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National Study on Capacity Gaps in Carbon Management: Emphasizing Carbon Capture and Storage Deployment in Bulgaria

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List of abbreviations

CCUS	Carbon Capture, Utilization, and Storage
CSD	Center for the Study of Democracy
ETS	Emission Trading System
EPG	Energy Policy Group
EU ETS	EU Emissions Trading System
GHG	Greenhouse Gas
GVA	Gross Value Added
MoE	Ministry of Energy
MoEW	Ministry of Environment of Water

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1. Executive Summary

Bulgaria is the EU's most carbon intensive economy with a potential to drastically increase carbon capture and storage capabilities in prominent industries such as cement and chemicals production. Bulgaria has committed under the European Climate Law to reduce greenhouse gas (GHG) emissions by 55% by 2030 and achieve climate neutrality by 2050, with carbon capture, utilization, and storage (CCUS) expected to play a key role in reaching these targets. However, frequent government changes, fragmented institutional coordination, and the absence of a dedicated legal framework have slowed progress toward CCUS deployment. While Bulgaria aligns with EU climate and energy legislation and participates in the EU Emissions Trading System (EU ETS), it has not yet transposed the EU CO_2 Storage Directive into national law or defined responsibilities for site permitting, monitoring, and long-term liability. The Ministry of Environment and Water and the Ministry of Energy share relevant mandates, but overlapping competencies have limited cross-sectoral cooperation. Developing a comprehensive regulatory framework, clarifying institutional leadership, and creating financial instruments to de-risk investments are essential steps to advance CCUS readiness.

At the market level, Bulgaria remains in the early stages of CCUS development. The **ANRAV project**, supported by a €190 million EU Innovation Fund grant and led by Devnya Cement Plant (part of Heidelberg Materials), represents the **country's first full-chain CCS initiative**, expected to capture 0.8 million tons of CO_2 annually for storage under the Black Sea. This pilot project demonstrates both Bulgaria's industrial interest and the potential for regional CO_2 storage cooperation with neighbouring Romania and Greece. However, the absence of CO_2 transport infrastructure, high capture costs (exceeding €120/tCO_2), and limited national incentives constrain private investment. To unlock Bulgaria's CCUS potential, the government should integrate carbon management into its long-term strategic framework, align legal provisions with EU directives, and leverage EU funding instruments such as the Innovation Fund, Connecting Europe Facility, and Just Transition Mechanism. These actions would establish the foundation for a viable CCUS market and position Bulgaria as a regional leader in industrial decarbonisation.

2. Contextual Understanding

2.1. Political Landscape

Under the European Climate Law, Bulgaria has committed to reducing GHG emissions by 55% compared to 1990 levels by 2030 and achieve carbon neutrality by 2050. It is understood that CCUS will be a key component in reaching these targets, particularly for hard-to-abate industrial sectors. However, frequent government changes over the past 5 years have hampered Bulgaria's ability to focus on advancing CCUS projects and caused permitting delays for major energy and infrastructure projects. This political instability delays

progress and risks under-utilizing EU recovery funds that could be put towards the development of CCUS projects.[1]

Bulgaria's political landscape on climate and energy remains shaped by the broader European policy context, including the EU Green Deal, the Fit-for-55 package, and the Net Zero Industry Act (NZIA). Bulgaria is formally committed to aligning its industrial and energy policies with EU climate neutrality targets, but domestic implementation has been slowed by political fragmentation and overlapping ministerial competencies. The Ministry of Environment and Water (MoEW) leads on climate policy and greenhouse gas reporting, while the Ministry of Energy (MoE) oversees energy security, diversification, and infrastructure development. Yet, coordination between these institutions, particularly on cross-sectoral topics such as CCUS, remains limited.

Despite the growing focus on tangible and ambitious targets at EU level, Bulgaria's energy transition process remains limited to expanding renewables in the electricity sector and constructing new nuclear power capacity to replace coal power plants. Even the path to the 2030 energy and climate targets is being compromised, as demonstrated by the updated version of Bulgaria's National Energy and Climate Plan (NECP) in 2024.

The European Commission's assessment of the plan reveals that it lacks ambition, as it does not provide sufficient detail on how and when the country will phase out coal in a just and transparent manner, reduce emissions in sectors other than energy, eliminate energy poverty, liberalise energy markets, deploy carbon capture and sequestration on a large scale, improve energy efficiency, and diversify gas supply. A key EU recommendation is that Bulgaria should provide projections under the planned policies and measures on how the energy system will develop with an outlook to 2040.

