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Legal Framework Analysis for CO_2 Utilisation in Latvia

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***Abstract* – The ever-increasing amount of greenhouse gas emissions are forcing countries and the industrial sector in particular to develop ways to improve the manufacturing industry and reduce the amount of emissions created in compliance with the requirements of the European Green Deal initiative. However, all modifications must be under local laws and European directives. The purpose of this work is to analyse existing laws, regulations, and directives, both local and European, to identify limiting factors and factors that contribute to a more active introduction of systems for capturing, using, and reducing the amount of carbon dioxide created in production processes. The results of this analysis will determine the strengths and weaknesses of the local manufacturing sector and its ability to meet ever-tightening requirements.**

***Keywords* – CO_2; CCS; CCU; policy; legislation**

1. INTRODUCTION

1.1. CO_2 Utilisation / Valorisation Concept

In times of fighting climate change and increasing CO_2 emissions, every possible means must be used to achieve the goal of reducing emissions by 55 % by 2030 and zero emissions by 2050. Switching to a Circular economy can undoubtedly help accomplish these goals. Use of carbon captured from waste streams as a substitute for fossil carbon. Circular economy and sustainable manufacturing sectors can use this solution and thus promote carbon capture and use (CCU) technologies in producing high-value-added goods (e.g., synthetic fuels).

According to the European Parliament and the Council [1], it is necessary to expand the scope of technologies to capture and subsequently store carbon dioxide (either in special storage facilities or in ecosystems).

The European Union actively supports the development and launch of CCU (Carbon Capture and Utilisation) and CCS technologies. Horizon Europe has also been actively calling for integrating carbon capture and/or use systems (CCUS) into industrial centres. This would help significantly reduce the number of carbon emissions created and, in the long term, reduce the cost of CO_2 capture. In the future, the captured carbon dioxide could be used to produce carbon-negative biofuels [2].

The concept of capturing and using carbon dioxide is to capture it during the production of some product (in which CO_2 is a by-product) and return it to the output of some other product as a necessary resource. Such valuable new products can be, for example, chemicals [3] and aviation fuel [4].

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Carbon dioxide utilisation aims to turn waste into a valuable product. And although CO_2 can be converted into valuable products, these conversions are usually very energy-intensive, making it difficult to achieve the desired result in reducing the number of emissions created. To determine the possibility of capturing carbon dioxide, it is necessary to analyse the existing legislation of both the European Union and Latvia.

1.2. CO_2 Utilisation in Products – CCS / CCU Technologies

Innovative installations for capturing and using carbon dioxide are actively discussed at the national and European levels and global levels. When talking about such technologies, the European Commission group asks two critical questions:

- How do we make CCS and CCSU plants efficient but, at the same time, environmentally friendly enough? What are the actual climate benefits of these technologies?
- How to consider climate mitigation of carbon dioxide in complex products – chemical compounds, fuels, etc. Since carbon dioxide will remain bound in the product for a different period and then be released into the atmosphere [5].

Considering that the captured carbon can be further used to produce chemicals and fuels, the question of environmental friendliness and, no less critical, the cost-effectiveness of such technologies is often raised. Studies on the long-term benefits of both CCS and CCSU installations are being conducted in different parts of the world [6]–[9].

Undoubtedly, the environmental friendliness of installations is a vast field for discussion. Considering that such plants allow the use of CO_2 that would otherwise be emitted into the atmosphere (and sometimes will enable removing this CO_2 directly from the air), CCSU plants are beneficial in the long term from an environmental point of view.

Currently, it is CCS installations that can effectively work with large enterprises. This technology can be upgraded to BECCS – Bioenergy Carbon Capture and Storage, and then CCS can generate so-called 'negative emissions' by using carbon dioxide from the atmosphere. Innovative methods could help complete the Paris Agreement [10].

According to the International Energy Agency, to achieve these goals, it is necessary to increase the capacity of such installations tenfold [11]. According to the Global CCS Institute, to achieve this goal, at least 2.5 thousand more carbon dioxide capture units with a capture efficiency of up to 1.5 million tons of CO_2 per year must be installed worldwide by 2040 [12].

