

BUILDING MOMENTUM  
FOR THE LONG-TERM CCS DEPLOYMENT  
IN THE CEE REGION

# CCS National Roadmap

Slovenia

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# Chapter 1. Role of CCS in decarbonisation pathways

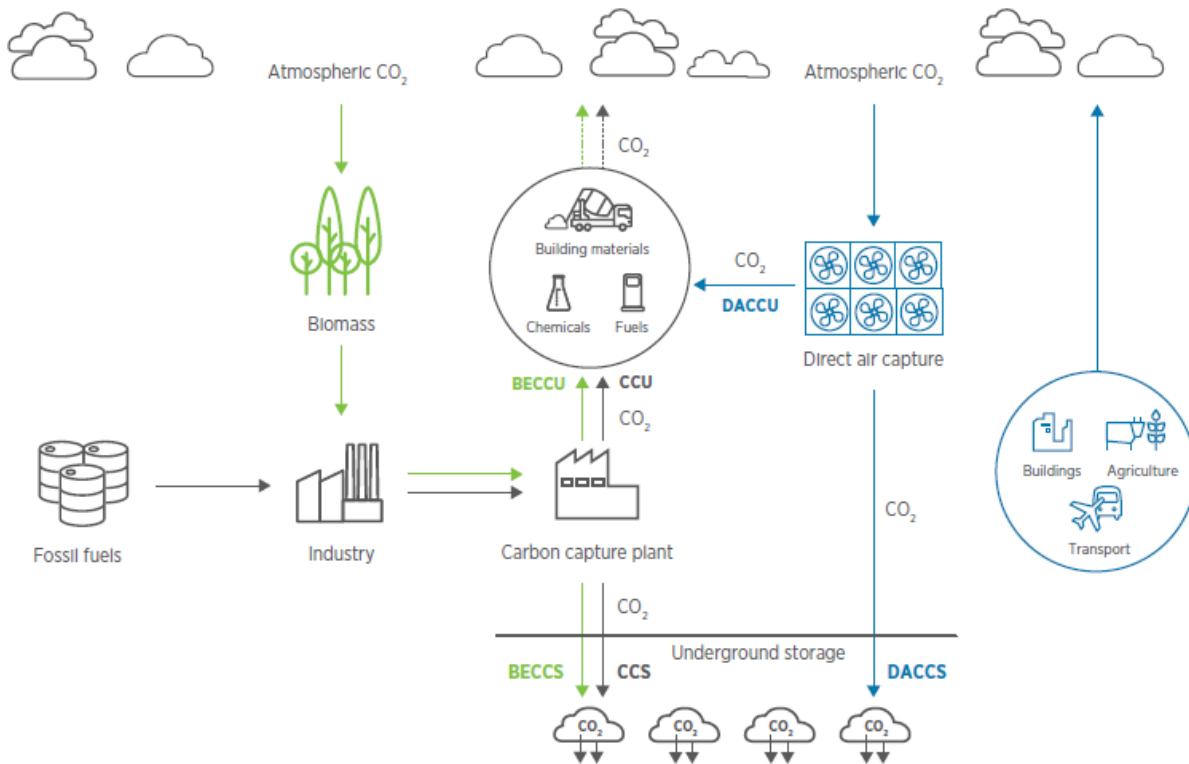
In 2019, the EU launched the European Green Deal to transform the EU into a modern, resource-efficient and competitive economy, cut GHG emissions by at least 55% by 2030 and reach net-zero emissions by 2050. Many 1.5°C compatible scenarios have assessed these targets and shown that a credible but narrow pathway exists and will require the use of all decarbonisation tools available. **Renewables and energy efficiency** are key components of that pathway and account for 80% of emissions reductions and provide solutions to many sectors including power, transport and energy-intensive industries. But to reach net-zero renewables and energy efficiency, they **need to be supplemented by CO<sub>2</sub> capture and storage (CCS) and utilisation (CCU) and carbon dioxide removal (CDR)** (particularly bioenergy with CCS/CCU (BECCS/BECCU)) **technologies** (Figure 1), in sectors such as power and heat, cement, steel, chemicals production and waste incineration. In addition, to address emissions from other sources as well as historic emissions, direct air capture with storage (DACCS) or utilisation (DACCU), can also be deployed. These technologies together can mitigate **20% of global CO<sub>2</sub> emissions**, but to do so, **the scale has to increase significantly** (Figure 2), from the current 0.04 Gt of CO<sub>2</sub> per year to circa 8.5 Gt of CO<sub>2</sub> per year in 2050 (IRENA, 2021).

