

Agreement on Strengthened Framework Conditions for CCS in Denmark

Climate Action - The Path to Full Carbon Capture and Storage in 2030

20 September 2023

Agreement between

The Danish government (The Social Democrats, Venstre - the Liberal Party of Denmark and The Moderates), Green Left, Liberal Alliance, The Conservative People's Party, The Red-Green Alliance, The Danish Social Liberal Party, Danish People's Party, and The Alternative.

Carbon Capture and Storage (CCS) is a vitally important tool for meeting climate goals: globally, with the Paris Agreement, more regionally, with EU targets, and at home, with Denmark's 70% reduction target by 2030. Specifically, CCS can contribute to the reduction of CO₂ emissions from waste facilities, combined heat and power plants, and heavy industry. CO₂ can also be removed from the carbon cycle if it is captured and stored from biogas plants, for example, and biogenic sources in the utilities sector. Therefore, CCS can also contribute to the government's goal of 110% reduction by 2050 compared with the 1990 level. CCS cannot and should not stand alone. We must carry on using energy efficiently, and continue the expansion of renewable energy and green solutions, but in selected sectors it is either currently not possible or still too expensive to reduce all emissions. This is where CCS technology is necessary.

According to the Intergovernmental Panel on Climate Change (IPCC) scenarios, 730 billion tons of CO₂ will need to be stored globally by 2100 to meet the Paris Agreement targets. CCS must therefore be geared up to facilitate this. Denmark is well placed to exploit a large potential for CO₂ storage. GEUS estimates that Denmark's subsoil has room for a total of 12-22 billion tons of CO₂, which is equal to up to 500 years of emissions from Denmark. Thus, there is room for both Danish and foreign captured CO₂, and it has the potential to create jobs and become a good business opportunity for Danish society. A rapid development of the CCS market can lead to both large investments and more green jobs in Denmark.

CCS needs to increase in scale and decrease in price, and this will require major development in the coming years, which this agreement will help to achieve. Investments must be made in developing the entire value chain from capture to storage or use of CO₂, the infrastructure for transporting CO₂ must be rolled out, and a clear framework is needed for state participation in CO₂ storage. This is happening now. The parties to this agreement seek to strengthen the framework conditions for CCS in Denmark, provide the industry and the energy sector with a much clearer investment framework, and make it more of a certainty that the estimated reductions from CCS will be realised.

Developments since 2020

Since 2020, a number of political agreements have been made to ensure a market-based roll-out of CCS, including the overall CCS strategy. As a result of these political agreements, approximately DKK 38 billion has been allocated to CCS, which is estimated to lead to reductions totalling 3.2 million tons of CO₂ by 2030. In addition, the Danish Parliament has passed a number of bills that create a legal basis for the market development.

2023 is therefore already a historic year in Denmark for CCS. In March, the first CO₂ was stored in the North Sea, and in May, Ørsted won the tender for the first phase of the CCUS pool of around DKK 8 billion to establish the first full-scale CCS project in Denmark. In addition, in 2022, Denmark signed a cross-border CO₂ transportation agreement with Belgium for geological storage under the seabed.

With the political agreements, ambitious investments and plans from market players in connection with the first support pools and tenders for storage licences, Denmark has taken the first important steps towards establishing a complete value chain for CCS. At the same time, the sector is already evolving rapidly.

Barriers to CCS market development towards 2030

Input from the industry, CCS cluster recommendations and the Danish Council on Climate Change have shown that four barriers in particular need to be addressed to support investment in CCS as we approach 2030. This agreement follows three main tracks that focus on the Danish framework and one main track that focuses on European and international efforts:

- Implementation of the CCS pools
- Ownership and regulation of CO₂ transportation via pipelines
- State co-ownership of CO₂ storage permits and storage framework
- International framework

In addition to this agreement, long-term framework conditions must be defined for CO₂ capture in the utilities sector. The government has expedited its efforts on this matter, and expects to discuss a proposal with the parties in the Danish Parliament before the end of the year.

The parties to the agreement want to show a more secure path to the expected reductions of 3.2 million tons of CO₂ by 2030, strengthen the framework to enable the roll-out of CCS in Denmark to become market-based in the long term, and make Denmark a European hub for CO₂ storage. The parties to the agreement note that Denmark is on the threshold of a breakthrough for a very important climate instrument, and potentially Denmark's next green business adventure.

Implementation of CCS pools

The ambition is that CCS will eventually be rolled out on market terms, where increased private economic incentives via taxes, for example, and quotas for CO₂ from fossil sources and, possibly, sales of certificates for climate credits from biogenic sources will become the main economic incentives in the market. The parties to the agreement note, however, that the capture and storage of CO₂ is expected to remain dependent on government support in the coming years.

