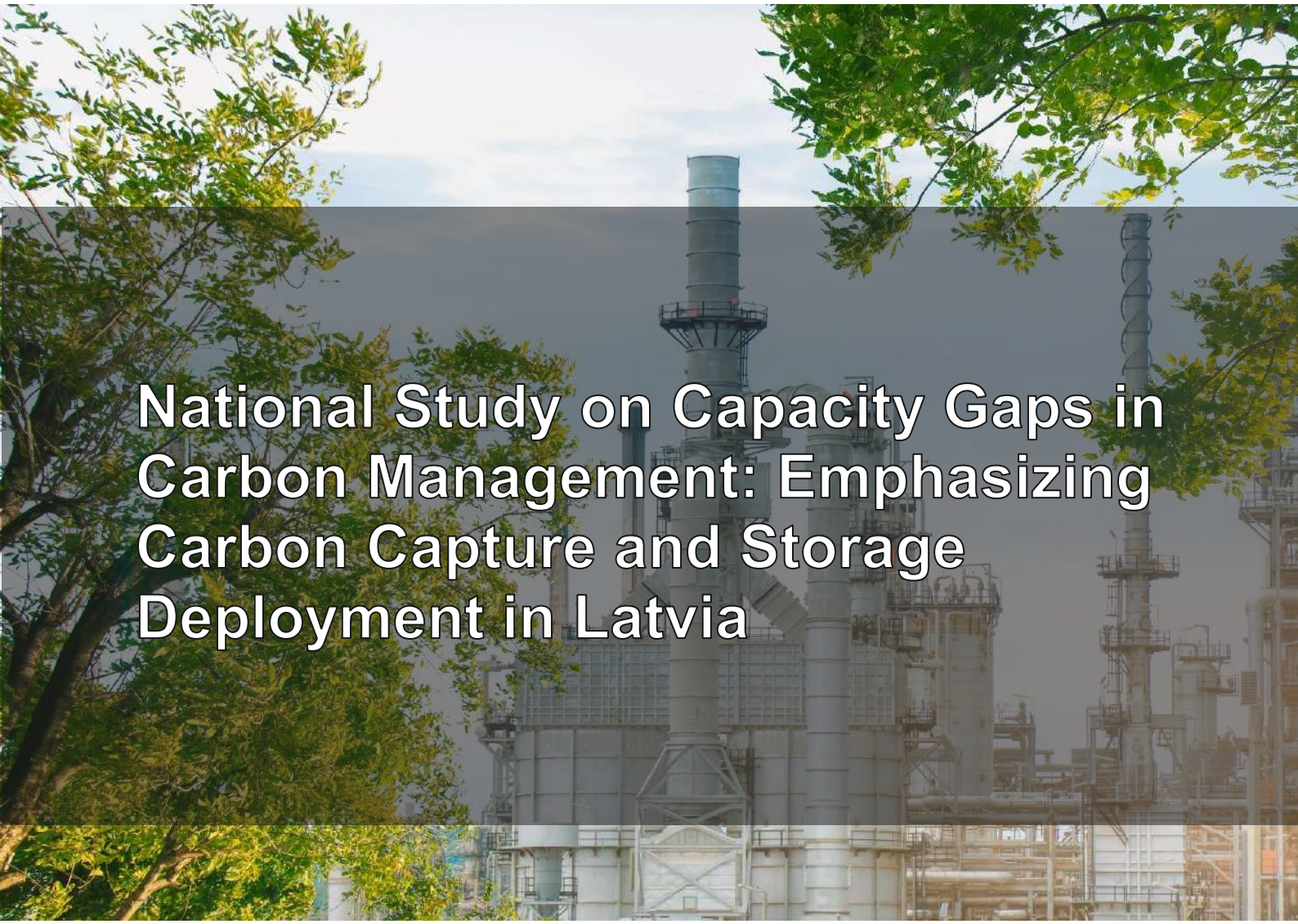
Green Horizon

Supported by:

Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety

European Climate Initiative EUKI

on the basis of a decision by the German Bundestag



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

EPG

CSD CENTER FOR THE STUDY OF DEMOCRACY

BELLONA EUROPA

WiseEuropa

Expert Partner

Fraunhofer

Please cite as

Bellona Europa (2025). National Study on Capacity Gaps in Carbon Management: Emphasising Carbon Capture and Storage Deployment in Latvia. Bellona Europa Reports, October 2025

A study by

Bellona Europa

Janis Volberts

Janis@bellona.org

Authors

Janis Volberts, Baltics Manager, Bellona Europa

Acknowledgments

For reviewing - Dr. Alla Shogenova, BASRECCS Board member, TalTech Senior Researcher

Disclaimer

Contents

List of abbreviations

CM	Carbon Management
CCS	Carbon Capture and Storage
CCU	Carbon Capture and Usage

List of tables

List of figures

Executive Summary

Latvia's National Energy and Climate Plan[i] (NECP) see a role for carbon capture and storage (CCS) in contributing to reducing greenhouse gas emissions (GHG) emissions in large industrial production as well as within its electricity and heat generation sector. A decarbonisation obligation applies to heat and electricity generation installations with a total capacity of more than 100 MW (currently no more than 5 installations in Latvia) and largest industrial production operators which, due to the nature of their production, cannot reduce industrial process. The Plan also states that any new natural gas combustion installations for district heating or industrial plants should only be permitted if combined with carbon capture technology or other low-carbon solutions.

The Latvian government is currently taking steps to develop a regulatory framework for CCS deployment, signaling openness to support industrial decarbonisation. Although the key laws have been amended lifting ban for CO_2 storage in Latvia, the regulatory process is still ongoing to develop and adopt Cabinet regulations for CO_2 transportation and storage in line with the EU CO_2 Storage Directive.

Latvia's geological formations offer a number of promising porous underground structures suitable for CO_2 storage. Nevertheless, further exploration and site assessment are required to advance licensing processes and enable infrastructure planning.

At present, no CO_2 transport infrastructure exists in Latvia at a scale suitable for carbon management (CM) projects.

Public perception of CM in Latvia remains undeveloped, as the topic has received minimal media attention and lacks broader public discourse. To date, most public-facing discussions have been initiated by cement producer Schwenk Latvia, underscoring the need for greater public awareness and targeted communication as the sector evolves.

In this analysis the following main gaps have been identified across governance, administrative capacity, public engagement, financing, and workforce development in Latvia.

Policy and Governance: While important legislative steps have been taken in 2025 to align with the EU CO_2 Storage Directive, Latvia still lacks a designated lead institution for CCS and clear inter-ministerial coordination. Key responsibilities at regional and local levels remain undefined, making integrated planning difficult.

Administrative Capacity: Ministries and agencies face capacity constraints, with limited staff and technical expertise to manage permitting, oversight, and long-term monitoring of CCS projects.

Public Engagement: Public awareness of CCS remains low, with discussions so far driven mainly by industry actors such as Schwenk Latvia. Broader stakeholder engagement and transparent communication will be needed to build understanding and trust.

Financing: No dedicated national funding is allocated to CCS. References in the Latvian NECP point only to EU-level instruments, such as the Innovation Fund, leaving significant uncertainty about domestic co-financing and investment frameworks.

Research and Workforce Development: Latvia lacks strong geological expertise, academic and technical initiatives remain fragmented. More recent and nuanced geological research expertise in CM development comes from Estonia and Lithuania. There is no national strategy to develop the skills base required for sub-surface resource management, including large-scale CCS deployment.

To address these gaps, Latvia should establish a clear governance framework with a designated lead institution, strengthen administrative and technical capacity, and develop a national communication strategy. Dedicated financing mechanisms and a coordinated skills agenda would further position CCS as a credible pillar of Latvia's decarbonisation pathway.

1. Contextual Understanding

1.1. Political Landscape

The European Union is steadily advancing an integrated climate and industrial policy framework aimed at achieving its legally binding target of climate neutrality by 2050. At the core of this approach is the commitment to align emissions reduction efforts with industrial competitiveness, innovation, and energy market integration. Recent EU-level policy updates reflect a consistent political focus on ensuring regulatory certainty, mobilising financial instruments, and offering strategic guidance to support member states and industries in their low-carbon transition.

A key tool in the EU's climate policy architecture is the EU Emissions Trading System (EU ETS), operating since 2005 as the primary market-based mechanism to reduce greenhouse gas emissions in the power and industrial sectors. Under the ETS, regulated entities must purchase carbon allowances—currently (October 2025) priced between €70 and €80 per tonne[ii]—to account for their verified emissions. ESG economists' projects EU ETS prices rise to €145/tCO_2 by 2030 and €200/tCO_2 by 2035[iii]

The latest ETS revision introduces a gradual phase-out of free emission allowances for industrial sectors by 2034, thereby increasing pressure on emitters to adopt advanced mitigation technologies. CCS will play a critical role in this context. Integrated into the ETS since 2009, the system recognises CO_2 that is captured and permanently stored in accordance with the CO_2 Storage Directive (also known as the CCS Directive) as "not

emitted," thus exempting such volumes from allowance surrender. However, any emissions released during transport or storage must be fully accounted for within the ETS.