The benefit of CDR processes is that they remove CO<sub>2</sub> from the atmosphere, they do not simply reduce what was added, and in combination with long-term storage can result in negative emissions. As such they are a critical component of net-zero pathways in the European Green Deal and most recently in line with the Glasgow Climate Pact. There are preconditions to be assessed: biomass for BECCS needs to be sourced sustainably, while DACCS requires access to cheap renewable energy.

All these technologies utilise the same components of the value chain: the CO<sub>2</sub> transport, storage and utilisation.

Currently, Slovenia's Long Term Climate Strategy, Industrial Strategy and National Energy and Climate Plan (NECP) acknowledge the use of CCS. The NECP sees CCS potentially playing a role in both energy intensive industries and electricity generation sectors, while only within the latter application on Unit 6 of Thermal powerplant Šoštanj (TEŠ) could lead to 1.800 – 2.250 kt CO<sub>2</sub>/year captured and compressed between 2035 and 2050 (taking into account 90% capture rate). Main assumptions in the NECP scenarios Storage of CO<sub>2</sub> is in Slovenia forbidden under current legislation.

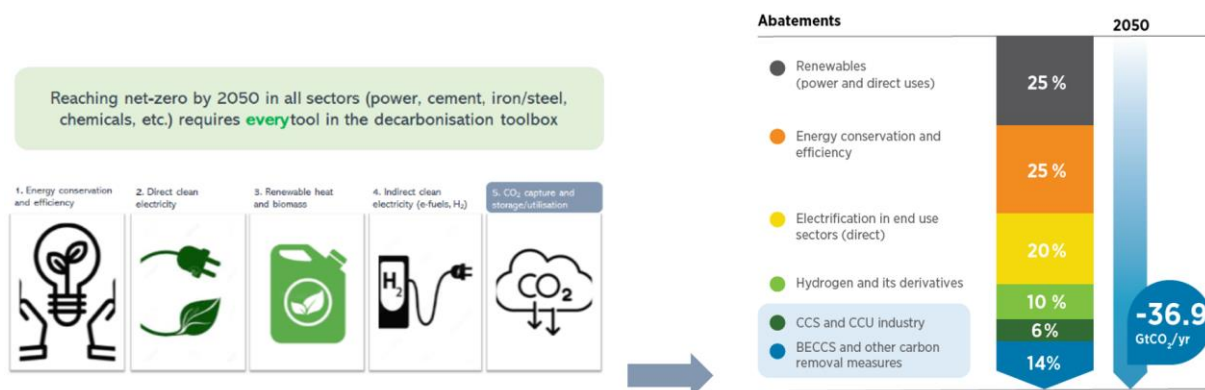
Figure 1: Carbon cycle with the use of CCS/CCU, BECCS/BECCU and DACCS/DACCU technologies<sup>1</sup>



Source: (IRENA, 2021)

<sup>1</sup> [https://irena.org/-/media/Files/IRENA/Agency/Technical-Papers/IRENA\\_Capturing\\_Carbon\\_2021.pdf](https://irena.org/-/media/Files/IRENA/Agency/Technical-Papers/IRENA_Capturing_Carbon_2021.pdf)

Figure 2: Carbon capture and storage as a part of the global decarbonisation toolbox<sup>2</sup>



Source: Based on IRENA (2021)

The pace of progress in validating and deploying these technologies across sectors has been slow to date and in many cases with significant costs overruns. There are currently many commercial CCS, CCU and CDR plants globally capturing 40 Mt of CO<sub>2</sub> per year (IRENA, 2021), with many more being developed and an increasing number of pilot and demonstration projects that focus on safety issues, environmental impacts and economic costs, while generating lessons learned to be used to further improve these technologies and bring their costs down.