At the end of 2020, CCS units were capturing 73 million tons per year, while by the end of 2021, productivity increased to 111 million tons per year [13]. Even though CCS does not directly use carbon dioxide but only allows it to be placed in storage (rather than emitted into the atmosphere), according to [14], net-zero emissions cannot be achieved without such technologies.

Analysing the CCS and CCSU installations, we can conclude that both technologies are still quite expensive due to their high energy consumption [15]. Production with CCS installed uses much more energy than production without it to extract, for example, oil [16]. According to the statements of [13], the cost of installing a CCS depends on many factors – the scope of production, the type and quality of the resource, the extraction of CO_2 immediately from the stream, or whether it needs to be isolated from concentrated stream gas, etc. However, as technology advances, the price of such plants is falling, and plants are becoming more and more the subject of discussions about cheap methods of decarbonisation [17].

Currently, the situation with carbon dioxide in production in the European Union cannot be called even. In some countries, technologies allow the use of CO_2 now, while in others, the

economic and technological base requires additional investments. It is needed to attract extra political leverage and possible funding [18].

The main aim of CCU technologies is to allow 'fossil carbon to be left in the ground'. The [18] also argues that CCU technologies can benefit areas such as cement (carbon enrichment) and energy. CO_2 captured in other processes as a by-product can be redirected to other methods already as a resource. According to a report from the European Commission, products such as urea, methanol, etc., can already be produced using CCU. Using carbon dioxide in the production of fertilisers can be a profitable investment since, in this case, carbon dioxide is embedded in the soil [19], [20].

2. METHODOLOGY

The study consists of descriptive and systematic literature analysis of both international and national legal law regarding the issue of CO_2 emissions. The study included a search and subsequent accounting for CO_2, CCS, CCUS, CCU, carbon/ CO_2 utilisation, carbon/ CO_2 capture, and carbon/ CO_2 storage. The analysis of legislative sources on the opportunities provided for using, capturing, and storing carbon dioxide was based on the political framework, policy instruments, and CO_2 emission utilisation legislation in Latvia and the European Union. Three groups of documents were selected for the systematic literature analysis: EU-level documents, Latvian-level documents, and scientific publications, and each raised its questions (see Fig. 1).

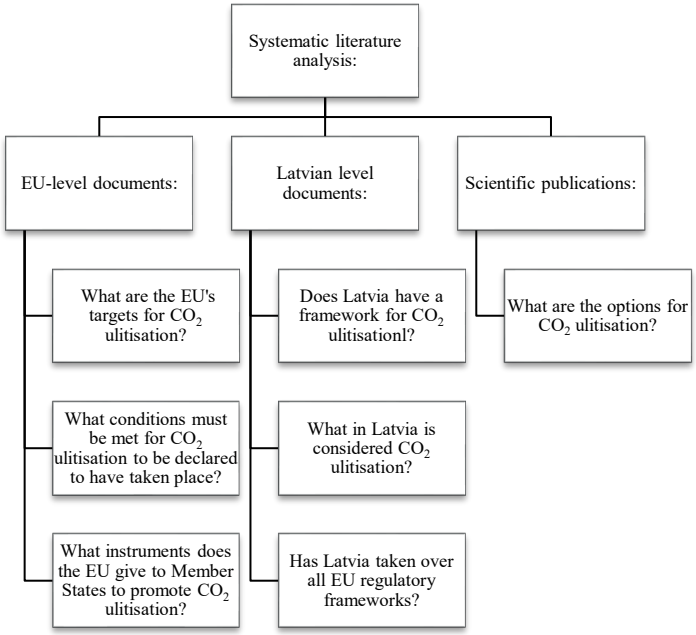


Fig. 1. Systematic literature analysis steps.

Before governing structures make decisions, they must familiarise themselves with the legislation. Each country of the European Union is obliged to comply with the laws of its own country and the laws of the European Union [21]. In parallel, when developing specific steps, the responsible structures should pay attention to similar solutions and their implementation

experience in other countries. Exploring the extent to which the country's government is aimed at capturing/recycling carbon dioxide, this paper analysed the national laws of Latvia and the European Union. Additionally, a study was made on the laws of several countries of the European Union – Great Britain (EU member until 2020), Germany, Sweden, Lithuania, and Estonia. The first three countries are selected based on their technological development. In turn, the analysis of the legislation of Lithuania and Estonia is based on the fact that these two countries are Latvia's neighbours, and laws in these countries are often adopted with an eye to each other. In the case of a positive experience in one country, this decision will likely be made in a neighbouring country.