At the same time, the government has undermined critical energy sector reforms as a way to appease voters that have been sceptical of the energy transition process largely due to massive disinformation campaign against EU climate policies. Among these is **the liberalisation of the power market without removing controlled household tariffs** or making any direct commitments to close coal power plants. The government's hesitance will keep **coal power plants operational** and maintain state subsidies, likely weakening the development of clean technologies in the coal regions that are already more cost-effective, such as solar, wind energy, battery storage and green hydrogen.

Even though Bulgaria is among the most vulnerable EU member states to persistent energy poverty risks, the development of the National Social Climate Plan and the introduction of the Emission Trading System (ETS 2) have received very little political attention. While the uptake of renewables is accelerating at the expense of a shrinking share of coal in the energy mix, the decarbonisation of the industry, transport and buildings sectors remains

[1] European Bank for Reconstruction and Development, Bulgaria Country Strategy 2025-2030, 2025.

slow. This reflects weak policy incentive for local businesses to invest in cleaner technologies and optimised processes.

2.2. The Role of CCUS

The government has identified CCUS as a potential tool for industrial decarbonisation in hard-to-abate sectors, such as cement, steel, and oil refining, but it has not yet integrated CCUS into its long-term strategic plans or established a dedicated institutional framework to manage geological storage, transport infrastructure, or long-term liability.

Political discussions around CCUS are nevertheless beginning to gain traction although this cutting-edge low-carbon technology remains politically underexplored compared to renewables and nuclear energy. Policymakers often cite a lack of geological data, uncertainty around public acceptance, and the absence of clear EU-level financing streams as reasons for the limited attention to this nascent sector.

From an institutional perspective, high-level coordination of energy and industrial transformation projects is overseen by the Council for Sustainable Development under the Council of Ministers, but climate-specific technology deployment, such as CCUS, has yet to be prioritized within this forum. Future progress will depend on Bulgaria's ability to designate a lead ministry or inter-ministerial task force responsible for carbon management policy integration, supported by scientific institutions like the Bulgarian Academy of Sciences and the University of Mining and Geology.

While public awareness of CCUS remains low, industrial stakeholders, particularly in the cement and energy sectors, have begun exploring the feasibility of potential pilot projects, especially if supported by EU funding opportunities under the Innovation Fund or Just Transition Mechanism.

2.3. Legislative Framework

Bulgaria is part of the EU Emissions Trading Scheme (EU ETS), which provides a foundation for CO_2 monitoring and pricing, which is critical to the CCUS viability. Nonetheless, concrete policy provisions are lacking. **Bulgaria has not yet transposed the EU CO_2 Storage Directive** (Directive 2009/31/EC) into national law in a comprehensive manner. There are currently no legislative provisions addressing site exploration, licensing, monitoring, or long-term liability for CO_2 storage. The absence of such a framework creates uncertainty for potential project developers and investors.

To align with EU requirements and facilitate future CCS deployment, Bulgaria will need to develop a dedicated legal and regulatory framework that defines clear responsibilities for competent authorities, establishes transparent permitting and liability procedures, and outlines standards for site selection, operation, and closure. A first step could be the amendment of the existing Law on Environmental Protection or the Law on Subterranean

Resources to incorporate CCUS-related provisions, following the example of Latvia's 2025 legislative approach.[2]

Moreover, Bulgaria could adopt secondary legislation to regulate CO_2 transport and cross-border storage, particularly in light of **regional infrastructure development** such as the **Vertical Gas Corridor** and **potential connections to offshore CO_2 storage sites in the Black Sea**. Coordination with neighbouring countries and the European Commission will be essential to ensure regulatory interoperability and compliance with EU and international frameworks.

Institutionally, Bulgaria would benefit from designating a national lead body for CCUS development, potentially within the MoEW or the MoE, to coordinate policy implementation, oversee geological surveys, and manage stakeholder engagement. This should be accompanied by the creation of co-financing and de-risking mechanisms to stimulate private investments.

2.4. Industry Profile

Reducing the energy and carbon intensity of the industrial sector is one of the biggest challenges on Bulgaria's path to climate neutrality. A deep transformation of the sector will require a combination of material efficiency, improved circularity, and the introduction of low-carbon technologies and fuels. However, the current energy and climate strategic framework does not meaningfully address the industrial sector, resulting in the absence of adequate and concrete policy measures even as some of the country's most prominent and economically vital industries, including chemicals, petroleum products and non-metallic minerals, are also its most carbon-intensive. Currently, **industry accounts for around 20% of Bulgaria's total GHG emissions**, a proportion which is expected to increase in the future due to anticipated growth in industrial production alongside a decline in energy sector emissions driven by current decarbonisation policies targeting this sector and the consequent expansion of renewables.[3]

In 2018, Bulgaria's material footprint surpassed the EU average for the first time and has remained above average ever since due to growing private consumption combined with low material efficiency and recycling rates.[4] Bulgaria has the sixth lowest circular material use rate in the EU, but significant differences exist between sectors. For example, Bulgaria does not produce any primary steel; Stomana Industry, a major steel producer, already manufactures its products using 99% recycled scrap melted in electric arc furnaces. Meanwhile, aluminium producer Alcomet completely reuses any aluminium and foil scrap generated during production, and copper producer Aurubis has set a target of achieving a

[2] Bellona, Latvian Parliament Lifts Ban on CO2 Storage in Geological Formations, 2025.