This current momentum to speed up energy and industrial transition considers these technologies as its necessary component of the transition and **activities at the national and regional levels** may help to **enhance the collective understanding** of the issues surrounding CCS, CCU and CDR, **build confidence** and **scale up their deployment** to **reduce costs** of these technologies and related infrastructure.

<sup>2</sup> Ibid.

# Chapter 2. Opportunities and barriers for deployment of CCS and its related technologies in Slovenia

## I. Emissions and energy mix in Slovenia

Largest consumers of energy in Slovenia remain transportation and industrial sectors, while electricity generation is evenly supplied by nuclear power, hydroelectricity and coal, with small percentage also coming from photovoltaics and natural gas.

The energy intensive industry sector in Slovenia is a significant contributor of CO<sub>2</sub> (and other GHG) emissions, as well as to the overall Slovenian GDP (2.5%). Approximately half of all CO<sub>2</sub> emitted in 2018 in Slovenia came from point sources that could implement carbon capture technologies.

The energy mix in 2020 in Slovenia is dominated by fossil fuels, followed by nuclear and hydropower.

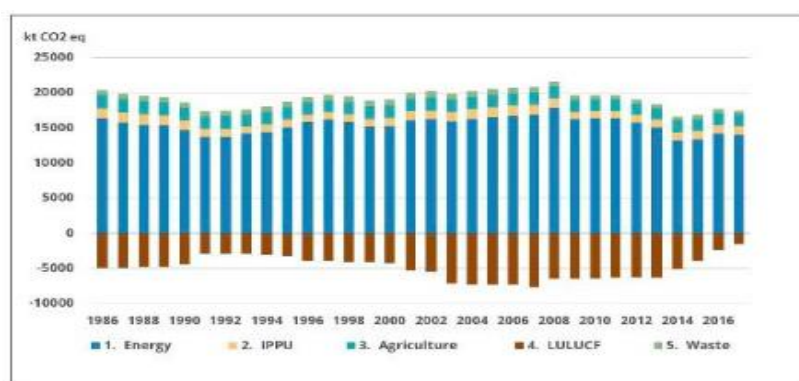
Coal	Oil	Nuclear	Natural gas	Biofuels and waste	Wind and solar	Hydropower
16%	29%	25%	11%	<1%	1%	17%

- In 2018, total GHG emissions were 17,5 MtCO<sub>2</sub>eq, out of which energy-intensive sectors in industry represent 17.2 % emissions (from fuel use and energy processes) - 3.0 Mt CO<sub>2</sub> eq], out of that different sectors contributed the following percentage:

Total energy-intensive sectors	% from 17.2 % emissions
Iron and steel	20%
Paper and paper products	12%
Chemicals	5%
Non-metallic mineral products (glass, etc.)	35%
Other	28%

Key contributors of CO<sub>2</sub> emissions from the energy intensive industries are cement and aluminium producers, Salanit Anhovo and Talum, with respective CO<sub>2</sub> emissions of 196kt and 612kt in 2017 (or 3% and 9% of all CO<sub>2</sub> emissions within the ETS sector), as well as thermal powerplant Šoštanj in the power generation sector, which accounted for 4073kt of CO<sub>2</sub> emissions (or 62% of all CO<sub>2</sub> emissions within the ETS sector).<sup>3</sup> These three actors, at present, hold the most potential for application of CCS technologies in Slovenia.

Figure 1. GHG emissions in Slovenia by sector



Source: UNFCCC, 2020.\*<sup>4</sup>

## II. State-level strategic approach towards CCS/CCU deployment

While there is recognition of CCU/CCS in Slovenian national planning documents there is a lack of clear ambition to develop the technologies. It is mentioned in the Slovenian **National Energy and Climate Plan, the Long-Term Climate Strategy**, and the **Slovenian industrial strategy**. Whereas the first two refer to the technologies as potential pathways for Slovenia to achieve carbon neutrality, the latter notes that the technology is proven yet not economically feasible.

There is a clear need for a strategic approach towards CCU/CCS implementation and deployment in Slovenia, as currently the technology lacks political momentum that would spur pilot and demonstration project development, and consequently allow for large scale projects to be deployed.