The *Climate Agreement for Energy and Industry (2020)* and *Agreement on Green Tax Reform for Industry (2022)* have enabled two pools to be established to facilitate carbon capture and storage: the CCUS and GSR pools. The first phase of the CCUS pool was determined in May 2023. The second phase of the CCUS pool, together with the GSR pool, support CCS by providing approximately DKK 27 billion, and are estimated to reduce emissions by 2.3 million tons of CO₂ by 2030. The parties note that both pools are subject to agreement.

The parties to the agreement want to ensure that the support conditions are made clear to market players, and will also help to make CCS tenders relevant for larger point sources and regional clusters. It will also increase competition for pool funds. In this connection, the parties agree on the following:

- The second phase of the CCUS pool will be merged with the GSR pool to make a single CCS pool, which will be implemented through two tender rounds.
- The tenders will be worth approximately DKK 10.5 billion and DKK 16.3 billion, respectively, over a 15-year period. This is expected to result in annual reductions of 0.9 and 1.4 million tons of CO₂, respectively. Thus the overall pool will ensure that 2.3 million tons of CO₂ are

captured and stored annually from 2029 and the subsequent 15 years. A total of 3.2 million tons of CO₂ a year will be stored from 2029.

- Contracts may be signed with multiple actors, and beneficiaries can be individual actors from the entire CCS value chain, consortia or a third party who will be responsible for the entire value chain
- The first tender will be published in June 2024, and the second tender in June 2025.
- Subsidies are granted per ton of CO₂ captured and stored.
- The tender is designed on the basis of experience from the first pools, to ensure as much competition for the funds as possible and thus the greatest possible reductions. The tenders, like the first CCUS tender, will have some flexibility for opt-out after 2030, which will allow the contract holder to withdraw from the contract if, for example, they see a better business case in selling CO₂ for use. The exit option is designed to enable the expected reductions for the 2030 target to be delivered, and the funds to be re-tendered, in order for the pool to continue delivering the agreed reductions until the pool expires.
- Funds will be available for capture and storage from 2028, with full capture and storage required from 1 January 2029. This is expected to give market players sufficient time to commission the value chain while contributing to Denmark's 2030 climate targets.
- The funds are re-accrued to support the new overall pool profile. This means, cf. Appendix 2, that the CCUS pool funds that come after 2044 (DKK 1.4 billion) will be distributed over the years before 2044. Similarly, the funds in 2026 and 2027 (DKK 0.7 billion) will be distributed over the years, and approximately DKK 0.6 billion will be moved to 2028
- The CCS pool supports the capture, transportation and storage of CO₂ (CCS) that contributes to the achievement of Denmark's climate goals.

The parties to the agreement note that the implementation of the total CCS pool is subject to state aid approval from the European Commission.

Ownership and regulation of CO₂ transportation via pipelines

It is important for the development of an overall value chain for the capture and storage of CO₂ in Denmark that there is a clear framework for transporting CO₂. With this agreement, the parties wish to follow up on the demand from the industry for a clear framework for transporting CO₂ via pipelines. There is currently regulation for transporting CO₂ via pipelines directly from capture to permanent storage, but a clear framework is lacking for the transportation of CO₂ via pipelines for utilisation (CCU), for example, or to a port for storage in the North Sea. This follows up on the recommendations made by the six CCS clusters in early 2023. The CCS Clusters were established in the second part of the CCS strategy to provide recommendations on the local transportation of CO₂.

To support the development of a pipeline transportation infrastructure for CCS on market-based terms, where market demand drives the development of the pipeline infrastructure, the parties agree that:

- A new main law for the transportation of CO₂ is prepared. This is expected to be submitted for consultation at the end of 2023, and presented to the Danish Parliament in early 2024. The law will ensure a clear and uniform framework for pipeline transportation of CO₂, regardless of where and for what purpose the CO₂ is transported in Denmark.
- The Danish Energy Agency's existing authorisation under the Subsoil Act to set requirements for the dimensioning of CO₂ pipelines when approving projects will be transferred to

the new main law. The aim here is to support future-proof dimensioning of the pipeline infrastructure.

- Both private and state-owned companies must be able to own, establish and operate CO₂ transportation infrastructure. The aim is to support a market-based development of CCS and not slow down existing and future CCS projects.
- The Danish Utility Regulator is authorised to regulate third party access to CO₂ transportation pipelines. This is to ensure that no actor can unlawfully prevent other actors from using a pipeline, but that all parties wishing to use a pipeline to transport CO₂ are able to do so as far as possible.
- In 2024, the government will present a proposal for the framework for cross-border infrastructure and the interconnection of regional transport networks for the transportation of CO₂. The proposal will support Denmark's political ambition to be a European hub for CO₂ storage, and to contribute to achievement of the climate target by 2030 through CO₂ capture and storage, cf. Climate Projections. Therefore, no decision is made in this agreement on ownership and regulation of cross-border and regional pipeline infrastructure.