[3] Center for the Study of Democracy. *Fit for 2040*. Sofia, 2025

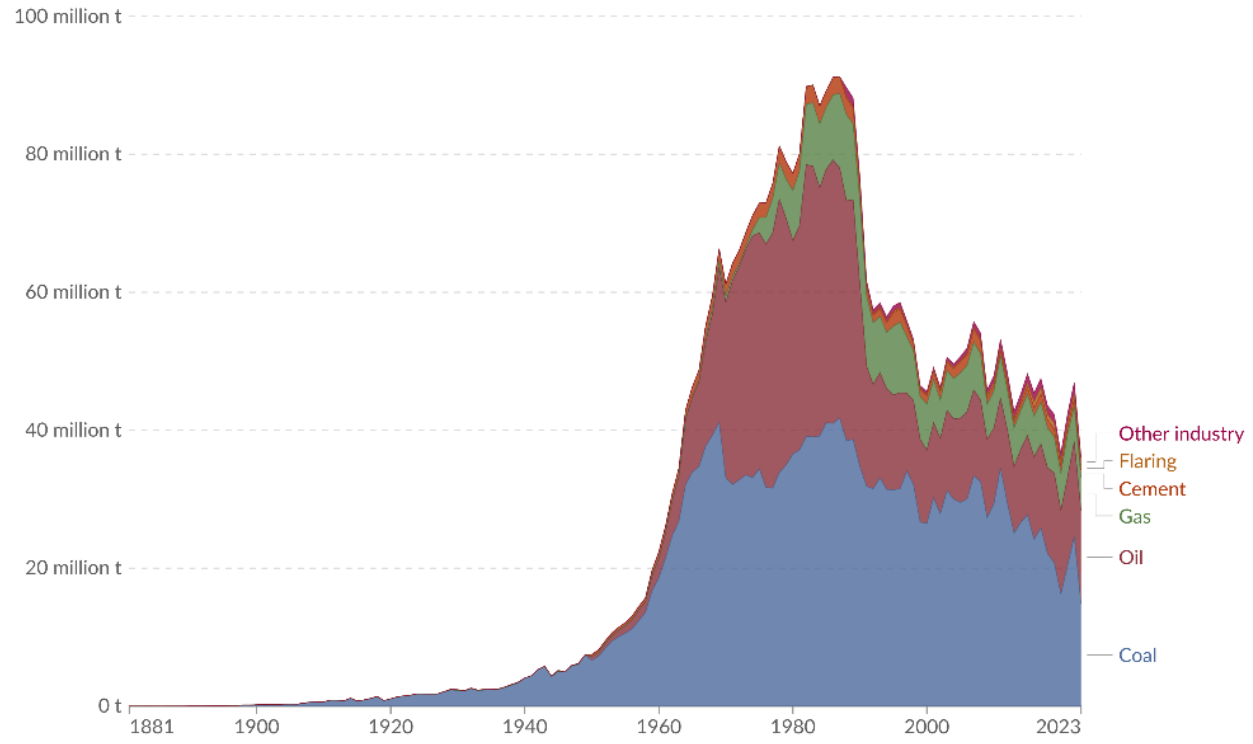
[4] Center for the Study of Democracy, *Energy and Climate Security in Europe: From Crisis Response to Structural Transformation*, Sofia, 2025.

50% copper recycling rate by 2030.[5] These examples demonstrate that circularity is technically feasible, but unevenly applied across the industrial base.

2.4.1. Current Share of Emissions - Sector Breakdown

In 2024, Bulgaria's industrial emissions increased by 4.3% compared to 2023 levels, although they remained 11.6% below the 2019 peak. The chemicals subsector is particularly carbon-intensive, emitting 12.5 kg of GHGs for every euro of GVA. For glass and cement, this figure is 8 kg/EUR, and for petroleum products, it is 3.3 kg/EUR. The high carbon intensity of these industries exposes them to significant financial risks. Due to EU regulations, the number of freely allocated carbon allowances has steadily declined, while the EU carbon price has risen sharply.

Figure 1. CO2 Emissions in Bulgaria by Sector



Source: Hannah Ritchie, Max Roser, and Pablo Rosado, "*CO_2 and Greenhouse Gas Emissions*", 2024.