## III. National CCS/CCU legislation and regulatory barriers

While the CCS Directive has been implemented to the Slovenian legal system, there are no specific CCU/CCS regulations in place. Key barrier to CCS projects remains the Environment Act which does not allow any CO<sub>2</sub> storage in Slovenia. CO<sub>2</sub> utilization is not covered by Slovenian legal acts, however, there are no legal or regulatory barriers at present either.

## IV. Level of knowledge and experience and future outlook for CCU/CCS in Slovenia

There is quite a large gap in terms of knowledge and experience with CCU/CCS technology in Slovenia. Whereas the civil society and NGO's view it as an unnecessary and expensive tool that would allow for continuation of use of fossil fuels, several industry stakeholders, namely the cement manufacturer Salanit Anhovo,

<sup>4</sup>IPPU: Industrial Processes and Product Use.

see it as a decarbonisation tool. While CCU/CCS is mentioned in national policy documents, employees of various ministries do not realistically see it as a decarbonisation tool.

Only Salanit Anhovo is currently in process of developing a pilot CO<sub>2</sub> capture project by 2028, with potential for large scale deployment by 2035. There is also some research activity in the National Chemistry Institute and universities on CO<sub>2</sub> capture methods.

Public perception of CCU/CCS in Slovenia is limited, namely in terms of low awareness of the process itself, and low acceptance (where awareness exists). With effective engagement, however, public opposition (from the project developer's perspective) should not pose a major barrier to project development in Slovenia.

There are no significant infrastructure barriers for CO<sub>2</sub> transport in Slovenia. Given that CO<sub>2</sub> storage is not allowed in Slovenia, complemented by public opposition issues (i.e. stemming from mistrust in government policies), it is most likely that regional clusters (namely with Italy and Croatia) will determine the level of CCU/CCS deployment in Slovenia.

## V. Key stakeholders and their overall positions

No.	Type of institution	Institution	Overall position
1	institutional (public administration, government agency)	Ministrstvo za okolje in proctor (Ministry of Environment and Spatial Planning)	Fence sitter
2		Ministrstvo za infrastrukturo (Ministry of infrastructure)	Fence sitter
3	private sector and state-controlled firms	Salanit Anhovo (cement manufacturer)	Pace setter
4		Talum (aluminium manufacturer)	Fence sitter
5		Vipap Videm (paper manufacturer)	Fence sitter
6		Energetika Maribor (energy supplier)	Pace setter
7		Termoelektrarna Šoštanj (energy producer)	Pace setter
8	academic and research institutions	Institut Jožef Štefan	Fence sitter
9		Kemijski Institut (National Institute of Chemistry)	Pace setter
10		Geološki zavod Slovenije (Geological Survey of Slovenia)	Fence sitter
11		Geoinženiring	Fence sitter
12		Univerza v Mariboru (University of Maribor)	Fence sitter
13		Univerza v Ljubljani (University of Ljubljana)	Fence sitter



# Chapter 3. Policy roadmap for the scaled-up deployment of CCS and its related technologies in Slovenia

The roadmap provides an overview of various ambitious policy actions along the innovation cycle, from research and development to potential commercialisation of these technologies in order to reach climate targets set by the EU and national strategies. While the roadmap aims to create an enabling environment to deploy CCS projects, it increasingly focuses on ways to develop transferable knowledge and skills by national stakeholders (governments, research organisations, academia, private sector) in one or more stages along the carbon capture, transport, storage and utilisation chain, and create linkages to gain knowledge and experience from more experienced stakeholders across the globe. It also underlines the importance of cross-border activities and joint regional demonstration projects to increase stakeholder access to funding considering their different geographies.

Technical note:

Each group of actions has a specific name and is divided into single actions that could be done by specific stakeholders within a proposed time frame.

- Short-term – actions to be done from now to 2025
- Mid-term – actions to be done between 2025 and 2030
- Long-term – actions to be done after 2030

In addition, while the current Ministry of Environment and Spatial Planning is responsible for matters related to climate change, in light of recent government changes in Slovenia, this is likely to fall under the remit of a newly proposed Ministry of Climate Change and Energy, which is already incorporated into the Roadmap.