The new main law on CO₂ transportation shall ensure third-party access to all CO₂ pipelines, so that the infrastructure owner does not take advantage of an unreasonable monopoly-like position, as well as clear rules on expropriation when the CO₂ pipelines are established. A market-based ownership model fulfils the political ambition in the CCS strategy that CCS should be developed on market-based terms.

The parties to the agreement note that, when the tendering for an overall CCS pool ends, they will be presented with a status report on the development of the pipeline infrastructure, including whether the plans for the establishment of CO₂ pipelines meet expectations, with a view to discussing whether further measures are needed.

The parties also note that the European Commission plans to present a proposal for an *Industrial Carbon Management Strategy*, expected in early 2024. The strategy is expected to address regulatory needs and frameworks for CO₂ transport infrastructure. Based on the European Commission's strategy, the parties will be presented with a proposal for a possible framework for cross-border pipeline transportation and interconnection of regional transport networks by the end of 2024.

The parties to the agreement note that waste and utility companies owned by the municipalities shall have explicit authority in the relevant sector regulation if they are to engage in activities such as ownership of pipeline infrastructure. Work has been initiated on proposed decision-making on the long-term framework conditions for CO₂ capture in the utility sector, including for municipality-owned utility companies. The results of the work will be discussed on a political level before the end of 2023, with the purpose of supporting, among other things, equal competition between municipality-owned and private companies in connection with tendering for the CCS pool.

The parties note that this agreement does not change the agreement made earlier in the *Roadmap for Carbon Capture, Transport and Storage* of December 2021 that a model for CO₂ capture at waste incineration and biomass plants shall help to ensure that the costs of CCS plants are not passed on to heating and waste consumers.

Future state participation in carbon storage licensing

The parties to the agreement agree to open a tender for onshore and coastal sites before the end of 2023, subject to the Danish Energy Agency's ongoing strategic environmental assessment of eight coastal and onshore sites, see *Appendix 1*. The parties' general focus is on the safety of CO₂ storage, and they note that an impending tender for onshore carbon storage licensing can only be opened if the Danish Energy Agency assesses that it is safe and environmentally sound. The Climate, Energy and Utilities Committee will be presented with a report on the licensing round before it is initiated.

The parties agree on the importance of taking safety and working environment considerations into account in connection with storage both on land and at sea. The parties have therefore agreed to consolidate the ongoing regulatory coordination by forming a regulatory group, which aims to continue to support safety and working environment considerations in connection with future carbon storage projects, including regulation of the area and supervision of the projects by the authorities.

The parties are open to new storage options and technologies that can support the safe and environmentally sound storage of CO₂.

Nordsøfonden's co-ownership

It was agreed in the *Framework Conditions for Carbon Storage in Denmark* of 21 June 2022 that Nordsøfonden's participation in carbon storage licensing, together with ordinary taxation, would be the state's primary method of securing a surplus from CO₂ storage in the subsoil. In February 2023, the Danish Energy Agency granted the first three permits for full-scale carbon storage projects in the North Sea. It was decided in the agreement that Nordsøfonden would contribute 20% in each of the three storage licences issued. The parties agree that future carbon storage licensing rounds will be held under the following framework:

- The state's ownership stake in storage licensing via Nordsøfonden will also be set at 20% in the future. To ensure transparency and clarity for licensing applicants, Nordsøfonden's ownership stake will be specified in the relevant tender material.
- The state's rights are agreed in a partnership agreement for the individual licence, between Nordsøfonden and the given entities, as is familiar from the oil and gas sector.

The parties note that exploration and storage licenses stipulate that social conditions similar to those that apply to the first tender for the CCUS pool, for example, must be met.

If a party wishes to change the state's co-ownership stake in future carbon storage licences, this will be discussed by the parties to the agreement.

To date, Denmark has allocated approximately DKK 200 million to geological surveys of the Danish subsoil for the purpose of onshore and coastal carbon storage. The surveys have been carried out by GEUS, which makes the results of the studies regularly available free of charge in order to support the development of a market for carbon storage in Denmark. With an upcoming tender for storage licensing in these zones, Denmark can now reap the benefits of this investment. The parties to the agreement therefore agree that:

- In future licensing rounds, licensees will be required to make a payment to the state for an issued storage licence to cover the state's costs associated with the qualification of the specific storage site.
- The amount is only payable if a storage licence is applied for after the exploration phase (subject to the proviso that deferring payment does not constitute unlawful state aid).