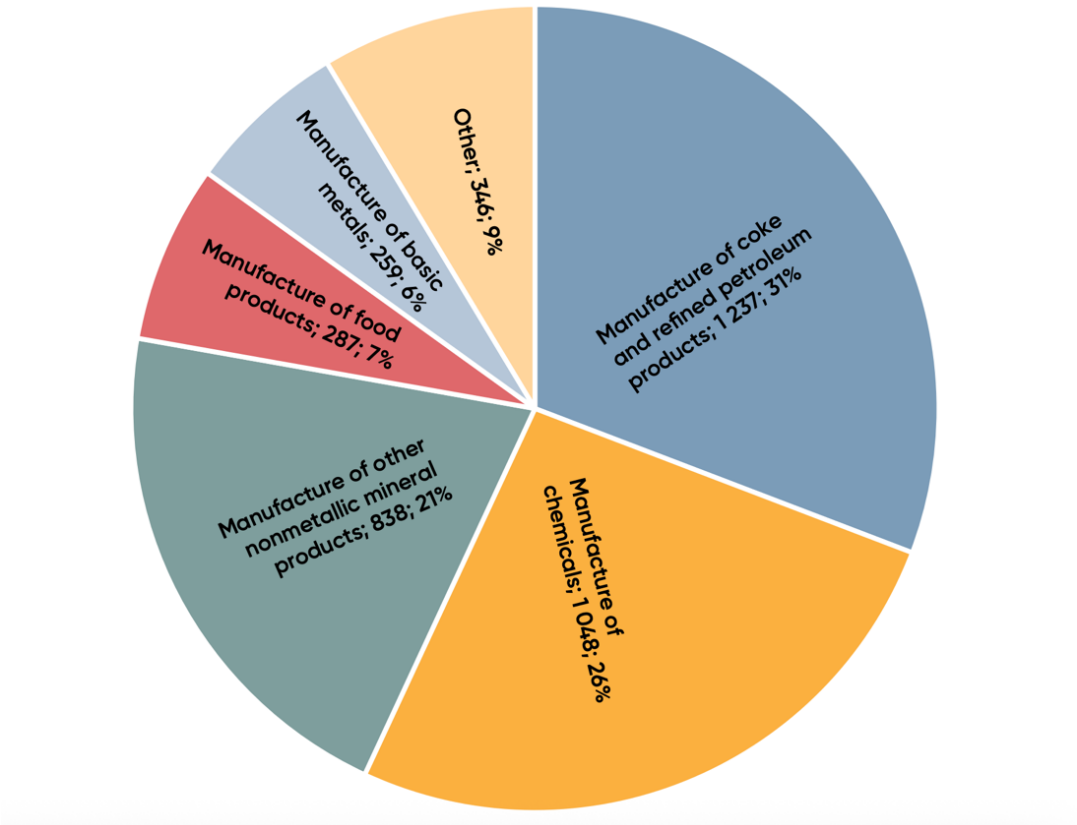
Bulgarian industrial installations must increasingly pay for their emissions. In 2024, for example, 16% of industrial emissions had to be covered at an average cost of 65 EUR/ton, resulting in extra carbon costs totalling around EUR 70.4 million. The highest carbon costs were incurred by producers of ferrous metals, glass, ammonia, soda ash, and petroleum

[5] Philipova, I., "Aurubis Bulgaria investing 120 million euro to boost copper cathode production", Kapital, 1 April 2023.

products[6] – all of which are known for their high energy and emissions intensity. Conversely, industries such as copper, paper and pulp face lower carbon costs due to higher levels of electrification. The production of non-metallic minerals, particularly cement and glass, accounts for a significant proportion of Bulgaria's industrial emissions. While these industries provide significant employment, particularly in rural areas, they are also among the country's worst polluters.

For example, **three major cement plants are among the ten most polluting industrial facilities** in Bulgaria.[7] Similarly, several glass plants, including those operated by BA Glass Bulgaria and Trakya Glass Bulgaria, are among the country's most carbon-intensive industrial installations. Some of these plants emit more GHGs than certain combined heat and power plants. This illustrates the difficulty of balancing economic importance with the need for deep decarbonisation.

Figure 2. GHG Emissions in Manufacturing, Excluding Feedstock (ktCO2e and % of total)



Source. CSD based on Eurostat Data.

[6] European Environment Agency, "EU Emissions Trading System (ETS) data viewer", Accessed on 26 September 2025.

[7] Climate Trace, "Independent Greenhouse Gas Emissions Tracking", Accessed on 26 September 2025.