## A) Scaling-up RD&D activities and building national knowledge and experience

Key action	Number	Approach	Stakeholders	Timeline
<b>Knowledge platforms</b>	A1.0	As awareness of CCS in Slovenia is low, knowledge platforms should be created to share best practice and data and facilitate public and private communication and risk quantification. The private and academic sectors should take joint lead on the efforts.	Private sector, academic and research institutions, NGOs, civil societies, public sector (ministries)	Short-term
	A1.1	Establish a platform/advocacy group for CCS through existing mechanism of the Chamber of Commerce in order to facilitate advocacy efforts and interaction between stakeholders and the public.	Private sector	Short-term
	A1.2	Create social interactions (roundtables, conferences) to attract local and international attention by inviting foreign experts, advisors or researchers and show/create a sense of commitment to a global approach.	Private sector, academic and research institutions, NGOs, civil societies, public sector (ministries)	Short-term
	A1.3	Develop partnerships; in the private sector, academic and research institutions and the civil society.	Private sector, academic and research institutions, NGOs, civil societies, public sector (ministries)	Short-term
<b>Engagement with international fora</b>	A2.1	Slovenian stakeholders, including pace-setter companies, academic and research institutions (such as Salonit Anhovo, IJS, Geološki zavod Slovenije) should join Zero Emission Platform (ZEP), Clean Energy Ministerial (and its CCS group), Carbon Sequestration Leadership Forum, EERA CCUS, EC-CSEL, European Climate Foundation CCS Hub (for NGOs), IEAGHG.	Private sector, academic and research institutions	Short-term
	A2.2	The government, namely Ministry of Climate Change and Energy, and private stakeholders must work together in engaging in dialogue with neighboring countries on securing an aligned approach for storage, as national (local) storage projects in Slovenia are unlikely to occur.	Ministry of Climate Change and Energy	Short-term

	A2.3	Slovenia should become a participating SET Plan country for the CCU-CCS Implementational Working Group.	Ministry of Climate Change and Energy	Short-term
<b>Identifying industrial hubs, clusters, CO<sub>2</sub> transport networks</b>	A3.0	In Slovenia, there are no existing industrial hubs per se, however, due to the geographical size of Slovenia, the single point emitters are not excessively far away from each other and could still benefit from a cluster approach of a joint CO <sub>2</sub> transport infrastructure.	Public sector, civil society	Mid-term
	A3.2	The ministries and the civil society must acknowledge that the development of shared infrastructure is a prerequisite and can act as a trigger for new private investments.	Public sector, civil society	Mid-term
	A3.4	Possibilities for of waste-to-energy (WtE) coupled with CCS in cities/municipalities as another form of hub/cluster must be explored further.	Private sector, government, NGOs, civil societies, universities	Short-term
<b>Funding and financial support for RD&amp;D projects</b>	A4.1	To initiate single-source CCS pilots and demonstration projects for field testing and technology advancement nationally and regionally, the government must provide incentives to mobilise private capital. Primarily through the Climate Fund.	Public sector	Short-term
	A4.2	A single platform covering all published tenders that draw from the Climate Fund, regardless of the tenderer should be established. The same goes for regional and other tenders – currently, they are covered by different ministries and governmental services.	Ministry of Climate Change and Energy	Short-term
	A4.3	The public sector should hold more formal and informal workshops on funding opportunities that would also raise awareness among private sector stakeholders.	Private sector, public sector	Short-term
	A4.4	Since first-movers (i.e. Salanit Anhovo) face higher costs and risks, guarantees for revenue should be provided during the early stages of deployment, i.e. by using Regulated Asset Base model, to drive development of transport and storage infrastructure component of CCS. The inspiration for the model can be sought in the UK's TRI model for CCUS. <sup>5</sup>	Ministries (of Climate Change and Energy; Finance; Economic Development and Technology)	Mid-term
	A4.5	Government must implement a strong and clear policy framework and work with project developers in providing EIB and other types of loan guarantees.	Ministries, private sector	Mid-term

<sup>5</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/946561/ccus-business-models-commercial-update.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/946561/ccus-business-models-commercial-update.pdf)