The EU CO_2 Storage Directive[iv] (2009/31/EC) provides the legal foundation for safe and responsible CO_2 storage, outlining stringent requirements for site selection, risk management, monitoring, and long-term liability. The supporting guidance documents were most recently updated in 2024 to reflect evolving best practices and ensure consistency across member states.

The Clean Industrial Deal[v] (CID), published by the European Commission in February 2025, reinforces the EU's strategic direction by closely linking industrial resilience with climate action. As part of the broader Competitiveness Compass, the CID supports decarbonisation through targeted measures for affordable clean energy, sustainable public procurement, and workforce upskilling. Crucially, it also seeks to strengthen the business case for permanent carbon removals, broaden the recognition of captured CO_2 in industrial products, and address double-counting challenges in advance of the 2026 EU ETS review.

The regulatory framework for environmental safeguards related to CCS is underpinned by two key directives. The Environmental Liability Directive ensures that operators are held financially responsible for environmental damage caused by CO_2 storage activities—excluding climate impacts, which are addressed under the EU ETS. Complementing this, the Environmental Impact Assessment Directive requires a thorough environmental review of CO_2 capture, transport, and storage projects. This includes ex-ante assessments, public consultations, and regulatory oversight to ensure transparency and minimize environmental risks.

The EU's industrial decarbonisation agenda is further advanced by the Net Zero Industry Act[vi] (NZIA), which establishes a framework to accelerate domestic deployment of key net-zero technologies, including CCS and CCU. Under Article 17 of the NZIA, all geological data for geological structures where CO_2 storage sites can be permitted are publicly available. Under Article 23 of the NZIA, oil and gas producers have the obligation for individual contribution to support the EU-wide CO_2 injection capacity by 2030 targets. Although no Latvian entities are listed under NZIA CO_2 injection obligation, Latvian territory is a potential candidate to host storage by foreign entities who are obliged to develop permanent CO_2 storage.

For national policymakers, these instruments collectively form a robust legislative and strategic foundation to support industrial decarbonisation while maintaining competitiveness.

In 2013 when Latvia transposed the EU CO_2 Storage Directive, Latvian government decided to ban CO_2 storage by the Article 8.^{2} of the Law on Pollution, arguing that the technology had not yet been demonstrated in Europe and that the identified geological structures could be used for additional natural gas storage or future geothermal energy production. Finally,

in October 2025, after sustained pressure from relevant stakeholders, the law was amended, and the ban on permanent CO_2 storage in Latvia was lifted[vii].

Furthermore, Latvian government has supported the PCI application from CCS Baltic Consortium where Schwenk Latvia participates aiming to develop full CO_2 sequestration chain.

According to the NECP, Latvia sees a role for CCS in contributing to reducing GHG emissions in large industrial production as well as within its electricity and heat generation sector. According to the NECP, a decarbonisation obligation applies to heat and electricity generation installations with a total capacity of more than 100 MW (currently no more than 5 installations in Latvia) and largest industrial production operators which, due to the nature of their production, cannot reduce industrial process emissions (currently 1-2 installations in Latvia). The Latvian NECP mentions carbon capture installations as one option for GHG emission reduction within those sectors and notes that technological feasibility and cost-efficiency must be considered, when aiming to reduce emissions from installations by up to 90 % compared to 2021 levels. Latvian NECP also states that any new natural gas combustion installations for district heating or industrial plants should only be permitted if combined with carbon capture technology or other low-carbon solutions.
In Latvia, high-level institutional coordination on carbon management is to some extent overseen by the Large and Strategically Important Investment Project Coordination Council, chaired by the Prime Minister. The Council's secretariat is provided by the Investment and Development Agency of Latvia, and most of its proceedings remain confidential.

At present, while this report is being developed, Latvia's political landscape on climate action remains highly polarized. This is largely due to competing priorities—such as the urgent need to increase defense spending and capacities—as well as deeply divided and often emotional debates surrounding certain energy transition solutions, particularly offshore and onshore wind energy projects. That puts at risk and complicates the new climate legislation adoption process, e.g. the proposed Law on Sustainable Economy has been very sensitive and difficult to find agreement among politicians.

At the same time, on 28 August 2025, Schwenk Latvia officially opened its carbon capture test facility with the presence of Prime Minister Evika Siliņa, Parliamentary Secretary of the Ministry of Climate and Energy Jānis Irbe, and numerous other high-level guests, including political representatives. The event highlighted strong political support for CCS projects within one of Latvia's major industrial companies.

1.2. Legislative Framework

Directive 2009/31/EC of the European Parliament on the geological storage of carbon dioxide entered into force on June 25th, 2009. By the end 2013 the EU CO_2 Storage Directive has been transposed into national law to the satisfaction of the EC in 20 out of 28 EU Member State, including Latvia.[viii] However, despite formal transposition Latvia's *Law on Pollution* included a provision explicitly prohibiting CO_2 storage, effectively blocking CO_2 storage activities.

With strong demand from industry and regional climate organizations, including Bellona Europa and BASRECSS[ix], in 2025, Latvia is actively working to align its legal framework with the requirements of the CO_2 Storage Directive in full capacity, particularly including Articles that refer to the CO_2 permanent geological storage and administration of safe CO_2 storage. A major milestone was reached on 3rd April 2025, when Latvian Parliament amended the **Law on Subterranean Depth**, which entered into force from 1st July 2025. These amendments, for the first time, define key elements of geological CO_2 storage in Latvian law—including provisions for site exploration, licensing, operation, closure, and long-term stewardship. They also mandate the Cabinet of Ministers to develop detailed regulations on operator responsibilities, third-party access to storage sites, and dispute resolution procedures, although by the time this report is finalized, there are no updates on the progress of this.

Until 9th October 2025, Article 8.2 of **the Law on Pollution** prohibited CO_2 storage in Latvia's territory, exclusive economic zone (EEZ), and continental shelf. Draft amendments lifting this ban were submitted to the responsible parliamentary committee on 4 April 2025. The revised law at the Latvian Parliament was adopted on 9th October 2025 providing a clear legal basis for CO_2 storage in full compliance with the EU CO_2 storage Directive.

Transport and Cross-Border CO_2 Movement

Latvia already has in place Cabinet Regulation No. 780 (adopted in October 2011) on the Arrangements for Transporting Carbon Dioxide Flows. This regulation addresses access to CO_2 transport infrastructure, including pipeline networks, transboundary transport, and CO_2 stream purity (minimum 96% CO_2 concentration). Notably, it ensures that transport network operators must grant access to third parties unless capacity or connection constraints justify denial. However, provisions for cross-border transport remain limited, relying mainly on cooperation between competent authorities of the involved Member States. Experience from other countries shows that a more detailed framework is needed for CO_2 transport, addressing issues such as network planning, the type of third-party access (regulated vs. negotiated TPA), the financing model for network build-out, permitting procedures, and related regulatory aspects.

At present, Latvia has not yet established all the necessary legal arrangements for exporting CO_2 to offshore storage sites in other countries, such as those in the North Sea. This is a key gap for enabling cross-border CCS projects. Latvia has not ratified the London

Protocol—administered by the International Maritime Organization (IMO) — CCS relevant document that provides the global legal framework for regulating marine CO_2 storage and transboundary CO_2 flows. Article 6 of the Protocol, which originally prohibited CO_2 export for offshore storage, was amended to allow such transfers. However, this amendment has not yet been ratified by a sufficient number of Parties to enter into force. Until then, participating countries must rely on bilateral agreements, which must be notified to the IMO. These arrangements require intergovernmental cooperation and create additional procedural burdens for cross-border CCS deployment. At the same time, the need for London Protocol ratification by Latvia might not be that certain. The European Commission argued that between EU countries, CO_2 flows are already regulated by the EU ETS and CO_2 Storage Directives, except for minor issues. According to the Commission's services analysis paper[x] "The EU ETS and CCS Directives compose the applicable legal framework in place in the European Economic Area (EEA) for the capture, cross-border transport, and safe geological storage of CO_2. This legal framework constitutes a relevant arrangement between Parties under art. 6(2) of the London Protocol, as amended in 2009. Accordingly, any operator of CO_2 transport networks and/or CO_2 storage sites can fully benefit from the EU legal framework to import and/or export captured CO_2 without bilateral agreements. However, parties may use bilateral arrangements to agree on residual issues that are not covered by EU law, such as cooperation between the responsible permitting authorities."

Additionally, in order to enable CO2 storage in the geological sub-seabed structures of the Baltic Sea, the Helsinki Convention must have either interpreted clearly by the HELCOM (the secretariat of the Helsinki Convention) or relevant amendments need to be made.

In conclusion, Latvia is making significant progress in 2025 toward establishing a comprehensive legal framework for the geological storage of CO_2, in line with EU legislation. These efforts lay the foundation for future domestic deployment of CCS technologies. However, to fully unlock the potential of CCS, further legal measures will be necessary, including designating a lead institution for CCS and clear responsibilities at regional and local levels.