3. RESULTS

3.1. International Legal Framework

International legislation regarding the protection of the environment has several laws and agreements. Not all adopted documents are binding, but they carry several recommendations and methodologies for both countries and entrepreneurs. These laws and directives primarily aim to mitigate climate change and reduce carbon dioxide emissions.

The Paris Agreement was adopted in 2015 and signed by 191 countries worldwide. The agreement itself is a good step in the right direction. However, the text of the deal is highly inaccurate. The consequences for the country in case of refusal to follow the document are also not described [21]. Besides, the cooperation of countries within the framework of this agreement is weakly specified – it is indicated as ‘voluntary’ rather than ‘desirable’ or ‘obligatory’ [21].

Countries are given the freedom to participate. Any country can withdraw from the agreement three years after its signing [21].

The European Climate Law (also known as Regulation (EU) 2021/1119) is a tool to limit global temperature rise to 1.5 degrees compared to the preindustrial era [22]. The law implies that using the legislation of the European Union; countries must equally reduce the number of created emissions so that by 2050 no EU country produces greenhouse gases. It should be clarified that such a policy requires specific knowledge in science since it sets the methodological recommendations for the European Scientific Advisory Board on Climate Change [22].

As an additional tool for controlling and reducing the number of emissions, the European Union has developed its own emissions trading system. This system aims to reduce the number of emissions created using the economy. All Union countries and EEA members participate in it, making this system the largest in the world [23].

Because not all countries of the European Union are technologically advanced in the same way, a special equalization fund, The Modernization Fund, was created. It is possible to distribute up to 310 million ETS permits within this fund. However, not in all countries, these funds can be implemented. For Latvia, this fund could be beneficial, as it would help enterprises become more efficient and, if possible, switch to renewable energy sources. The country has already applied for investments for 2021–2030 and received 3 968 834 emissions allowances with a value of about 160 million euros [24].

The Investment Fund is the successor to the NER300 program. With a budget of 2 billion euros, this program was created to develop low-carbon technologies with a focus on CCS and innovative technologies for producing renewable energy on an industrial scale [25].

The Innovation Fund is the most extensive funding system that aims to stimulate and support the adoption of innovative low-carbon technologies. The fund receives its funding

mainly from the sale of emission permits. This fund is designed to help businesses that decide to install greener technologies, including CCS, CCU, and similar carbon capture and utilization facilities.

Regulatory changes will further benefit early adopters of CCU technologies shortly. The Commission's proposal creates an incentive to capture and utilize emissions to be permanently chemically bound in the product so that they do not enter the atmosphere during everyday use [26]. Assistance focuses on developing small and large-scale low-carbon technology projects, carbon capture, use, storage technologies, and renewable energy and energy storage methods. Unlike the Modernization Fund, this fund is available to every country in the European Union [27].

CCS Directive assumes that CO_2 will be stored in geological repositories safe for humans and nature. Such storage will allow permanent storage of carbon dioxide, thus releasing the emissions obtained during production, not into the atmosphere but underground holds [28].

The directive is valid throughout the European Union. However, it does not apply to storage facilities with less than 100 kt storage capacity used in research projects [28]. Even though the directive supports the use of CCS, countries are free to choose whether to develop such repositories on their territory or not. The government has the right to completely ban the creation of underground CO_2 storage [28].

The Commission of the European Union intends to promote the development of carbon capture technologies. Both the existing experience and all proposed innovations and projects are analysed. In October 2021, a forum dedicated to the issue of CCUS technologies was held, and this event can be considered a successful step in the right direction. All listed legislative documents of the European Union are summarised in the table below.

