Climate Neutrality Roadmap and the updated National Energy and Climate Plan (NECP), which should include explicit offshore wind targets. Bulgaria is among just three EU member states that have still not submitted draft NECPs yet despite the mid-2023 deadline.

Central and southern European countries have ambitious offshore wind plans for 2030, but Bulgaria is lagging behind

Projected 2030 offshore wind installed capacity (GW)



Source: Ember's analysis of multiple sources including National Energy and Climate Plans, Offshore Network Development Plans, Offshore wind in the Baltic States

"In development" includes only projects expected to be commissioned by 2030 and beyond the government target
 *non-binding **by 2035



Bulgaria also needs to make more consistent steps to align with the EU agenda with regard to supporting the regional supply chain, skills development and enabling regulations around wind energy. Although the country endorsed the [Wind Energy Charter](#) in December 2023, it remains one of the two countries that did not actually sign it.

The consensus and vision around growing the role of wind and renewables is a prerequisite to plan the implementation of climate targets, provide clarity for investors and secure social acceptance. To shape this pathway, good practices for offshore wind development can be found across Europe — from Poland or Estonia, where developers are racing to build new offshore wind projects, to the UK and Denmark, where wind farm co-ownership has been instrumental in increasing social acceptance. Bulgaria has a unique opportunity to join these countries in becoming offshore wind leaders, but it needs to move fast to avoid being left behind.

Recommendations

While the first step towards enabling offshore wind in the Black Sea has been taken, several actions need to still be performed until the cheap and clean power from offshore wind starts flowing into Bulgarian homes and businesses.

Ember's recommendations include:

- Speedy adoption of the new offshore wind law to make possible the development of Bulgaria's immense, but so far untapped, offshore wind potential, as soon as 2030.
- A strong focus on ensuring social acceptance of offshore wind on the national and community level, including through proactive communication campaigns and strong legal guarantees for effective social engagement and biodiversity preservation throughout the planning and development of the Offshore Energies Development Plan and for individual investment projects. The political commitment and facilitation of stakeholder dialogues is crucial, including through interregional platforms such as the [Black Sea Renewable Energy Coalition](#).
- Swift introduction of Contracts for Difference to minimise risk for offshore wind projects and decrease price burden for final consumers and catch up with the good practices already implemented in more advanced markets, including the adoption of non-price criteria in CfDs, especially pro-biodiversity focused criteria.
- An update of Bulgaria's National Energy and Climate Plan, with an explicit offshore wind capacity target for 2030.
- Including offshore wind in the transmission grid expansion plan.
- Start planning for a joint Romania-Bulgaria hybrid interconnector connecting both countries and the offshore wind farms.

Supporting Materials

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Cover photo

Pawel Czyzak

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