The chemical and petrochemical industries constitute another major source of industrial emissions due to their extensive use of natural gas as a feedstock for many products. As a result, these sectors combine high energy-related emissions with structurally embedded process emissions, making them particularly challenging to decarbonise. **Neochim**, a fertiliser producer in Haskovo, **is Bulgaria's single largest industrial emitter, with emissions surpassing those of the combined road transport of Plovdiv, Varna, and Burgas**. Similarly, ADM Razgrad, a major corn processing company, is the largest polluter in its province and the seventh most carbon-intensive industrial facility in the country, despite being a key employer and sector leader.

Bulgaria is also a major player in the European copper market, holding some of the continent's largest copper reserves and ranking as the third-largest producer in the EU. This has led to a robust supply chain within the country, including manufacturers of copper cables and automotive wiring systems. Although the process of mining, refining and processing copper is energy intensive, the sector's high level of electrification makes it ideal for decarbonisation through the use of large-scale renewable energy and electric mining equipment. Anticipated growth in low-carbon equipment industries will ensure the continued expansion of this sector, making decarbonisation a crucial pathway for the Bulgarian economy. However, efficient use of materials and circularity remains a challenge.

2.5. Market conditions

Deployment of CCS in Bulgaria is at a very early stage of development. There is interest in carbon neutrality, especially in sectors that are good candidates for CCUS, but there is limited infrastructure to support these projects. Bulgaria currently lacks a CO_2 transport network, and no geological storage sites have been officially certified under the EU CO_2 Storage Directive, serving as key barriers to market creation.

2.5.1. The ANRAV Project

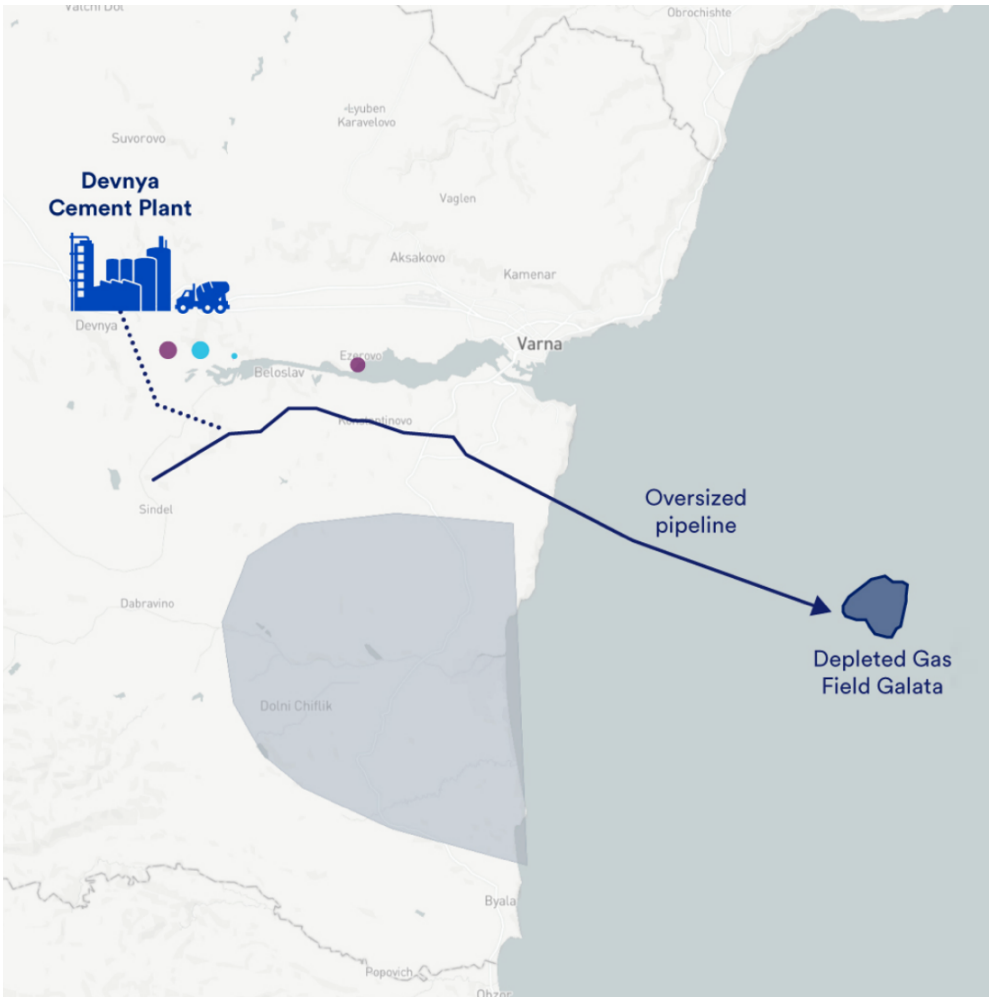
Against this backdrop, the ANRAV project stands out as a significant milestone and a key pilot initiative.[8] Supported by a EUR 190 million grant from the Innovation Fund, the ANRAV project will be **Bulgaria's first full-chain CCUS operation**[9], targeting an annual capture of **0.8 million tonnes of CO_2** at the Devnya Cement Plant (part of Heidelberg Materials). Captured CO_2 will be transported via an onshore and offshore pipeline system for storage in the Galata depleted offshore gas field in the Black Sea, with construction launched in 2023 and completion expected by 2028. It should be noted that despite the EU investment, the CCUS technology remains expensive, especially for retrofits in cement, with estimates exceeding €120/tCO_2 for cement operations, which may deter early adopters unless new policy assists in bridging cost gaps.[10]