TABLE 1. EUROPEAN LAWS AND FUNDS

Name	For whom	Goal
Paris Agreement	All countries who signed the document (191)	To control and limit global temperature rise
European Climate Law	All EU countries	Tool to limit global temperature rise
ETS	All EU countries + EEA	Tool for controlling and reducing the number of emissions
Modernization fund (Kyoto protocol)	BG, EST, LV, LT, HU, RO, PO, CR, SL, CR	To boost technologies; Up to 30 mln. ETS permits
Innovation Fund	All EU countries	To boost CCUS technologies; ~2.5 bln. EUR
CCS Directive	All EU countries	To help implement CCS technologies

3.2. Latvian Legislation on CO_2

As a country of the European Union, Latvia, like any other member state, must comply with the regulations and laws of the Union. If necessary, the National level rules can be changed, however, the legislation of the European Union and the regulations adopted by it is a priority for implementation and cannot be ignored in case of any confrontation with local laws [29].

The Law on Pollution came into force in 2001. The law aims to prevent and/or reduce the negative impact of pollution on human health, property, and the environment and neutralise the consequences of the damage caused by climate change [30]. It is essential to add that this law characterises greenhouse gases. GHGs are claimed to be gases of both anthropogenic and natural origin present in the atmosphere and absorb/reflect infrared radiation. A list of these

gases is – carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), nitrogen trifluoride (NF_3) [30].

Like other countries of the European Union, Latvia participates in emissions trading. In this regard, the Cabinet of Ministers has developed a set of rules that came into force in 2012. According to these rules, the institution responsible for the trade process, the Ministry of Environmental Protection and Regional Development, was appointed. The institution's responsibilities include control over the trading process, supervision of the fulfilment of obligations by buyers, summarising and analysing the information on emissions, and informing the European Commission about the income received from the auction [31].

In 2018, the Cabinet of Ministers developed and launched a methodology for calculating greenhouse gas emissions. The primary purpose of the method is to assess the impact of specific planned and/or already implemented climate change measures. The methodology can be successfully used for various calculations. If necessary, if the conditions of the required measures do not fall under the main algorithm of the method, an alternative calculation method is proposed (Paragraph 10) [32].

This Climate law is still under development. It is supposed to replace the 'On Pollution' [30]. The new law aims to limit climate change and ensure adaptation to climate change in the country. This is expected to be achieved by reducing anthropogenic emissions and increasing carbon sequestration by 2050, achieving the primary goal of climate neutrality. This result is planned to be maintained and improved up to harmful emissions in the future.

The focus should be on paragraph 42, which stands for:

- On the territory of Latvia, in its exclusive economic zone and on the continental shelf, storage of carbon dioxide in geological structures and the vertical water layers is prohibited;
- The Cabinet of Ministers approves the procedure in which the storage of carbon dioxide is possible in cases not mentioned in the first part of this paragraph [33].

The second point is an essential difference from the previous law, 'On Pollution,' the difference from which the new one makes it possible to consider specific projects in private by the Cabinet of Ministers. This means that projects aimed at capturing and storing CO_2 are potential in the future. Additionally, the law stipulates that the Cabinet of Ministers is responsible for the procedure for transporting carbon dioxide, as well as for determining the course for its use [33].

In Latvia, greenhouse gas emissions are controlled in five sectors: energy (excluding transport), industry, agriculture, land use and forestry, and waste management. The control looks like a multilateral accounting that includes greenhouse gas and CO_2 calculations and information from the emissions trading register [34]. Data on emissions are publicly available and include detailed information – which company, for which year, how many, and what emissions were produced [35]. Additionally, it is possible to analyse emissions based on the category of the enterprise (category – permit for polluting activity). Data for each enterprise is available on the Valsts Vides Dienests website (eng. – State Environmental Service) [36]. The amount of CO_2 in Latvia has increased slightly. However, as the trendline shows, the increase is still observed. In 2019–2020, emissions decreased due to the reduction of production scale due to the quarantine caused by Covid-19 [37]. However, emissions are expected to return to or exceed previous levels if high electricity prices force producers to switch to less environmentally friendly resources, such as coal [38]–[40]. This means that the amount of CO_2 emissions will increase.