1.3. Market conditions

According to the CCS4CEE project analysis, based on official EU ETS data, the energy sector remains the largest source of CO_2 emissions in Latvia, highlighting the need for targeted decarbonisation strategies in this area (Figure 1). Latvia's total CO_2 emissions have decreased by nearly 60% since 1990. However, in recent years, this downward trend has stopped, with no significant emission reductions observed.

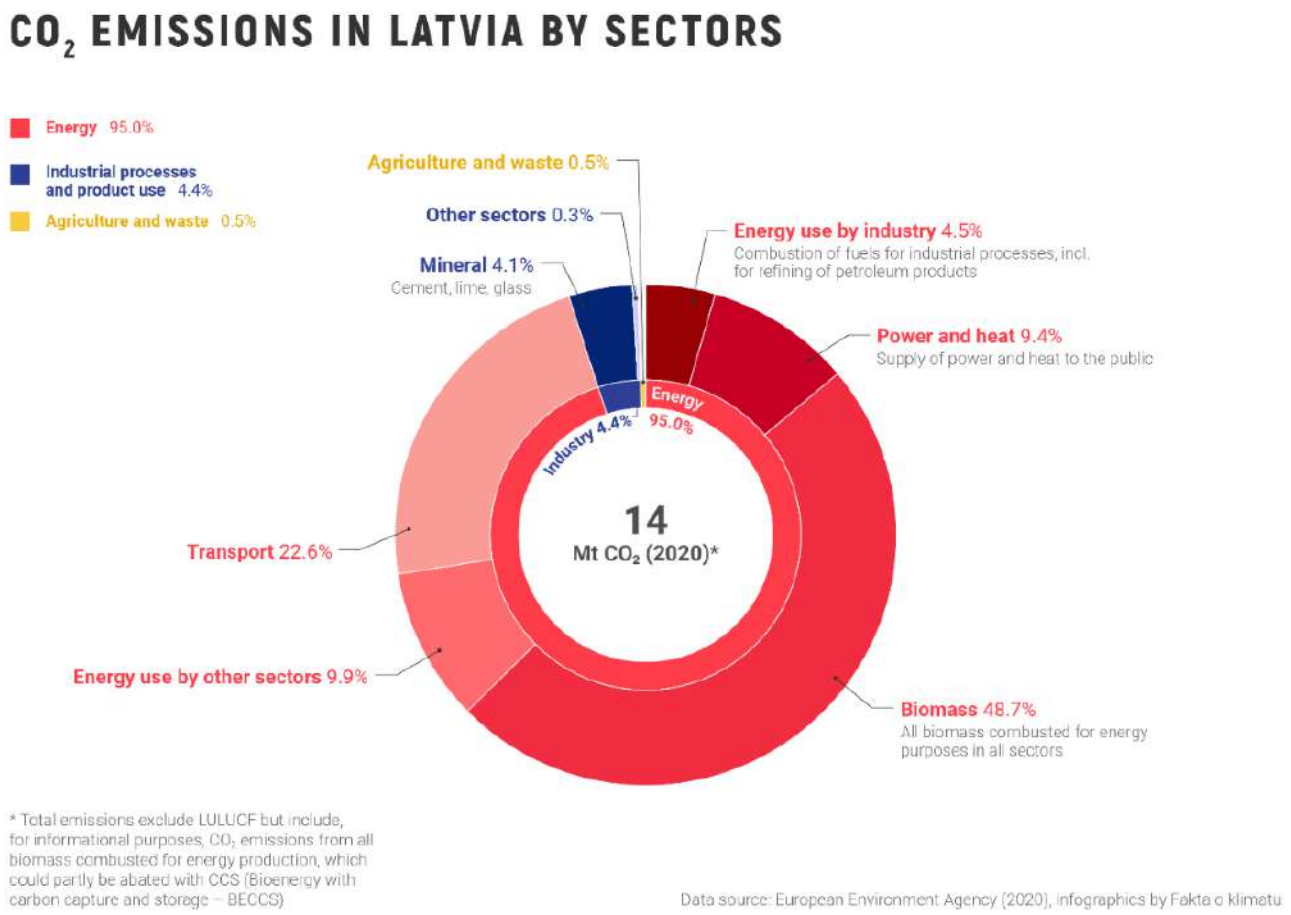


Figure 1. CO_2 emissions in Latvia by sectors.

In Latvia, the two main carbon-intensive industrial sectors are energy production and cement manufacturing. The largest CO_2 emitter in the energy sector is the TEC-2 combined heat and power plant, operated by the state-owned company Latvenergo, which emitted 546.3 kt of CO_2-equivalent in 2023. In the cement sector, all emissions originate from a single private company, Schwenk Latvija, which released 744.1 kt of CO_2-equivalent in 2023[xi].

Together, these two companies account for more than half of Latvia's total industrial CO_2 emissions at the installation level (see Figure 2), underscoring their central role in the country's decarbonisation efforts.

Figure 2. The biggest emitters in Latvia.

In November 2024, cement producer Schwenk Latvia announced a 500-million-euro investment to decarbonise their operations through the deployment of CO_2 capture by 2030[xii]. This marks the first instance of an industrial company in Latvia applying CCS technology. During the announcement, the Minister for Climate and Energy Kaspars Melnis revealed that the ministry is preparing to initiate exploration of CO_2 storage potential in Latvia and is considering regulatory changes to lift the current prohibition on CO_2 storage in the territory of Latvia.

In August 2025 Schwenk Latvia has launched the implementation of a CO_2 capture pilot project at its cement plant. This marks a significant step toward establishing a fully operational value chain by 2030, with the ambition to capture 800,000 tons of CO_2 annually at this site alone, and to replicate the technological approach across the Group's other cement plants.

According to Latvian NECP, no national government funding mechanisms or economic incentives are specifically allocated to CCS deployment in Latvia. The Innovation Fund is mentioned as a potential funding source, along with other public or private funding, though no further details are provided.

Nevertheless, if prioritized by the government, CO_2 storage project in Latvia could also become eligible for support under the Connecting Europe Facility (CEF) funding program if cross-border element would be presented. This assessment is based on a comparable case: the Inčukalns underground gas storage project, which received €44 million in CEF support, covering 50% of the costs for infrastructure modernization[xiii]. Additionally, Schwenk Latvia is also a partner in the Baltic CCS Consortium project, an EU Project of Common Interest. This project aims to transport captured CO_2 from Lithuania and Latvia to permanent storage sites, potentially in the North Sea through Klaipeda port.

In the current context, from the economic perspective, there is no evident business case for CCS in Latvia. The EU ETS price alone, representing the cost of emitting a tonne of CO_2, is lower than the cost of CCS deployment (cost per tonne of CO_2 captured, transported and stored) for Schwenk Latvia and other potential industrial players in Latvia, and therefore in the short-term EU ETS is not a sufficient economic driver for CCS yet. This in turn necessitates additional financial support to close the cost gap in the absence of sufficient willingness by the market to cover the "green premium" associated with low-carbon products.

1.4. Public Perception

Public discourse on CM in Latvia remains limited. To date, most communication has been initiated by Schwenk Latvia, which has actively promoted its decarbonisation efforts and commitment to climate action. The company has shared its CM plans through national media, its corporate website, and public events—most notably, at the Lampa discussion festival in Cēsis on June 21st, 2025.

The CCS4CEE project has also contributed to a gradual improvement in the quality of national conversations around CCS. By encouraging dialogue and collaboration among industry stakeholders, the project has supported the emergence of a more informed and proactive approach to industrial decarbonisation. It has played an important role in fostering a shared understanding of CCS as a viable climate solution in Latvia.

Based on current public-facing activities, general public sentiment toward CM appears cautiously positive. No significant opposition—such as protests or strong public resistance—has been observed so far. However, there is a clear need for more targeted and strategic communication efforts to engage specific stakeholder groups and increase overall awareness. A tailored, timely approach will be essential to improving public understanding and trust.

According to the CCS4CEE project assessment, Latvian stakeholders are "relatively well-informed about CCS technologies and understand their basic principles." However, most relevant actors remain reserved about pursuing CCS, primarily due to concerns over the economic feasibility of implementation, as well as other limiting factors. The main exception

is Schwenk Latvija—and to some extent Latvenergo—which are both well-informed and supportive of national-level CCS development.

2. Stakeholder Mapping

2.1. Identification of Stakeholders

Ensuring the long-term success of CM initiatives requires coordinated engagement across multiple levels of governance—national, regional, local and in close consultation with private sector, civil society and academia. These initiatives present a complex governance challenge that calls for inclusive, transparent, and well-aligned cooperation among public authorities, industry, civil society, and research institutions. Meaningful stakeholder involvement is essential to overcoming institutional, regulatory, and socio-economic barriers. By fostering shared ownership and support, Latvia can effectively use CM technologies as a key pillar of its industrial decarbonisation strategy.

National Authorities

Ministry of Climate and Energy (Klimata un enerģētikas ministrija – KEM)

KEM is one of the most relevant stakeholders as it is the principal body in charge of climate and environmental matters, formulating national strategies, policies, and legal frameworks, as well as enforcing regulations and policies aimed at reducing carbon emissions and mitigating climate change impacts. KEM is also leading policy stakeholder for carbon management in Latvia, drafting relevant regulations and propositions to the Cabinet of Ministers and Latvian Parliament.