	A4.6	Government should appoint a national contact point, to assist Slovenian companies/project developers in applying for and accessing EU and other funds and to facilitate cross-border collaboration.	Ministry of Climate Change and Energy	Short-term
<b>Storage site exploration</b>	A5.1	The Ministry of Finance and Ministry of Climate Change and Energy should support new storage site location and exploration funding through the Climate Fund or other mechanisms.	Ministry of Climate Change and Energy, Ministry of Finance, Geological Survey of Slovenia	Mid-term
<b>Bridging the valley of death</b>	A6.1	Private companies should work together with consulting companies and government institutions to finance and develop feasibility studies and a national CCS strategy.	Public sector, private sector	Short-term
	A6.2	The Ministry of Climate Change and Energy, together with other stakeholders, should communicate to the European Commission on the need to support developing CO <sub>2</sub> transport infrastructure, in particular on non-pipeline modes (i.e. rail, barge, trucks), as well as allowing such projects to be eligible for PCI status and CEF funding.	Ministry of Climate Change and Energy, private sector, academic and research institutions	Short-term
<b>Bridging the valley of death</b>	A6.3	The ministries, and other stakeholders, should visit and monitor the development of a pilot CO <sub>2</sub> capture plant at Salonit Anhovo.	Ministry of Climate Change and Energy, private sector, academic and research institutions	Short-term

## B) Policy, standards and regulations

Key action	Number	Approach	Stakeholders	Timeline
<b>Policies</b>	B1.1	The government should look to follow a number of best practices in policy-making on CCS elsewhere in Europe, that are focused strongly on cross-border cooperation, including Sweden – the Preem CCS project <sup>6</sup> , Norway –	Government	Short-term

<sup>6</sup> <https://www.sintef.no/en/latest-news/2020/new-plaunch-of-swedens-largest-carbon-capture-and-storage-plantage/>

		Longship, <sup>7</sup> the UK – Ten Point Plan for a Green Industrial Revolution & The Carbon Capture and Storage Infrastructure Fund. <sup>8</sup>		
<b>Guidelines and standards</b>	B2.1	To make processes such as permits issuance, financial de-risking of investments, and ensure reliability/safety of projects over long-term, international standards could be adopted by national institutions for standards, such as the Slovenian Institute for Standardisation (SIST). <sup>9</sup>	Slovenian Institute for Standardisation, International Organisation for Standardisation, industrial stakeholders	Mid-term
<b>Regulatory framework</b>	B3.1	In case of CO <sub>2</sub> pipeline transport, the rights and obligations for CO <sub>2</sub> transport could be transferred via a licence to the Slovenian natural gas TSO Plinovodi that owns this licence for natural gas transport.	Ministry of Climate Change and Energy	Long-term
	B3.2	The Environmental Protection Act, which prohibits geological storage of CO <sub>2</sub> could be amended to “allow for storage in abandoned oil and gas fields and other suitable geological areas.”	Ministry of Climate Change and Energy	Long-term
<b>Strategies for CCS application for industrial decarbonisation and climate neutrality of the economy</b>	B4.1	The NECP which will be amended in 2023 should be used as a basis to draft decarbonisation pathways and highlight the role of CCS, in particular in the energy intensive industry sector.	Government	Short-term
	B4.2	The upcoming Comprehensive strategic decarbonisation project through the transition to a circular economy (CSDP) should include strategic plans for the deployment of CCS technologies, including plans for the establishment of industrial clusters and setting up shared infrastructure for CO <sub>2</sub> transport with neighbouring countries.	Government	Short-term

<sup>7</sup><https://www.regjeringen.no/en/topics/energy/landingsider/ny-side/sporsmal-og-svar-om-langskip-prosjektet/id2863902/>

<sup>8</sup>[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/936567/10\\_POINT\\_PLAN\\_BOOKLET.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf)

<sup>9</sup> ISO technical committee 265, has already developed some standards for carbon dioxide capture, transportation, and geological storage.: <https://www.iso.org/committee/648607/x/catalogue/>