In February 2020, the National Energy and Climate Plan for 2021–2030 was adopted. The document determines the basic principles, goals, and directions of action of the Latvian state energy and climate policy for the next ten years, taking into account the outlined long-

term development directions. This plan sets out goals and ways to achieve them in various sectors. These include reducing greenhouse gas emissions and increasing the market share of renewable energy. This step will significantly improve the efficiency of the energy sector and promote the introduction of innovative technologies in the manufacturing industry. An additional advantage will be an increase in the competitiveness of enterprises, which, in turn, will have a positive effect on the economy as a whole [41]. This document pays little attention to carbon capture and/or storage systems but, at the same time, states that in the future, cooperation with other countries on innovative technologies (CCU, hydrogen, etc.) will be sought. It is also planned to increase CO_2 capture and storage systems investment up to 2 % (in the previous period, 2014–2018, it was 0 %) [42].

Action Plan for Reducing Air Pollution 2020–2030 was developed within the law 'On Pollution' [30]. The action plan aimed at reducing the number of emissions was created in 2020 and is designed for ten years. The main idea of the document is to reduce the negative impact of pollution on the environment. This document differs from other documents in that it aims to reduce costs and loss of working time caused by air pollution due to health problems and visits to the doctor [43]. The plan is expected to help Latvia meet the emission reduction targets set by the European Union by 2020, 2025, and 2030. Additionally, the program should improve the quality of human life and health and improve the state of the ecosystem and air quality in Latvian cities. Implementing the measures included in the plan will also reduce greenhouse gas emissions, promote innovation, and increase the competitiveness of technologies. All listed legislative documents of Latvia are summarised in the table below.

TABLE 3. LEGISLATIVE DOCUMENTS ON CO_2 IN LATVIA

Name	Goal
Law on Pollution	To prevent and/or reduce the negative impact caused by climate change.
Procedure for auctioning emission allowances allocated in Latvia	Set of rules for emission trading
Methodology for Calculating Greenhouse Gas Emissions	To assess the impact of specific planned and/or already implemented climate change measures.
Climate Law	To limit climate change and ensure adaptation to climate change in the country. Under development. Will replace the law 'On Pollution'
GHG Monitoring and reporting	Procedures for monitoring, calculating, and reporting the GHG emissions
Air Pollution Reduction Action Plan 2020–2030. year	Developed within the law 'On Pollution' Aimed at reducing the number of emissions, costs, and loss of working time caused by air pollution due to health problems and visits to the doctor
National Energy and Climate Plan	Determines the basic principles, goals, and directions of action of the Latvian state energy and climate policy

3.3. Legislation in Other EU Countries

3.3.1. Great Britain

Under The Climate Change Act [44], adopted in 2019, the UK has to achieve zero emissions by the 2050 and 78 % by 2035 [45], [46]. This law was positively adopted, as it involves the transformation of the energy sector and a significant simplification of the solution to climate change issues [47]. However, several additional policies and measures have been created to achieve the set climate targets. Specifically, the following points are relevant to emissions:

New Emissions Trading Scheme; Contracts for Difference, Climate Change Levy [48] In parallel with the legislation, CCS projects are also being developed. In 2015, a competition with a budget of ~1.18 billion euros for CCS development ended [49]. There are plans to build carbon storage facilities in the North Sea, and in the north-eastern part, it is planned to create a network for transporting and storing carbon dioxide. It is assumed that thanks to this network, it will be possible to transport gas from all over Europe [50]. The UK government has also announced that it will be phasing out coal burned at stations not equipped with CCS [51].

3.3.2. Germany

Germany has raised the percentage of reduction in greenhouse gas emissions. However, unlike the UK, not so much – 65 % by 2030 and 88 % by 2040 [52]. Unlike the UK, which introduced the first unified climate law in 2008 [47], Germany did not have a similar direction until 2019. In 2021, the German Bundestag introduced reforms to Climate Law. The rules for reducing emissions by 65 % and 88 % by 2035 and 2040, respectively, are written for the LULUCF sector. It is planned that by 2045 the industry will become negative by 35 million tons of CO_2 emissions. Additionally, the law of permanent storage of CO_2 in holds is prescribed [53]. It spells out the rules potentially allowing medium-sized CCS pilot projects. However, not all states are allowed to develop the project, and many forms of Germany have introduced a ban on CCS projects in their territories. The deadline for submitting applications for the development of storage facilities ended in 2016, and at the moment, it is possible to launch only a project approved before the designated year. The CO_2 Storage Act was planned to ensure the permanent storage of CO_2 in underground storage of earth rocks in the most environmentally friendly and sustainable way. The law regulates the complete analysis of the stones and the CCS project itself. The act would provide annual storage of up to 1.3 Mt CO_2 with a maximum storage capacity of 4 Mt CO_2 per year. Despite the closure of the initiative in 2018, opinions began to be expressed about the resumption of projects in the direction of storage and utilization of CO_2 (CCS and CCU). The idea of natural storage can be used in cases where production does not use coal or gas energy. It was suggested that these technologies could be used to protect the climate in industrial processes [54].