Ministry Of Economy (Ekonomikas ministrija - EM)

EM oversees activity of industrial competitiveness, potentially cooperating with KEM on incentivizing CCS initiatives from the nationally available EU funds. EM is the main stakeholder for national industrial competitiveness strategy, where carbon management activities should be elaborated.

Large and Strategically Important Investment Project Council led by the Prime Minister (Investment Council)

The Investment Council managed by the Investment and Development Agency of Latvia and led by the Prime Minister could have an important role through its functions of strategic coordination, speeding up, monitoring, and evaluation of strategic projects. The Investment Council is well-positioned to facilitate collaboration between different public entities, ensuring strategic alignment across different ministries and sectors, with a key role in interinstitutional coordination, thereby developing a unified approach relevant for carbon management. It supports the preparations and implementation of strategic programs, including those that are focused on carbon emissions reduction, for instance.

VSIA "Latvijas Vides, ģeoloģijas un meteoroloģijas centrs"

The Latvian Environment, Geology and Meteorology Centre ensures the collection, accumulation, and provision of environmental information to the public, state and municipal institutions, conducts environmental monitoring, identifies and evaluates subsoil resources, manages the state-owned hazardous waste landfill, ensures the safe management of radioactive waste and nuclear facilities, and also participates in the implementation of national policies in the fields of geology, meteorology, climatology, hydrology, water and air quality, the impact of transboundary air pollution, and the management of radioactive and hazardous waste, maintains the national geology fund, reference and standard specimens, environmental data archive, and scientific and technical literature library. This institution most likely will be relevant stakeholder when regulations on CO_2 storage site development will be presented to the Cabinet of Ministers, as well as for geological assessment and permitting processes.

The State Environmental Service (Valsts Vides Dienests - VVD)

The State Environmental Service purpose is to ensure that the laws and regulations in the field of environmental protection, radiation safety and nuclear safety and the use of natural resources are observed, as well as to promote the sustainable use of natural resources and energy. VVD has the functions to perform State control of environmental protection and utilisation of natural resources in the territory of Latvia, the continental shelf and the economic zone of the Republic of Latvia of the Baltic Sea in accordance with the procedures specified in regulatory enactments regulating environmental protection.

According to Article 10 of the Law on Subterranean Depths, the use of underground resources may only begin if a license issued by the State Environmental Service, or a permit for the extraction of frequently occurring mineral resources issued by the local government, has been obtained in accordance with the procedures established by the Cabinet of Ministers.

"Conexus Baltic Grid" AS (Conexus)

Conexus is the single natural gas transmission and storage operator in Latvia, responsible for the safe operation of the natural gas transmission system and ensuring regional gas flows in the Baltic region, which includes Latvia, Estonia, and Finland. The company operates extensive natural gas transmission and storage facilities, including Inčukalns underground gas storage[xiv], which is the only functional storage in the Baltic countries, which ensures the stability of regional gas supply.

If given decision by the Cabinet of Ministers, Conexus could play significant role for carbon management, becoming the CO_2 storage and transport operator. That would allow Conexus build on their experience with natural gas to support industrial decarbonization – transporting via pipelines and permanently storing CO_2 in geological formations in Latvia.

In that case, Conexus would need to ensure transparent network planning, third party access to pipelines on clear conditions, including cross-border connections.

Liepāja Special Economic Zone (LSEZ)

LSEZ, that includes Liepaja port administration, in 2024 established the Liepaja Sustainable Industry Hub, by combining several private strategically important green energy, smart production and innovation investment-based projects. Among those projects one is them envisions to develop CO_2 import and export terminal for carbon transportation and storage, potentially implemented by the company NORSAF.

Regional Authorities

Saldus

Saldus Municipality is the key region for the Schwenk Latvia CCS project as in its territory where both the cement plant and limestone extraction field are located. Regional authorities' role is not strictly defined in CM value chain, however potential roles could be related with spatial planning (around the carbon storage sites) in the region and environmental assessment procedures, as well as ensuring public awareness of potential carbon management projects.

Dobele

Dobele Municipality could potentially play important role for CO_2 storage from CCS projects as it has the highest storage readiness level (SRL) from Latvian onshore CO_2 storage locations, and it is the closest location to Schwenk Latvia cement plant that has concrete CCS plans and actions.

Local Authorities

Brocēni

Brocēni is a town in Saldus Municipality. Broceni is key location for Schwenk Latvia cement plant CCS project as this is the place where the plant is located and have been successfully operating for decades.

Chambers of Commerce and Labour Unions

Latvian Chamber of Commerce (LTRK), Latvian Labour Confederation (LDDK), and Foreign Investors Council in Latvia (FICIL) activity, due to their roles in supporting local and national economic development, focuses on advocating for business interests. They can be valuable by identifying new business opportunities and tracking emerging enterprises that might offer potential benefits. Their input would focus on ensuring that interests are taking into account in a transparent manner through capacity building initiatives. Additionally, they have the ability organize business

forums, trade fairs, and exhibitions, which can serve as platforms to showcase CCS technologies knowledge and develop economic partnerships in the field of carbon management.

NGOs

Latvijas mazpulki

Latvijas mazpulki as a regional organisation can build understanding and dialogue about carbon management risks and opportunities allowing to demonstrate how CCS and other CM solutions can play a crucial role in decarbonising hard-to-abate sectors and thus support local industries that play vital role in those regions. Therefore, their support and influence could also help reach local communities, bringing greater legitimacy and inclusivity to potential CM projects.

Pasaules Dabas Fonds (WWF)

WWF can serve as a key stakeholder, due to its extensive experience in advocating for sustainable solutions, as well as their experience in educational initiatives. As one of the most relevant environmental organizations, WWF has a deep understanding of the climate crisis and the technological solutions needed to address it, through infrastructural development and ecological economic revitalization. While WWF may have reservations about certain aspects of CCS, their input could help address potential concerns on early stage.

Zaļā brīvība (Green Liberty)

Green Liberty is experienced advocacy organization focused on climate change in Latvia with extensive expertise in areas like ecology and climate policies. They are active in legislation process. In this regard, they could help strengthening CM advocacy efforts, particularly in regions where CCS solutions are most needed.

Greentech Latvia

Greentech Latvia is experienced advocacy and research organization focused on climate and technology projects in Latvia, but having also close links to Estonia, Lithuania and European Networks. This NGO could be instrumental stakeholder for regional awareness rising about CM.

Latvijas Dabas Fonds

Latvian Nature Fund is one of the oldest nature protection organisations in Latvia. They would be a highly valuable stakeholder due to its deep expertise in public policy and environmental governance. They could be helpful in raising public awareness and a better understanding of carbon management technologies, while developing informed participation.

Industry - *Cement & Lime*

Schwenk Latvia

Schwenk Latvia is the key industrial stakeholder as the only clinker and cement producer in Latvia. With a CO_2 capture project under development, Schwenk Latvia also actively push for the needed regulation to enable CCS in Latvia directly and through Foreign Investors Council in Latvia interacting with the relevant ministries and Latvian Parliament.

Industry - *Heat Generation*

Latvenergo

Latvenergo is a state-owned enterprise that plays significant role in energy supply and in energy generation transition from fossil fuels to renewables (hydro, solar and wind). Their largest generation unit, TEC2, is the biggest CO_2 emitter in Latvia.

Industry – *CO_2 terminal developer*

NORSAF

NORSAF is a private company in Liepaja with ambition to implement the project for construction of a sustainable aviation fuel (SAF) production plant and CO_2 terminal in the Liepaja Special Economic Zone. NORSAF envisions that produced green wind and solar electricity will be used in the electrolysis process to produce green hydrogen, which will then be used as a raw material, together with the captured CO_2, in the production of SAF and eSAF.

Academia/ Research Institutes

University of Latvia (LU)

In 2022 researchers from University of Latvia Environmental science faculty led by prof. Māris Kļaviņš did research about potential CO_2 storage in Latvia to reduce CO_2 emissions into atmosphere from large stationary emitters. They have several publications on CM topic that can be used for local knowledge sharing events[xv].

Riga Technical University (RTU)

RTU could be a relevant consultative stakeholder due to its expertise in large-scale, interdisciplinary research in topics related to CO_2 transport, storage and environmental assessment. Their role in evaluating geological and marine environments, developing integrated geo-spatial models and contributing to international CCS research equips them to provide input on the environmental, geological and infrastructural feasibility of proposed solutions. Their experience also positions them to contribute to transparent stakeholder engagement, environmental monitoring strategies and science-policy integration throughout the project evolution.

2.2. Role Clarification

As shown in Table 1, currently the only industrial stakeholder that has publicly expressed clear strategy and commitment to deploy carbon capture technology is Schwenk Latvia. For cement (hard-to-abate) sector rising ETS costs, competitiveness losses, and potential downsizing without access to CCS, underscores the urgent need for clear policies and fair transition measures to protect local jobs and regional economies with many other national competitiveness implications.