[8] https://anrav.bg/en/

[9] Hiedelberg Materials, *Major step towards full-scale CCUS in Eastern Europe: Heidelberg Materials starts carbon capture pilot in Bulgaria*, 2024

[10] Clean Air Task Force, *Tracking progress: Europe's 2023 carbon capture projects*, 2023.

Figure 3. The ANRAV Map



Source: Clean Air Task Force, *Carbon Capture & Storage in Bulgaria*, 2023.

Several studies have identified potential storage capacity in depleted hydrocarbon fields and deep saline aquifers located both onshore (in the Moesian Platform) and offshore (in the Black Sea).[11] These formations could provide a foundation for future regional CO_2 storage infrastructure, potentially linking Bulgaria with neighbouring Romania and Greece. Existing oil and gas pipelines can also be repurposed to reduce future infrastructure costs.

From a financing perspective, there are no national mechanisms or economic incentives specifically supporting CCUS deployment in Bulgaria. The country relies primarily on EU-level instruments such as the Innovation Fund and Horizon Europe. The ANRAV project demonstrates the feasibility of leveraging EU resources for domestic CCUS development and could serve as a model for additional projects in industrial clusters around Sofia, Plovdiv, and Varna. Bulgaria could potentially also benefit from future inclusion in cross-

[11] Oil and Gas Climate Initiative, CO2 Storage Resource Catalogue Cycle 4 Report, 2024

border CCUS value chains in the Black Sea region, particularly if regional CO_2 transport infrastructure emerges.

At present, the economic case for CCUS in Bulgaria remains weak. The current EU ETS price, ranging from 70–80 EUR/tCO_2 as of late 2025, still falls below the average cost of capture, transport, and storage for most industrial facilities. Consequently, the deployment of CCUS technologies will depend on the creation of de-risking mechanisms, targeted state aid schemes, and stronger market signals for low-carbon industrial products. Without such measures, private sector investment is unlikely to materialize at scale.

In the near term, Bulgaria's focus should be on **building technical readiness, completing geological storage assessments, and developing policy instruments to attract early movers**. Establishing a transparent permitting and monitoring regime, combined with participation in regional infrastructure planning, would enable Bulgaria to gradually develop a viable CCUS market and align with EU decarbonisation pathways by 2030 and beyond.[12]

2.6. Public Perception

This section will be further developed after the results from the public survey are analysed and published in November 2025.

[12] Center for the Study of Democracy, *Low Carbon Technologies: Roadmap for Deployment in Bulgaria by 2050*, Sofia, 2024.

3. Contextual Understanding

3.1. Identification of Stakeholders

Stakeholders involved in the CCUS framework include a range of national, regional, and local authorities, as well as private and non-governmental organizations. Effective CCUS deployment will depend not only on broad stakeholder involvement, but on clear leadership, coordination, and trust-building across these actors.

- At the national level, the MoEW, the MoE, the Ministry of Economy, and the Ministry of Innovation and Growth will be involved. These ministries play a key role in expanding CM policies and implementation of projects.
- At the regional level, development agencies in the regions of Stara Zagora, Varna, and Gabrovo should be involved. These districts can incorporate CM policies into their regional developmental strategies.
- At the local level, the municipalities of Varna and Devnya will be involved in the targeted deployment of CM. Localities are useful in capacity building and gaining trust among the public for CM implementation.
- Civil society organizations, including Greenpeace Bulgaria, WWF, Za Zemiata, Energy Management Institute, and E3G, demonstrate expertise on the topic. These organizations are useful in helping the public understand CM projects and spreading useful information about CM. Additionally, citizens from regions where CM will be deployed must be engaged to help communication activities in the surrounding regions and gain public support.
- Industry experts from relevant industries such as cement and chemicals can help build technical understanding and support informed policy and investment decisions.