3.3.3. Sweden

In June 2017, the Swedish government decided to introduce amendments to climate policy. The main modification is introducing a framework, as it determines the implementation of the Paris Agreements in the country. Sweden has said it will achieve zero greenhouse gas emissions by 2045. An 85 % reduction is planned by modernising equipment, introducing innovative technologies, and abandoning fossil fuels. The remaining 15 % reduction will be completed by accumulating CO_2 in forests and land and the active use of CCS technologies [55]. It is planned that carbon capture technologies will be able to reduce emissions associated with both fuel use and various technological processes. The cement industry is currently considered the most natural area for CO_2 capture installations – the combination of CCS installations and bioenergy can significantly reduce greenhouse gas emissions in the long term. A guide to implementing carbon capture and storage technologies has also been developed. It should be noted that this policy is aimed not only at large producers of emissions but also at smaller ones [56], [57]. Additionally, the government has established a National Center for CO_2 Capture and Storage. Financing is provided to capture and subsequent storage of CO_2 created from renewable energy sources (creation of the so-called biological CCS) [58]. Industrial Leap is also a severe document, the development of

which began in 2018 and will end in 2040. The main goal of the reform is the transition of the manufacturing sector from old technologies to those that do not produce emissions in the process. One of the options for such technologies is producing energy using CCS installations. A positive aspect of this document is that the grant is available to manufacturers and researchers in this field [58].

3.3.4. Lithuania

Lithuania is included in the list of countries in the Baltic region in which carbon dioxide storage systems have been actively developed. In 2011, the country's legislation fully implemented the EU directive on CO_2 storage [59]. However, in 2020, the Lithuanian government banned any projects to capture and store CO_2. This decision was justified by concerns about the risk of underground water contamination with liquid carbon dioxide [60], [61]. According to [60], this decision is the most negative for the region for 2020, as it prohibits any placement of carbon dioxide underground in artificial and natural storage and any work and development in this direction. Despite the adopted law, in the country's National Development Plan for 2021–2030, ideas appear for developing systems for capturing, using, and underground storage of carbon dioxide. Such a change of opinion is due to the possibility of using the European Innovation Fund to develop CCS and CCU technologies [62]. In addition, the chances of modernizing the production sector are being considered. The technical and economic aspects of carbon dioxide capture installations and their subsequent use and storage in specialized storage facilities in Lithuania are assessed. The plans also include a detailed analysis of the payback and feasibility of this type of project compared to other countries of the EU Common Economic Space (countries to which the carbon dioxide captured in Lithuania could be redirected) [62].

3.3.5. Estonia

The carbon dioxide use and storage legislation in Estonia is not very developed. There is a law to reduce emissions [63], which refers to the need to modernize the manufacturing and energy sectors. Another document is the government action program [64]. This document already pays more attention to CCS technologies. It is planned to pay more attention to competitive, low-carbon technologies in the country's future. The following document is already more detailed in this type of question. The NECP 2030 National Plan is a communication drawn up by the requirement of the Parliament of the European Union (No 2018/1999). The plan proposes modernizing the manufacturing and energy sectors, motivating producers to use CO_2 storage facilities, and using energy obtained from non-fossil sources [65]. The 2021 report of the country's energy sector proposes introducing CCS and CCU systems. This technology would help the government fulfil its emissions reduction plans [66]. From a financial point of view, the authors of the document admit that at current prices for CO_2 quotas (as of March 2021, the cost was ~40 EUR per ton), it is more profitable to invest in the development and construction of infrastructure for capturing, cleaning, transporting and storing carbon dioxide. And although CCS and CCU technologies are costly and require significant investments, in Estonia, additional funding from European grants for developing CCS/CCSU technologies was not yet attracted. In addition, the document proposes several levers to encourage the introduction and use of CO_2 capture and storage systems – subsidies, capital grants (for the construction phase), investment tax credits/incentives, production subsidies, production tax deductions (for companies producing CCS/CCU), feed-in tariffs for products using CCS/CCU technology, as well as a price