While AS "Conexus Baltic Grid" at this moment have not been legally designated as CO_2 transport and storage operator in Latvia, their expertise in natural gas transmission and geological storage positions them as likely candidates to develop and operate future CO_2 transport and storage infrastructure. However, this is early estimate with one of the options, as responsible ministries and the Cabinet of Ministers may develop regulations with different strategy.

Table 1: Industrial Stakeholders

Category	Companies	Notes
CO_2 Emitters	**Cement and Lime**: Schwenk Latvia	Hard-to-abate industrial emitter & potential candidate for CO_2 capture technologies. Other emitters might join when the technology and infrastructure in Latvia matures
Transport Operators	Connexus Baltic Grid	Potential developer and operator of CO_2 pipeline infrastructure, based on existing natural gas experience
CO_2 Users	Linde Gas, e-fuel producers, e.g. NORSAF, greenhouse operators and food industry	Relevant to the CO_2 utilisation component of the CCU/CCUS chain
Storage Operators	Connexus Baltic Grid	CO_2 storage operator based on existing natural gas experience

Alongside industrial players, various public institutions, associations, NGO's and academia listed in Table 2, play a substantial role in representing the collective interests within the sector.

Table 2: Stakeholders Engagement

Stakeholder Group	Engagement Level	Description / Notes
Local and Regional Authorities		

City Halls, Local and County Councils, Regional Development Agencies, Regional Chambers of Commerce	**Low**	Currently under-engaged in their operations, as regulatory frameworks remain unclear. However, there is potential to influence strategic planning and regional economic development, and CM has the capacity to support regional and local socio-economic development if integrated into policy and planning.
National Authorities		
Ministry of Climate and Energy (KEM)	**Moderate**	CM aligns with their mandate but has not yet become a central policy priority for proactive policy development.
Ministry of Economy and subordinated Investment and Development Agency of Latvia	**Moderate**	Institutional ambition exists, but enforcement, dedicated capacity building, and proactive leadership in CM remain limited. Governance and funding fragmentation across ministries adds uncertainty and slows coordinated decision-making
The Prime Minister	**Moderate**	Coordinates the Large and Strategically Important Investment Coordination Council, serving as a central convening body. However, lacks formal enforcement mechanisms and has limited administrative capacity to ensure follow-through on commitments and interinstitutional coordination.
Other Regulatory Authorities: VSIA "Latvijas Vides, ģeoloģijas un meteoroloģijas centrs", State Environmental Service	**Low to Moderate**	Their roles in CM are not yet clearly defined or prioritized within internal institutional regulations and the delegated Cabinet Regulations. Limited capacity and unclear coordination mechanisms hinder their proactive engagement in CM development. Will be responsible for CO_2 storage licensing process, regulatory enforcement and environmental compliance
Industrial Stakeholders		
Industry	**Moderate to High**	Includes major emitter (cement producer Schwenk Latvia), potential investors in CO_2 capture infrastructure and transport & storage operators.

		Directly impacted by CM policies, emissions regulations, and carbon pricing mechanisms. Engagement varies by sector and company, depending on: • Perceived regulatory clarity • Access to funding and incentives • Relevance and feasibility of CM technologies for the sector's core activities
Business & Industry Associations	**Moderate**	Represent key industrial stakeholders and have the capacity to: • Shape public discourse around CM • Influence policy and regulation through advocacy, lobbying, and consultation processes • Engagement in CM varies but is increasing in highlighting industry needs and risks. Opportunity to play a stronger role in aligning business interests with national CM strategy and ensuring smoother policy implementation.
Civil Society		
Academia and Research Institutes	**Moderate**	Contribute technical expertise and scientific analysis on CCS but with little policy uptake and interest Participate in some research consortia and technical assessments Lack formal institutional authority in CM governance or decision-making processes. Opportunity to strengthen impact through closer collaboration with public institutions and industry on CM project development and implementation. RTU and University of Latvia universities have strong potential for applied CM research and development of well-educated labor
Environmental NGOs	**Low**	Often actively advocate for environmental protection and ecosystem safeguards without full information on CM actual implications. Opportunity to expand their role through structured engagement in CM governance,

		especially around transparency and sharing of relevant information, studies and projects.

Particular attention should be paid to the national authorities, as well as other institutions with regulatory, compliance, and reporting functions. Understanding their legal mandates, and institutional capacity is crucial to design a robust carbon management framework. According to Article 10 of the Law on Subterranean Depths, the use of underground resources may only begin if a license issued by the State Environmental Service or a permit for the extraction of frequently occurring mineral resources issued by the local government, has been obtained in accordance with the procedures established by the Cabinet of Ministers.

Table 3: Summary of Functional Differentiation

Level	Main Function in CM Initiatives
Local	• Limited formal legal role in CM planning, permitting, or oversight. • Potentially could be more actively involved in CM discussions or project development. • Limited awareness and capacity on CM topics.
Regional	• No clearly defined mandate in CM strategy or infrastructure coordination. • Not actively involved in shaping regional approaches to CM. • Limited coordination with national authorities on CM topics.
National	• Holds legal and regulatory responsibilities for CM (e.g., licensing, funding access, EU alignment). • Leads strategic planning, inter-ministerial coordination, and compliance with EU legislation (NZIA, Directive 2009/31/EC).

3. Resource Availability

3.1. Financial, Human and Knowledge Resources

According to Latvia's NECP, no national government funding is currently allocated for the deployment of CM technologies. While the Innovation Fund is cited as a potential financial source—along with other public and private funding instruments—no specific mechanisms or commitments are outlined. More information on potential funding sources for CM projects described in section 1.3. of this report.

Stakeholders in Latvia demonstrate varying levels of capacity and expertise related to CM implementation. Schwenk Latvia and, to some extent, Latvenergo stands out with dedicated personnel who leads, develops and oversight potential CM project development, even shaping the legal framework and raising public awareness, as well as participating in the annual Baltic Carbon Forum and other events and study tours related to CM matters.

By contrast, other key actors—such as relevant ministries, local authorities, and civil society organizations—would benefit from targeted information-sharing, capacity-building initiatives, and dedicated workshops to strengthen their understanding of carbon management and their role in its implementation.

A significant knowledge resource in the region is the annual Baltic Carbon Forum, organised by BASRECCS, which offers a comprehensive programme focused on the carbon management policy, project, and research landscape.

In Latvia, an increasing number of researchers are exploring carbon management topics, particularly within the Riga Technical University's Institute of Energy Systems and Environment, where several PhD programmes address these thematic areas.

3.2. Technical Resources

At present, Latvia lacks CO_2 transport infrastructure at a scale suitable for CM projects. There are no publicly available national studies or assessments exploring the potential to build dedicated CO_2 pipelines or to retrofit existing natural gas infrastructure for CO_2 transport purposes in Latvia.

The PCI-listed Baltic CCS Consortium includes the development of transport infrastructure connecting emitters in Lithuania and Latvia (including Schwenk Latvia) to the Port of Klaipėda. However, the specific mode of transportation has not yet been clarified, as there are currently no existing pipelines or railway links connecting these locations.

In terms of storage capacity, Latvia's subsurface geology contains numerous porous formations that could serve as sites for permanent CO_2 storage. However, these formations have not yet undergone the necessary exploration, testing, or development required to confirm their suitability. In early research done already in 2013 researchers identified and illustrated 17 potential CO_2 storage structures across Latvia (Figure 3)[xvi]. Later, these data were slightly updated resulting in, 16 structures located onshore within Latvian territory, while one (E6) studied in details structure situated offshore in the Baltic Sea. These initial findings indicate a promising geological basis for future CCS deployment, pending further exploration and regulatory development. After 2013, in all major research projects these 17 structures were reported in Latvia (CGS Europe, ESTMAP, CCUS ZEN), noting that these geological structures could potentially store CO_2 in a manner similar to the operation of the Inčukalns underground natural gas storage facility, which has been in use for several

decades. Additionally, there are numbers of prospective structures available offshore in Latvia, but their storage capacity is not yet estimated (Sliaupa et al, 2013).

Figure 3. Potential CO_2 storage locations in Latvia.

Similar data is presented in materials from the Horizon Europe–funded CCUS ZEN project[xvii], including a map (Figure 4) highlighting two major CO_2 emission sources in Latvia: the Schwenk Latvia cement plant in Brocēni and the Latvenergo TEC-2 combined heat and power plant near Riga. The deliverable also identifies potential CO_2 storage sites mostly consistent with those geological assessments referenced by the research compiled by the University of Latvia.