3.2. Role Clarification

National Authorities

- Ministry of Environment and Water: Regulates permitting, environmental impact assessments, and alignment with the EU CCS Directive. Acts as the lead authority for environmental compliance and long-term liability oversight.
- Ministry of Energy: Defines the national energy strategy, sets priorities for carbon management integration in power and industrial sectors, and supports infrastructure planning.
- Ministry of Economy: Provides incentives for industrial decarbonisation, oversees competitiveness, and connects CM policies with industrial modernization.
- Ministry of Innovation and Growth: Supports R&D funding and innovation programs relevant to CM technologies, including access to EU funds.

Regional Authorities

- Regional Development Agencies (Stara Zagora, Varna, Gabrovo): Integrate CM into regional development strategies, support siting of infrastructure, coordinate regional

investment planning, and act as intermediaries between municipalities and national ministries.

Local Authorities

- Municipalities (Varna, Devnya): Implement CM projects on the ground, facilitate permitting at the local level, engage directly with communities, and manage land-use/zoning issues.

Civil Society & NGOs

- Greenpeace Bulgaria, WWF, Za Zemiata, Energy Management Institute, E3G: Provide independent expertise, shape public discourse, raise awareness, and ensure transparency and accountability in CM projects. They act as facilitators for early-stage community engagement and trust-building.

Industry Stakeholders

- Cement and chemical industries (e.g., Devnya Cement, chemical plants): Core emitters and early adopters of CCUS. Responsible for integrating capture technology, coordinating with storage operators, and ensuring technical/economic viability.
- Industry experts & technology providers: Supply technical expertise, carry out feasibility studies, and support infrastructure design and operation.

Communities and Citizens

- Local populations in deployment areas: Provide input during consultation processes and influence public acceptance.
- Community groups: Ensure equitable distribution of benefits and risks, contribute to monitoring and trust-building.

4. Resource Availability

4.1. Financial, Human and Knowledge Resources

There are currently no national funding mechanisms for CCUS. As mentioned, the ANRAV project received funding from the EU Innovation Fund, as well as from direct capital investments. There is no state funding allocated solely for CM implementation. This reliance on EU-level funding constrains scalability, but also increases the strategic importance of early pilot projects as learning platforms.

Heidelberg Materials is aiming to trial new OxyCal technology for the ANRAV project, an innovative carbon capture technology based on the addition of pure oxygen to the clinker burning process, which will help the company collect operational data on capture technologies, providing a blueprint for future CCUS projects in Eastern Europe. ANRAV will

become a knowledge platform to implement future CCUS projects in Bulgaria and contribute to emissions reduction.

4.2. Technical Resources

Due to the lack of active CCUS projects, there is a lack of available site-specific data and modelling.[13] This can increase the timeline for implementation for future projects and create delays. Additionally, Bulgaria does not currently have any processes in place for approving permits for potential projects, no pre-selected storage sites, and no issued exploration permits.[14]

5. Analysis

5.1. Evaluation of Objectives

Bulgaria remains at an early "readiness" stage for CCUS deployment. Political commitments exist at the national level, but regulatory preparedness, market conditions, and public participation remain underdeveloped across governance levels.

	Objective	National	Regional	Local
Political Landscape	Ambitions and commitments towards climate targets and the role of CCS			
	Evaluation of CM/CCS for national climate strategy/ CM/CCS strategy			
Legislative	Status of implementation of legislation and regulation governing CM and CCS			
Market Conditions/ financial	Support instruments for CM/CCS			
	Market development for CM/CCS			
	Barriers to market entry for companies developing CM/CCS projects			
Public Participation	Existing public understanding of CCS			
	Current public attitudes towards CCS initiatives			
	Activities towards public participation			
Role clarity	Clear roles and responsibilities			
	Conflicts in stakeholder interaction			
Financial	Availability of financial resources for CM/CCS projects			

[13] CO2 Storage Resource Catalogue Cycle 4 Report EUROPE July 2024.

[14] European Commission, *Member State report on Implementation of Directive 2009/31/EC on the geological storage of carbon dioxide ("CCS Directive")*, 2023.

	Availability of human resource capacity for CM/CCS			
	Availability and use of Knowledge resources for CM/CCS implementation			
	Barriers to resource availability			
Technical Resources	Available CCS technologies			
	Availability of infrastructure for CCS			
	Availability of storage facilities			
	Data collection and management systems			

Legend:

Ready for CCS implementation	*started*	*Not yet started*	*Not relevant*

5.2. Regulatory and Compliance Assessment

Bulgaria does not yet have a comprehensive regulatory and compliance framework for CCUS. While the ANRAV project has been approved as a standalone initiative, Bulgaria has not fully transposed the EU CO_2 Storage Directive into national law, leaving key aspects of CCUS deployment, such as permitting, monitoring, institutional responsibilities and long-term liability, insufficiently defined. To comply with EU requirements and support wider deployment, Bulgaria will need to establish a dedicated legal framework covering the full CCUS value chain. Without such reforms, CCUS is likely to remain peripheral, constraining the decarbonisation of hard-to-abate industrial sectors and the achievement of long-term climate objectives.