surcharge for all products using CCS/CCU [66]. All listed legislative documents of mentioned EU countries are summarised in Table 4.

TABLE 4. LEGISLATIVE DOCUMENTS ON CO_2 IN EU COUNTRIES

Country	Document	Goal
Britain	The Climate Change Act	To transform the energy sector, simplify the pollution of climate change issues.
	New Emission Trading scheme	Replaces EU scheme after UK left the EU
	Contracts for Difference	To fixate price on low-carbon energy. To motivate the utilization of low-carbon energy.
	Climate energy Levy	To motivate companies to increase energy efficiency.
Germany	Federal Climate Change Act	To transform the energy sector, simplify the pollution of climate change issues.
	Climate Law	To unfasten emission reduction; to optimize the LULUCF sector.
	Carbon Dioxide Storage Act	Rules for CCS project construction and utilization
Sweden	Climate Act	Provisions on the climate policy
	Industrial Leap	Support the production sector's transition to zero-emission technologies
Estonia	Governmental Action Plan	To implement low-carbon technologies.
	National Action Climate Plan (NECP) 2030	To modernize production and energy sectors by implementing innovative emission-control technologies
Lithuania	National Energy and Climate Plan 2021–2030	To modernize production and energy sectors by implementing innovative emission-control technologies.

Despite the poorly developed legislation on CO_2 use in the Baltic States, options for cooperation between Latvia and Estonia are being actively discussed and analysed. During this cooperation, Estonia could potentially supply Latvia with CO_2, where it would be subsequently buried. Latvia has delicious geological layers suitable for storing CO_2 from the Baltic region [60], [67].

The onshore CCUS scenario includes capturing CO_2 emissions from the largest emitters in Estonia and Latvia (mainly in the energy sector) and storing these emissions in North Blidene storage (Latvia). The scenario assumes that the project's construction will take about two years and last about 30 years. According to the system, the storage could hold about 204 Mt CO_2 [8].

4. CONCLUSION

To achieve the goals to reduce carbon dioxide emissions, countries must optimize production processes and change the legal framework. The possibility of using sustainable carbon cycles can be a solution to the problem of emissions in the world and boost economic and technological development. However, these technologies must be specified in the legislation.

This work analyses the legislative framework for capturing and using carbon dioxide in the European Union, many of its countries, and Latvia. Currently, the use of CO_2 capture and storage technologies is poorly specified both in the laws of the European Union and in the rules of individual countries. Despite this, the EU motivates and stimulates the active development of such technologies throughout the Union by offering financial assistance to

projects. In some countries, the government is also actively involved in technology transfer to be more ecological and environmentally friendly.

The disadvantage of the issue of CCS and CCU technologies is the too low level of public awareness (and sometimes the political sector) about these technologies – what they are, what they are for, and what advantages they bring. As the analysis showed, such countries as Lithuania and Germany abandoned CCS projects precisely under pressure from the public/politicians. Recently, however, people's opinions have begun to change. Additional research is needed for a more active introduction of innovative technologies and to determine the public's view. An analysis of the willingness to pay could undoubtedly help determine the education and awareness of people in matters of CO_2 emissions and their attitude to this topic.

Developing legislation that motivates entrepreneurs to use low-carbon technologies, including CCS and CCU, is necessary. It is essential to indicate all the benefits that an entrepreneur, as a direct 'producer' of emissions, will receive from acquiring innovative technologies and what disadvantages an adverse decision may have. Society – the public, entrepreneurs, and politicians must realize the need to change since only through change can success be achieved in preserving the climate and the environment.

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