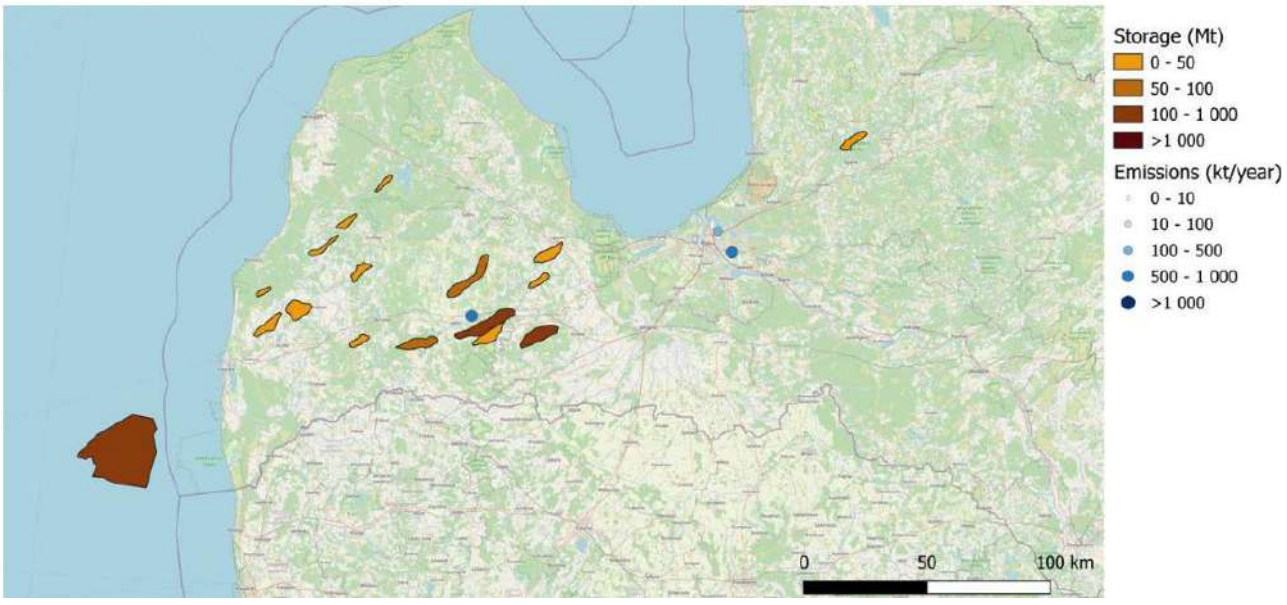


Figure 4. Potential CO_2 storage sites and emission sources in Latvia.

The CCUS ZEN project also provides an additional mapping layer indicating Natura 2000 protected areas, which must be taken into account when evaluating potential sites for CO_2 storage deployment to ensure environmental compliance and minimize ecological impact.

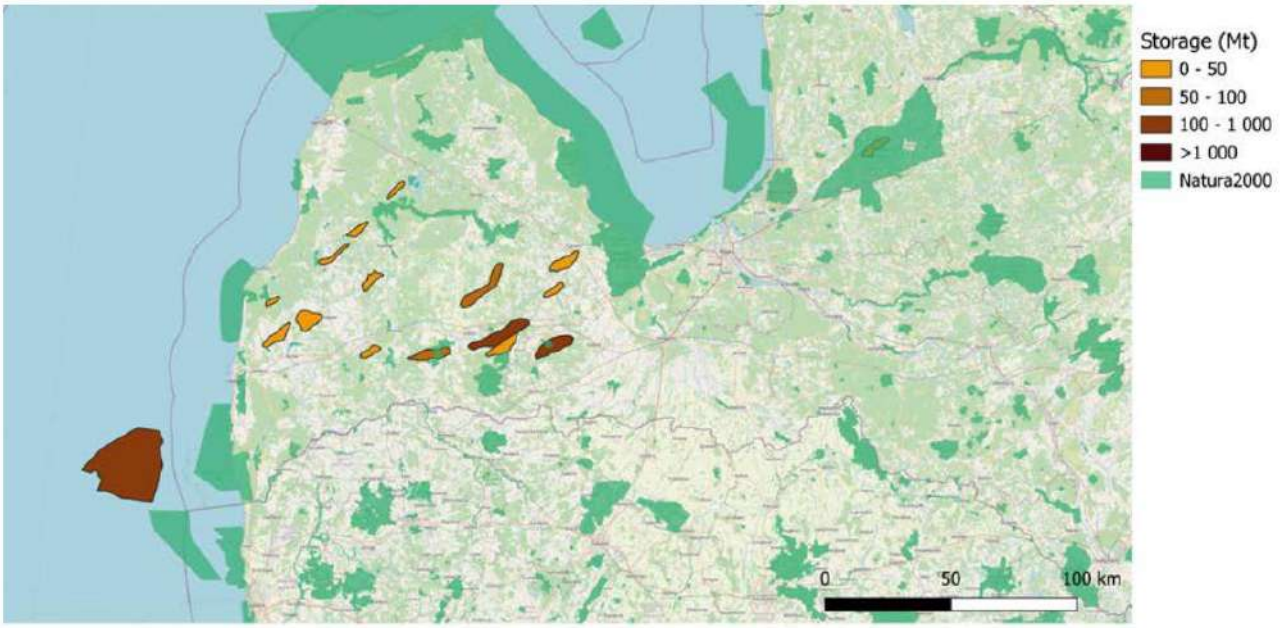


Figure 5. Potential CO_2 storage sites in Latvia and Natura 2000 areas.

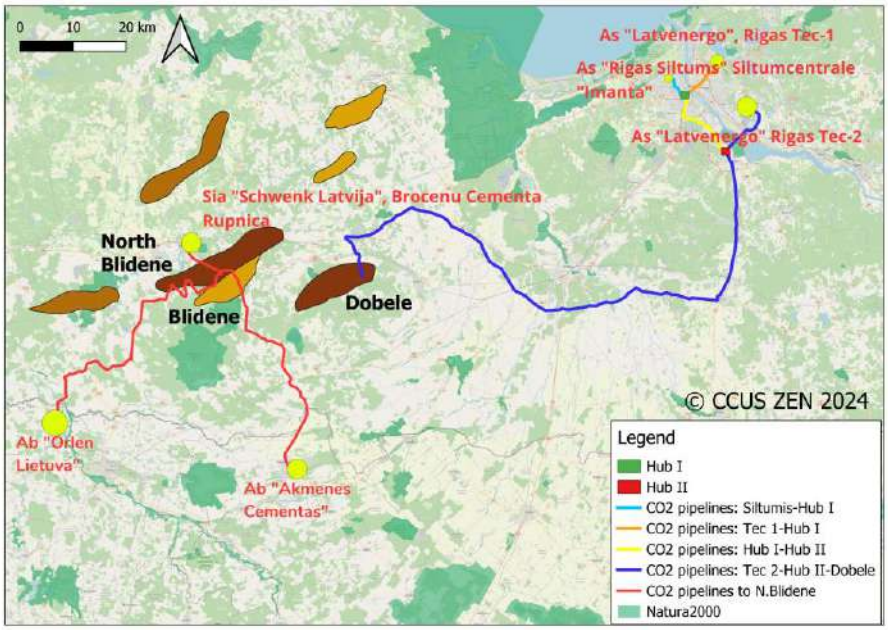


Figure 6. Map with modelled pipelines routes to the CO_2 storage sites in Latvia

Figure 6. Map of the Baltic-1 scenario with pipeline routes modelled along natural gas pipeline corridors. Latvian Riga cluster of three power plants will transport CO2 to the Dobele structure. Cement plants from Latvia, Lithuania and Orlen Lithuania will transport CO2 to the North Blidene structure in Latvia. The Blidene structure is proposed for H2 storage[xviii].

The authors of the CCUS ZEN project also assessed and ranked potential CO_2 storage sites based on their estimated storage capacity, from highest to lowest. In addition, they applied a Storage Readiness Level (SRL) framework to indicate the maturity of each site. SRL is a structured tool used to evaluate and communicate the progress of technical appraisal, permitting, and planning activities at a potential CO_2 storage site, as well as to identify the remaining steps required before operational deployment[xix].

The North Blidene and Dobele structures, the largest prospective for CO2 storage onshore structures located in the western Latvia, were chosen for the Baltic onshore CCUS scenario in CCUS ZEN projects and before (Shogenova et al, 2021, 2023). Their storage capacity was estimated earlier as 74 Mt and 56 Mt CO2 [Shogenova et al, 2009]. In the latest research the average optimistic storage capacity was estimated as 267 and 106 Mt CO2[xx] (Simmer, 2018, Shogenova et al, 2021).

The highest top point of the North Blidene storage site, ranked at SRL level 3, is located approximately 10 kilometers from the Schwenk Latvia cement plant. Latvenergo TEC-2 plant located 130 km from Dobele storage site ranked at relatively high SRL 4. If regulatory and permitting processes are implemented in a timely manner, North Blidene and Dobele could serve as a financially viable storage location for the national and regional decarbonisation plans.