	B4.3	There are no national strategies regarding targets for blue hydrogen production, bioenergy CCS, direct air CCS or waste-to-energy <sup>10</sup> with CCS. More effort is needed to raise awareness and promotion of these policies, through workshops and roundtables with all stakeholders.	Government, consulting companies, academic and research institutions	Short-term
<b>Enabling environment for CO<sub>2</sub> market</b>	B5.1	To create the CO <sub>2</sub> market the EU must set the foundations for a transition towards a climate-neutral economy and incentivise decarbonised industrial products.	The European Commission, the government, relevant ministries	Mid-term
	B5.2	Carbon pricing and policy options such as CCfDs could be provided by the government(s) to investors. This could provide a push for many innovative low-carbon production processes for materials such as steel, cement, or aluminium. Fiscal incentives such as the US reformed 45Q tax credit could be considered.	The European Commission, the government, relevant ministries	Mid-term
	B5.3	Support mechanisms which will help to create the initial market for CCU products and provide funding support for industrial upscaling of pre-commercial scale installations, such as the Innovation Fund and IPCEI, will be of the utmost importance to kick-off the development.	The European Commission, government, relevant ministries	Mid-term
<b>Resilience of CCS strategies</b>	B6.1	A parliamentary group on industrial decarbonisation could be created, or at least, the importance of CCS should be discussed at the relevant parliamentary hearing.	Parliament, government	Short-term
	B6.2	If, as proposed in the LTS, a scientific committee on climate change is established, it should include CCS on the list of its priorities.	Parliament, government	Short-term

<sup>10</sup> heat and electricity producer and distributor Energetika Maribor is currently looking, as part of their decarbonisation plans, at possibilities of waste-to-energy CCS at their proposed waste-to-energy plant in Maribor.

## C) Stakeholder engagement, cooperation & know-how dissemination

Key action	Number	Approach	Stakeholders	Timeline
<b>Engagement with stakeholders</b>	C1.1	The national CCS forum/advocacy group that would operate within the Chamber of Commerce or as a stand-alone platform should be financed from the Climate Fund. Its goal will be to engage with all stakeholders and through various types of analysis seek to find consensus on the importance of CCS for Slovenia.	Private sector, academic and research institutions, NGOs, civil societies, public sector (ministries)	Short-term
	C1.2	To reach civil society, digital advocacy should be implemented by the private sector and research institutions to promote all aspects of CCS.	Private sector, research institutions	Short-term
<b>International, regional cooperation</b>	C2.0	International and regional cooperation will be vital for CCS deployment in Slovenia (and the region).	Government, private sector	Mid-term
	C2.1	To launch cross-border projects that would benefit countries and connect capture, transport, and storage, formation of industrial clusters should be actively supported by the government. The focus should be on developing transport infrastructure with neighbouring Italy and Croatia. Synergies with developing hydrogen infrastructure should be sought.	Government, private sector	Mid-term
	C2.2	Bilateral agreements or memorandums of understanding signed by participating countries could serve as the basis for the development of a stable framework for cross-border cooperation: standards, funding and incentives, risk sharing, and business models.	Government, private sector	Short-term

	C2.3	While Slovenia is a signatory of the London Protocol, it has yet to ratify the Article 6 amendment, which allows for cross-border transport of CO <sub>2</sub> in the marine environment. The Government should thus ratify Article 6 amendment and in the meantime (until amendment reaches required majority of 2/3 signatories to come into effect), sign a bilateral agreement with the country of destination (i.e. Italy) of the CO <sub>2</sub> exported from Slovenia (in cases of off-shore storage).		
<b>Stakeholder cooperation towards CO<sub>2</sub> market</b>	C3.1	Government must take the lead in bridging stakeholders' plans and encouraging CCS rather than CCU.	Government	Mid-term
	C3.2	Iron and steel sector (Slovenian Steel Group, Štore Steel), cement industry (Salonit Anhovo), power generation sector (Termoelektrarna Šoštanj, Energetika Ljubljana), limestone industry (IGM Zagorje) and paper industry (Vipap Videm) must work together (as suppliers and users of CO <sub>2</sub> ) to develop a common CO <sub>2</sub> markets and infrastructure.	Private sector, public sector	Mid-term
	C3.3	A national CCS strategy, including a feasibility study should be developed. Government should send a strong signal to industrial actors as well as private investors that it intends to actively fund (from the Climate Fund) such projects.	Government, private sector	Short-term