Gas Storage Denmark

The *Framework Conditions for Carbon Storage in Denmark* of 21 June 2022 gave Gas Storage Denmark (GSD) the opportunity to start working on the pilot project for CO₂ storage at Stenlille. Gas Storage Denmark has estimated, in collaboration with GEUS, that the pilot project has the technical potential to store CO₂ for up to 20 years, instead of the five years it was originally thought possible. This enables the storage of up to 7.5 million tons of CO₂ more than expected, and makes the project more cost-effective. The industry is also showing an interest in working with Gas Storage Denmark to mature other onshore storage facilities through continued dialogue and studies for possible future partnerships. The parties to the agreement agree that:

- Gas Storage Denmark cannot be included in other storage licences than the one that applies to Stenlille, as the state's co-ownership is handled by Nordsøfonden.
- Gas Storage Denmark can provide technical assistance and operations to other operators on market terms in compliance with state aid rules.

International framework

To ensure a clear framework for CCS in Denmark, it is crucial that not only Danish but also international CCS regulation is in place. A lack of clarification at EU level could lead to an unclear framework for investments in CCS projects in Denmark. It is therefore important to continue to promote Danish interests in the development of regulatory frameworks in the EU and internationally. This must also be done through continued cooperation with like-minded countries that want to support the development of CCS internationally and within the EU. Finally, this is ensured by supporting Danish actors in securing EU funds from, among others, the EU Innovation Fund, an initiative for which funds have been allocated in the *Finance Act for 2023*. The parties to the agreement therefore agree that:

- Efforts continue to promote Danish interests in the EU's work on the framework for the CCS area and on negative emissions in the EU's quota system, cf. *A Roadmap for the Capture, Transport and Storage of Carbon (Second Part of an Overall CCS Strategy)* of December 2021.
- Work continues on the CCS Strategy's target of entering into more partnership agreements with like-minded countries, and the parties to the agreement urge the government to enter into more international agreements on the transportation of CO₂. Special priority is given to working with countries that, like Denmark, want to use CCS as a means to reduce those CO₂ emissions that are hard to reduce and remove CO₂ from the carbon cycle, such as Germany, Norway, the Netherlands, Sweden and France, to support the development of CCS in Denmark and the rest of Europe.
- A strategic initiative will be launched to support the repatriation of EU funding for CCS projects, amongst others, cf. *the Finance Act for 2023*.
- Denmark's position on cross-border pipeline transportation and interconnection of regional transport networks will be made known when the European Commission presents its *Industrial Carbon Management Strategy* - expected in 2024.

A Danish Storage Forum has been established, which is tasked with providing input to the prioritisation of the work on international cooperation agreements and the work on defining cross-border transportation. Among other things, the forum will provide input to the government's proposal on the infrastructure for cross-border and regional transportation of CO₂, which will be discussed with the parties to the agreement before the end of 2024.

The nature of the agreement

The agreement has the character of a voting agreement in which the parties undertake to vote in favour of the proposed laws and licensing powers that make up the content of the agreement. The government will regularly inform the parties to the agreement of significant developments and implementation in the area. No new settlement obligations are established with the agreement. The parties note that the agreement follows up on the two sub-agreements on the strategy for carbon capture and storage and the agreement on framework conditions for the storage of CO₂ in Denmark.

The CCS pool is covered by settlements through the *Climate Agreement for Energy and Industry etc.* of June 2020 (S, V, DF, RV, SF, EL, K, LA and ALT) and the *Agreement on Green Tax Reform for Industry etc.* of June 2022 (S, V, SF, RV and K).

Appendix 1: Overview of Possible Future Areas of Tender



*Subject to the outcome of the ongoing strategic environmental assessment of the named coastal and on-shore areas.

Appendix 2: Overview of Pool Profiles for New CCS Pool

Table 1

Pool profile in the event of aggregation and change in pool profile, compared to previous CCS pools

	2026	2027	2028	2029	2030- 2040 (annually)	2041	2042	2043	2044	2045	2046	2047	2048	2049	Total
DKK million. (2023-PL)															
1st tender	0	0	670	683	683	614	534	497	0	0	0	0	0	0	10,509
2nd tender	0	0	475	1,025	1,025	1,025	907	820	817	0	0	0	0	0	16,348
Total	0	0	1,145	1,707	1,708	1,639	1,441	1,317	817	0	0	0	0	0	26,856
Marginal economic change per year	-161	-553	587	23	24	132	305	187	613	-313	-308	-308	-266	-203	0

Notes: The funds are calculated in DKK million. (2023-pl) for the two tenders in the new CCS pool. The funds for the CCS pool are based on the second phase of the CCUS pool and the GSR pool, and include administrative costs and any derived tax loss. The accumulated effects are subject to great uncertainty, and the final CO₂ reduction effects will be determined by the final offers in the tenders.

Source: Danish Ministry of Climate, Energy and Utilities