Storage name	Storage type	On-shore / off-shore	Unit type	SRL level	Capacity [Mt]	Ref.
E6	Deep Saline Aquifer	Offshore	Daughter Unit	4	396	6
North Blidene	Deep Saline Aquifer	Onshore	Daughter Unit	3	267	8
Dobele	Deep Saline Aquifer	Onshore	Daughter Unit	4	106	5
South Kandava	Deep Saline Aquifer	Onshore	Daughter Unit	3	95	5
Luku-Duku	Deep Saline Aquifer	Onshore	Daughter Unit	2	68	4
Liepaja	Deep Saline Aquifer	Onshore	Daughter Unit	2	37	4
Blidene	Deep Saline Aquifer	Onshore	Daughter Unit	3	30	8
Snepele	Deep Saline Aquifer	Onshore	Daughter Unit	2	29	4
North Ligatne	Deep Saline Aquifer	Onshore	Daughter Unit	2	23	7
Degole	Deep Saline Aquifer	Onshore	Daughter Unit	2	21	4
Kalvene	Deep Saline Aquifer	Onshore	Daughter Unit	2	20	4
Viesatu	Deep Saline Aquifer	Onshore	Daughter Unit	2	20	4
Aizpute	Deep Saline Aquifer	Onshore	Daughter Unit	2	18	4
North Kuldiga	Deep Saline Aquifer	Onshore	Daughter Unit	2	14	4
Edole	Deep Saline Aquifer	Onshore	Daughter Unit	2	11	4
Vergale	Deep Saline Aquifer	Onshore	Daughter Unit	2	9	4
Usma	Deep Saline Aquifer	Onshore	Daughter Unit	2	8	4
Sum CCUS ZEN storage capacity in Latvia					**1 172 Mt**	

Table 4. Possible CO_2 storage sites in Latvia identified by CCUS ZEN

AS "Conexus Baltic Grid", as the sole operator of Latvia's natural gas transmission and storage system - including the Inčukalns underground gas storage, the largest facility of its kind in the Baltic region – may possess the technical expertise and operational capacity needed to support the development of CO_2 storage infrastructure[xxi].

4. Analysis

4.1. Evaluation of Objectives

	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 Framework	*Status of implementation of legislation and regulation governing CM and CCS*			
Market Conditions/ financial support	*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, Human and Knowledge Resources	*Availability of financial resources for CM/CCS projects*			
	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			

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

4.2. Strategic Alignment

Recent advancements in renewable energy projects in Latvia enable decrease of GHG emissions but are not sufficient to reach deep decarbonisation consistent with the Paris Agreement, as recognised by International Energy Agency in its technology assessments and various modelling studies by both European Union institutions and independent researchers. CM deployment may provide a necessary solution to reduce large volumes of industrial emissions in Latvia, e.g. from the cement production process, and potentially provide low-carbon industrial heat and waste incineration processes. However, CM implementation requires a comprehensive set of activities to ensure more awareness and information availability about CM potentials in Latvia, ensure necessary capacities to main stakeholders, develop policy framework and effective coordination for long-term infrastructure development.

4.3. Regulatory and Compliance Assessment

Regulating CM requires consideration of the full value chain. In order to enable CM deployment in Latvia in foreseeable future, Latvian government should ensure the following activities related to the regulatory framework:

- Finalise national carbon management regulations, including provisions for safe CO_2 storage in line with the CO_2 Storage Directive. The lifting of the CO_2 storage ban in Latvia's Law on Pollution marks a very important step forward; however, the next priority is to develop all related Cabinet Regulations mandated by the newly adopted Law on Subterranean Depths, including on transparent and effective liability regulations for leakage risks for CO_2 transport and long-term storage facilities, as well as non-discriminatory third party access to CO_2 infrastructure.
- Ratify the London Protocol and consider international and/or bilateral agreements for the transport of CO_2 across borders.
- Support activities of the HELCOM CCS working groups by taking positive decisions during discussions towards permitting CO2 storage under the Baltic Sea seabed

4.4. Geographical impact mapping

The primary geographical areas in Latvia where CM projects are expected to have the greatest impact - based on industrial activity, existing infrastructure, and geological storage potential - are the Brocēni and Dobele municipalities. Brocēni is the site of Schwenk Latvia's cement production facility, which is preparing to

deploy CO_2 capture technology. North Blidene located nearby, contains the most promising geological formation for permanent CO_2 storage. The close proximity and strategic alignment between the emissions source in Brocēni and the storage potential in North Blidene position this regional corridor as a key focus area for the development and deployment of effective carbon management solutions in Latvia.

Additionally, Liepaja as a port city can play an instrumental role as a potential key logistical point for CO_2 handling, either for import or export of CO_2 for permanent storage.

Latvian government should facilitate the following activities related to the CO_2 storage in geological formations:

- Accelerate the assessment of geological CO_2 storage potential through new drilling, core sampling, and comprehensive geological research.
- Develop CO_2 transportation regulations as described in Section 1.2. of this report.

Table 5: Primary geological areas in Latvia where CM projects are expected

	Broceni	Dobele	Saldus
CM/CCS industries (e.g. cement industry, waste incineration, chemical industry)	Cement industry		Cement industry
Local demand (e.g. hydrogen production)			
Storage capacity		Storage capacity	Storage capacity (North Blidene)
Availability of infrastructure		No information	Old wells
Stakeholder interest (e.g. project developers, industry)	Schwenk Latvia	Schwenk Latvia	Schwenk Latvia
Public perception	No information	No information	No information

5. Transfer of Findings

5.1. Transfer Findings to project chain

Latvia is currently in the **planning phase** of CM deployment. To move forward effectively, several critical actions must be taken to address existing gaps:

1) Geological Exploration

Comprehensive geological surveys and exploration are required to improve understanding of subsurface formations suitable for CO_2 storage. These activities are crucial to assess the technical feasibility and capacity of potential storage sites, as well as to support the planning of CO_2 transport infrastructure. The Latvian government should clearly define leadership in this process — whether it will be carried out by a designated state institution or facilitated in a way that allows private companies to apply for exploration licenses.

2) Development of CO_2 Transport Infrastructure

At present, Latvia lacks CO_2 transport infrastructure at a scale suitable for CCS. To address this, Latvian government should develop a national infrastructure and logistics plan that:

- Aligns infrastructure development with national climate targets;
- Involves close consultation with municipalities, the private sector, and civil society stakeholders;
- Considers various transport modes—including pipelines, ships, trains, and trucks;
- Enables future expansion to connect with inland industrial clusters and cross-border networks;
- Is underpinned by a transparent regulatory framework to ensure open access, avoid monopolies, and support potential use for carbon dioxide removal (CDR) to achieve negative emissions.

Further technical studies are needed to assess multiple CO_2 transportation scenarios, including both onshore and offshore routes.

3) Capacity Building

Strengthening the institutional and technical capacity of key public sector stakeholders and civil society organizations is essential. Targeted training, knowledge exchange, and stakeholder engagement initiatives will ensure informed and inclusive decision making throughout the deployment process. Latvian authorities should use more internation knowledge sharing platforms and forums (e.g. Baltic Carbon Forum, Zero Emissions Platform) to strengthen capacity and explore new opportunities for CM in Latvia.

4) Completion of the Legal and Regulatory Framework

Latvia must finalise and operationalise clear, comprehensive regulations on CO_2 transportation and geological storage, fully aligned with the EU CO_2 Storage Directive. Additional legal steps include:

Consideration of bilateral agreements to facilitate international CO_2 transport and storage;

- Advocacy for amendments to the Helsinki Convention, allowing CO_2 storage in geological sub-seabed formations in the Baltic Sea;
- Development of clear liability regulations addressing potential leakage risks and long-term responsibilities for storage sites.

Mitigation measures: Strengthening institutional capacity is essential. Latvia should also establish a national CCS roadmap, providing a strategic anchor for policy, investment, and implementation.

Public engagement is important to ensure local communities have sufficient information without delayed engagement. National or regional CCS awareness raising campaigns would be helpful.

Mitigation measures: Latvian authorities (e.g. KEM in cooperation with key stakeholders through dedicated working group) must develop and implement a comprehensive public communication strategy, with transparency and community participation at its core. Early integration of public engagement into permitting and consultation processes is essential to building trust and avoiding future opposition.

Construction phase

In order to develop CCS infrastructure in Latvia, new Cabinet regulations are expected, and new procedures remain untested. Further implementing norms and interinstitutional coordination are still needed to make the permitting process fully functional and predictable for CCS project developers. To date, no permits for CCS projects have been granted, and important questions remain about access to infrastructure and the clarity of licensing pathways.

Mitigation measures: The government must prioritize the finalization of secondary legislation on CO_2 storage and transport, including tariff structures, access rules, and licensing. Testing the permitting process through pilot projects will help identify gaps and streamline future project timelines.

Operation phase

The long-term viability of CCS in Latvia is undermined by a lack of a national funding mechanism and persistent market uncertainties with lacking business models that ensure cost recovery and long-term liability coverage.

Mitigation Measures: The government should develop co-financing instruments, introduce de-risking tools, and provide regulatory clarity regarding post-closure responsibilities and liability management. This will increase investor confidence and create a more stable financial environment for CCS projects.