5.3. Geographical impact mapping

	Zlatna Panega	Devnya	Pernik
CM/CCS industries (e.g., cement industry, waste incineration, chemical industry)	Cement	Cement, soda ash	Steel
Local demand (e.g., hydrogen production)	To be determined	To be determined	To be determined
Storage capacity	To be determined	To be determined	To be determined
Availability of infrastructure	None	None	None
Stakeholder interest (e.g., project developers, industry)	To be determined	To be determined	To be determined
Public perception	To be determined	To be determined	To be determined

Figure 4. Emission-Intensive Industry Locations Suitable for CCS Deployment in Bulgaria

Source: CSD

6. Transfer of Findings

6.1. Transfer Findings to project chain

Bulgaria is currently in a planning phase for CCUS deployment, with only the ANRAV project near the implementation phase. To continue to implement additional CCUS projects, Bulgaria must address gaps throughout the project chain.

Planning phase:

1. Geological exploration

Comprehensive geological surveys and exploration are needed to enhance understanding of subsurface formations suitable for CO_2 storage to identify future project sites. These efforts are essential to determine the technical feasibility, capacity, and safety of potential storage sites, as well as to inform the planning of CO_2 transport infrastructure. Bulgaria will need to identify which institutions will be responsible for this effort to advance CCUS deployment.

2. Capacity Building

To ensure successful CCUS implementation, public sector institutions and stakeholders need to be trained and informed on CCUS technologies and strategy. This will be important during the deployment stage of CCUS implementation, as it will be important to have stakeholders who can participate in the process and provide input.

3. Complete Regulatory Framework

To continue to successfully implement CCUS, Bulgaria must develop legal and regulatory framework to guide future projects. Regulations should be aligned with the EU CO_2 Storage Directive. Additionally, Bulgaria needs to implement a CCUS roadmap to guide further development and set national goals for implementation.

Construction phase:

Implement Streamlined Regulatory and Permitting Processes

There is a lack of a regulatory and permitting processes for CCUS projects, which creates delays and disorganization during project implementation. Bulgaria needs to create a process to ensure future CCUS development is not saddled with delays due to regulatory issues.

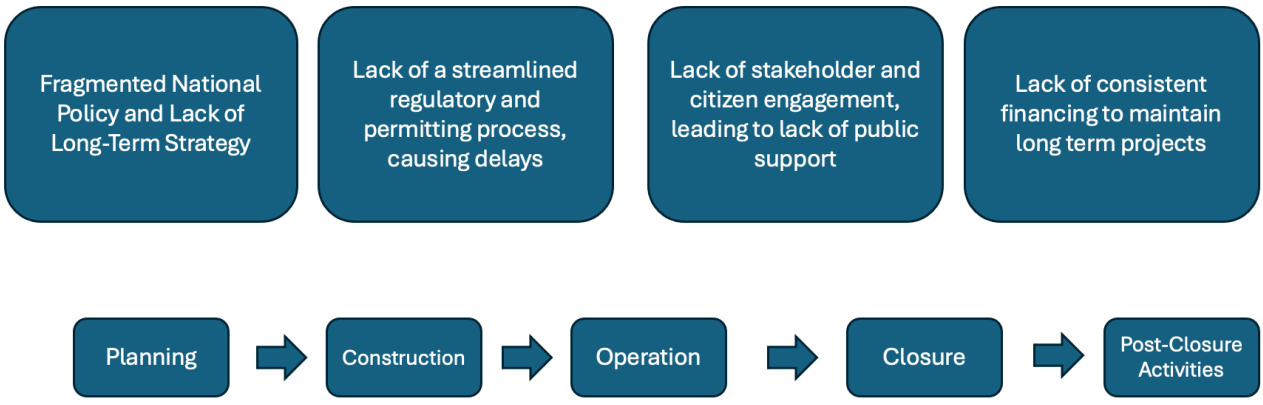
Operation phase:

Implement a National CCUS Strategy to Ensure Long-term Support

CCUS development in Bulgaria is limited due to many uncertainties in both financing opportunities and the business market. The government needs to establish co-financing mechanisms outside of available EU funding and clarify regulations on deployment and management of CCUS projects. By improving certainty for CCUS deployment, more developers and investors may be interested in pursuing future CCUS projects, increasing the likelihood of future projects.

Closure phase:

Bulgaria currently lacks regulations governing the closure and post-closure phases of CCUS facilities. Establishing clear and comprehensive rules in this area would provide developers and operators with well-defined procedures for project completion and long-term site management. These regulations should be fully aligned with relevant EU directives to ensure consistency, environmental safety, and investor confidence.



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