## D) Social aspects and public support

Key action	Number	Approach	Stakeholders	Timeline
<b>Building public support</b>	D1.1	An in-depth assessment of climate and CCS awareness and of perceived risks should be conducted; by the Ministry of Climate Change and Energy or by research institutions (to be funded by the Climate Fund).	Ministry of Climate Change and Energy, private sector, research institutions	Short-term
	D1.2	Energy intensive industries, in particular Saloniť Anhovo, should start engagement campaigns to promote CCS and their CO <sub>2</sub> capture pilot project.	Private sector	Short-term
<b>Building awareness</b>	D2.1	To increase the level of public and institutional awareness of climate change mitigation measures, including on CCS, to both the engagement of trained facilitators (e.g. independent journalists, leading scientists, celebrity speakers) – a coordinated national campaign should be considered.	Government, private sector, research institutions, NGOs	Short-term
	D2.2	A specific CCS presentation could be made at the State Assembly, or individual parliamentary groups, which would put the technology “on the map”.	Government, parliament	Short-term
<b>Improving fairness of the decision-making process</b>	D3.1	In order to provide fairness in decision-making, the potentially affected communities (however defined; by area, profession, age, etc.) should be involved already at the conception stages of pilot and demonstration projects.	Municipalities, private sector, NGOs	Mid-term
	D3.2	Community compensation should be considered where CCS projects are to be developed.	Municipalities, private sector	Short-term
<b>Communication of costs, risks</b>	D4.1	Full transparency and early public engagement is vital with upcoming CCS projects.	Private sector, civil society, municipalities	Mid-term

<b>and benefits of CCUS projects</b>	D4.2	Communication of costs, benefits and risks should thus be communicated clearly and accurately. Preferably via structured debates/round-tables, as well as targeted communication campaigns.	Private sector, civil society, municipalities, academic and research institution	Short-term
<b>Making sure the CCS project fits within the local context</b>	D5.1	A detailed analysis should be performed in order to evaluate individual local communities based on their overall appropriateness for implementation of CCS/CCU technologies and gain insight into public perception.	Private sector, academic and research institutions, municipalities	Short-term
<b>Building trust in decision-makers and other relevant stakeholders</b>	D6.1	Industry stakeholders and governments tend to score lower on trustworthiness in a CCS context, while researchers and NGOs are seen as more trustworthy. Project developers should partner with consulting companies, NGOs and local communities when communicating with the public this could help build trust in the technology and policy.	Ministerial cooperation, private sector, universities, NGOs, civil societies	Mid-term

## Chapter 4. Next and immediate steps

Slovenia has indicated that it is ambitious in terms of its climate goals, having included a goal of carbon neutrality by 2050, and getting off coal as an energy source by 2033. Nevertheless, there are several general barriers that are preventing development of both renewable energy sources, as well as other technologies such as CCS. These relate primarily to long administrative procedures and relatively unstable government cycles. Slovenia also has a lack of awareness and understanding regarding CC(U)S, among all types of stakeholders, in particular among policy-makers. Furthermore, other barriers for deploying CC(U)S in Slovenia include lack of availability of funding for initial pilot and demonstration projects, as well as societal and NGO opposition, and no clear governmental support or strategy for deployment in national policy and legislative documents.

While some steps have been identified as mid- to long-term steps to be taken, there are five key steps that must be taken in the short-term so as to not delay development and deployment further:

- i) Increase awareness among policy-makers, NGO's, and political representatives, as well as general public
- ii) Establish a CCS advocacy group (within the Chamber of Commerce or as a standalone)
- iii) Provide a clear political signal that CCS has a role to play in the decarbonisation of the energy intensive industries in Slovenia (i.e. develop a national CCS strategy and increase visibility in NECP)
- iv) Increase funding in the Climate Fund for technological innovations, development and demonstration of low carbon technologies, including for measures that would support development of feasibility studies (for CO<sub>2</sub> capture, and transport and storage options).
- v) Increase engagement with international fora.

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