Monitoring phase

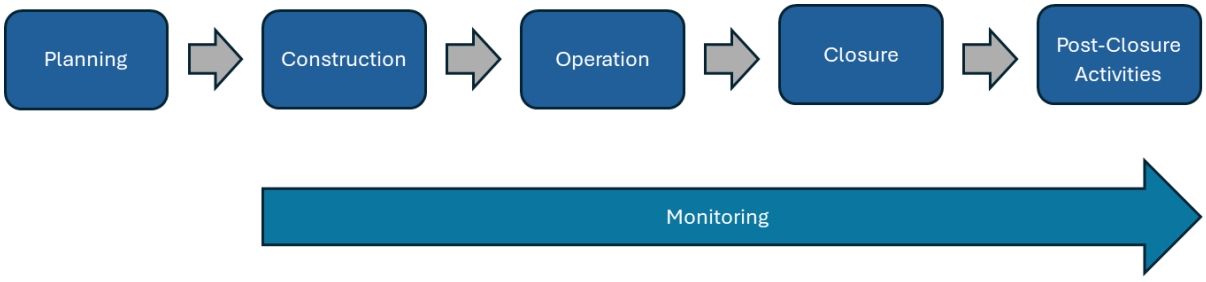
Although Latvia's CO_2 storage potential is promising, it remains theoretical estimation, as it is based primarily on modelling rather than validated through pilot testing or in-situ analysis, therefore technical uncertainties remain. Furthermore, the country lacks any operational CCS facilities, limiting its ability to develop monitoring protocols or build regulatory confidence.

Mitigation Measures: Latvian government should fund geological pilot projects to validate storage formations and test monitoring technologies. In parallel, building national monitoring capacity and accessing EU funding mechanisms, such as the Innovation Fund will be vital for derisking and knowledge development.

Closure phase

Latvia currently lacks clear regulatory procedures to govern the closure and post-closure stages of CO_2 storage sites. There are no detailed national norms addressing long-term monitoring obligations, site stewardship, or the transfer of liability from operators to the state. This regulatory ambiguity may discourage investment, as project developers remain exposed to indefinite risks and financial uncertainty.

Mitigation Measures: Latvia should develop a post-closure regulatory framework aligned with the best EU practices. This includes setting clear conditions for site closure, defining timelines and responsibilities for post-closure monitoring, to ensure that environmental and public safety obligations are met after injection operations end.



6. Conclusions

This study has identified a series of institutional and regulatory gaps and barriers that hinder the implementation of carbon management in Latvia. Nevertheless, recent progress with Latvian legislation development and industrial readiness and testing carbon capture provides pathway for CCS full value chain deployment.

However, at its core, the main obstacle appears to be the limited administrative capacity and political understanding of what carbon management truly entails. Once political decision-makers better understand the need for carbon management and the benefits CCS can bring, both in terms of regional development and local opportunities, it will be easier to build dedicated support, secure public funding that reflect the specific role of this key decarbonisation solution, particularly for hard-to-abate industries.

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

Written as part of the GreenHorizon CEE Project:
Industrial Carbon Management for a Sustainable Future in CEE

Supported by:

Federal Ministry
for the Environment, Climate Action,
Nature Conservation and Nuclear Safety

European
Climate Initiative
EUKI

on the basis of a decision
by the German Bundestag

Implemented by:

EPG

CSD
CENTER FOR
THE STUDY OF
DEMOCRACY

BELLONA
EUROPA

WiseEuropa

Expert Partner
Fraunhofer

7. Bibliography

[i] European Commission, 2025, Latvia - Final updated NECP 2021-2030 (submitted in 2024) - European Commission

[i] European Commission, 2025, https://commission.europa.eu/energy-climate-change-environment/implementation-eu-countries/energy-and-climate-governance-and-reporting/national-energy-and-climate-plans_en

[ii] Carbon price dashboard, 2025, https://carboncredits.com/carbon-prices-today/ (accessed 17 October 2025)

[iii] Abnamro, 2025, https://www.abnamro.com/research/en/our-research/esg-economist-scenarios-shaping-eu-ets-prices

[iv] EUR-Lex, 2025, https://eur-lex.europa.eu/eli/dir/2009/31/oj/eng#:~:text=Directive%202009%2F31%2FEC%20of%20the%20European%20Parliament%20and%20of,Regulation%20%28EC%29%20No%201013%2F2006%20%28Text%20with%20EEA%20relevance%29

[v] European Commission, 2025, https://commission.europa.eu/topics/eu-competitiveness/clean-industrial-deal_en

[vi] European Commission, 2025, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan/net-zero-industry-act_en

[vii] Bellona Europa, 2025, https://eu.bellona.org/2025/10/09/latvian-parliament-lifts-ban-on-co%e2%82%82-storage-in-geological-formations/#:~:text=On%20October%209th%2C%202025%2C%20the%20Latvian%20Parliament%20approved,ban%20on%20permanent%20CO%E2%82%82%20storage%20in%20geological%20formations.

[viii] Implementation of the EU CCS Directive in Europe: results and development in 2013, A.Shogenova et alia, sciencedirect.com

[ix] BASRECSS, 2025, https://www.baltic-carbon-forum.com/Docu_Signed_Joint_Statment-merged.pdf

[x] European Commission, 2025, EU-London_Protocol_Analysis_paper_final0930.pdf

[xi] European Commission, 2024, https://ec.europa.eu/clima/ets/allocationComplianceMgt.do

[xii] db.lv, 2025, https://www.db.lv/zinas/schwenk-latvija-investes-teju-500-miljonus-eiro-cementa-razosanas-dekarbonizacija-brocenos-518872

[xiii] Connexus Baltic Grid, 2025, https://www.conexus.lv/zinas-presei/ek-prezentes-incukalna-kratuves-modernizacijas-projektu-visas-eiropas-energetikas-drosibas-stiprinasanai

[xiv] Incukalns Underground Gas Storage, 2025, Information about the storage | Conexus

[xv] Underground structures for carbon dioxide storage in Latvia by Jānis Krūmiņš, 2021 https://ccsw.lu.lv/index.php/2021/05/26/339/#:~:text=%C5%85emot%20v%C4%93r%C4%81%20da%C5%BE%C4%81do%20strukt%C5%ABru%20izm%C4%93rus%20un%20tilpumu%2C%20CO,sauszemes%20teritorij%C4%81%2C%20bet%20divas%20strukt%C5%ABras%20ir%20Baltijas%20J%C5%ABr%C4%81

[xvi] Shogenov, K., Shogenova, A. and Vizika-Kavvadias, O., 2013a, Potential structures for CO2 geological storage in the Baltic Sea: case study offshore Latvia, Bulletin of the Geological Society of Finland, 85(1), ISSN: 0367-5211, 65–81.

Shogenov, K., Shogenova, A., Vizika-Kavvadias, O., 2013b, Petrophysical properties and capacity of prospective for CO2 geological storage Baltic offshore and onshore structures, In: Energy Procedia, (5036−5045), Elsevier, DOI: 10.1016/j.egypro.2013.06.417

[xvii] ETIS, 2025, https://www.etis.ee/Portal/Publications/Display/cc77fc95-2140-4761-b5d7-4be4f993ad06

[xviii] Shogenov, K.; Shogenova, A.; Gravaud, I.; Costa S., Leandro H.; Wojcicki, A.; Lothe, A. E.; Silva, E.; Sinayuc, C.; Yıldırım, B.; Bülbül, S.; Schmitt, F.; Ombudstvedt, I.; Østgaard, L.; Frykman, P.; Bouvier, L.; Honegger, M. (2025). A Framework for Selection of Promising CCUS Value Chains in the Baltic and Mediterranean Regions: CCUS ZEN Project Study. *17th Greenhouse Gas Control Technologies Conference (GHGT-17) 20-24 October 2024.* IEAGHG, 1−12. DOI: **10.2139/ssrn.5061466**.

[xix] Science Direct, 2021, https://www.sciencedirect.com/science/article/abs/pii/S1750583621001547

[xx] Shogenova, A.; Sliaupa, S.; Vaher, R.; Shogenov, K.; Pomeranceva, R. (2009). The Baltic Basin: structure, properties of reservoir rocks and capacity for geological storage of CO2. Estonian Journal of Earth Sciences, 58 (4), 259−267. DOI: **10.3176/earth.2009.4.04**.

Simmer K, Estonian-Latvian Transboundary Carbon Dioxide Capture, Transport and Storage (CCS) Scenario for the Cement Industry. Master Thesis. Tallinn University of Technology; 2018:1-48.

Shogenova, A.; Shogenov, K.; Uibu, M.; Kuusik, R.; Simmer, K.; Canonico, F. (2021). Techno-economic modelling of the Baltic CCUS onshore scenario for the cement industry supported by CLEANKER project. *15th International Conference on Greenhouse Gas Control Technologies, GHGT-15,15-18 March 2021, Abu Dhabi, UAE.* Elsevier, SSRN, 1−13. DOI: **10.2139/ssrn.3817710**.
Šliaupa, S.; Lojka, R.; Tasáryová, Z.; Kolejka, V., Hladík, V.; Kotulová, J., Kucharič, L.; Fejdi, V.; Wojcicki, A.; Tarkowski, R.; Uliasz-Misiak, B.; Šliaupienė, R.; Nulle, I.; Pomeranceva, R.; Ivanova, O.; Shogenova, A.; Shogenov, K. (2013). CO2 Storage Potential Of Sedimentary Basins of Slovakia, The Czech Republic, Poland, And Baltic States. Geological Quarterly, 57 (2), 219−232. DOI: **10.7306/gq.1088**.
[xxi] Conexus, 2025, https://www.conexus.lv/information-about-storage