Ten points to be taken into account as part of the national carbon management strategy

March 2023

During a workshop in November 2022, the undersigned companies identified hurdles in the existing legal regulations and market conditions in the processes for the use and storage of captured CO_2 (CCU/S), which are essential for the implementation of CCU/S at the required speed and the necessary scale in Germany. The participants discussed possible solutions and summarized them in the form of ten action points in this paper. The implementation is of great importance for the preservation of Germany as an industrial giant and a condition for meeting the climate targets set by both Germany and the European Union.

Ten points for an efficient national carbon management strategy

1. **CCU and CCS are equal paths to climate neutrality and complement the expansion of renewable energies.**
2. **A National Carbon Management Strategy (CMS) is trend-setting and must be linked to the National Hydrogen Strategy and the National Biomass Strategy.**
3. **CO_2 Infrastructure is an essential part of an integrated Climate Neutrality Network.**
4. **The rapid construction of a CO_2 Pipeline Network is required for scaling.**
5. **Certification of CO_2 is crucial for reliability and business cases along the CO_2 Value chain.**
6. **CCU technologies need full recognition in the EU Emissions Trading System (ETS).**
7. **Opportunities should be opened up for CCS outside the EU and EEA.**
8. **The requirements of the London Protocol on offshore CCS must be met as quickly as possible.**
9. **New infrastructure requires consistent adaptation and acceleration of approvals.**
10. **CCU/S must be recognized as breakthrough technologies for climate protection and must be the focus of government funding programmes.**

1. CCU and CCS are equal paths to climate neutrality and complement the expansion of renewable energies.

In the public debate, CCU/S technologies are subject to different perceptions, whereby CCU often has more positive connotations than CCS. Here, the Carbon Management Strategy (CMS) announced for mid-2023 must make it clear that both CCU and CCS are necessary to achieve climate neutrality and that a holistic, overall balance sheet view is required. The fields of application of CCU/S are diverse and primarily address the sectors in which climate protection measures reach their limits through direct electrification, more efficient or converted production processes, e.g., in the basic industries with process emissions or in air and maritime transport. CCU/S is an integral part of sustainable value chains, as CCU turns CO_2 previously a waste product into a raw material, or the combination of CCS with the use of sustainable biomass (BECCS) facilitates reaching negative emissions. Both processes require green electricity, CCU for the provision of renewable hydrogen and the subsequent synthesis process, CCS for the compression and/or liquefaction of the captured CO_2. In combination with the parallel and accelerated expansion of renewable energies, CCU/S can develop its full potential.

2. **A National Carbon Management Strategy (CMS) is trendsetting and must be linked to the National Hydrogen Strategy and the National Biomass Strategy.**

   In October 2021, the state of North Rhine-Westphalia formulated its ideas on the future importance of CCU/S processes and the need for a pipeline-bound CO_2 infrastructure in a CMS. However, this document is currently the only one of its kind in Germany. As such, a strategy will guide future investment decisions. We welcome and support the intention of the Federal Ministry for Economic Affairs and Climate Protection (BMWK) to create a national German CMS by mid-2023. The work on this, accompanied by a stakeholder process, must begin as planned at short notice and should build on the results of the NRW document in order to use the extensive preparatory work carried out there to ensure a rapid completion.

   The principle must not be to eliminate carbon from the system, but to avoid emitting additional CO_2 into the atmosphere and to reduce the existing CO_2 concentration in the atmosphere in the long term through active technical management. Carbon is an indispensable component of value chains, e.g. in the chemical industry, and can also serve as a recyclable carrier for the efficient transport of hydrogen. A CMS is thus inherently linked to the National Hydrogen Strategy. In combination with CCS, for example, the provision of high-temperature process heat becomes climate-neutral in itself and, in conjunction with BECCS, makes it possible to compensate for the 5 million tonnes of unavoidable residual emissions of industry mentioned in the coalition agreement in order to achieve climate neutrality for society as a whole. However, this also results in a direct link with the National Biomass Strategy announced at the end of September 2022 by the three federal ministries: BMWK, BMEL and BMUV. The revision of the National Hydrogen Strategy and the preparation of the Carbon Management and Biomass Strategy must therefore be guided by the principle of mutually supportive objectives.

3. **CO_2 infrastructure is an essential part of an integrated climate neutrality network.**

   In addition to electricity, methane and hydrogen infrastructure, the CO_2 networks will make an important contribution to achieving climate targets. What is needed is a constructive dialogue with all stakeholders that accompanies and promotes the rapid establishment of a CO_2 value chain. The dialogue must start immediately, as the infrastructure is already on a critical path. This must take into account the rapid development and comprehensive planning of a grid- and ship-bound CO_2 infrastructure in Norway and the neighbouring countries of Denmark and Belgium.

   Investments in the decarbonisation of industry require long-term planning security and infrastructural location commitments. Therefore, the target view of Germany's climate neutrality in 2045 should be assumed. Nevertheless, investments must be made today. Transit volumes from neighbouring countries must also be taken into account, especially with regard to a future CO_2 network, in order to avoid future cost-intensive grid reinforcements. At the same time, this cross-border approach makes it possible to reduce network charges for all network users, including those domestically, due to the higher volume transported.

4. **The rapid construction of a CO_2 pipeline network is required for scaling.**

   The EU Commission has recognised the important role of a CO_2 economy and updated its TEN-E Regulation to specify the infrastructure class of CO_2 pipelines to be promoted at a European level. The German Carbon Dioxide Storage Act (KSpG) currently links CO_2 pipelines with storage demonstration projects approved by the end of 2016. The extent to which CO_2 pipeline networks can be considered separately from storage projects is subject to a controversial legal assessment. The European legal situation was clarified with the introduction of the revised TEN-E Regulation which came into force in 2022. This allows the development of commercial CO_2 pipelines without the need for a direct connection to a storage project. An amendment of the KSpG is therefore also required in the short term, which also reflects this change in national law. In principle, the future legal regulations regarding a pipeline-bound CO_2 infrastructure

should be based on the legal framework in the natural gas sector, which has been tried and tested for decades, and adopt it as much as possible to simplify implementation for all parties involved.

Until the expansion of a pipeline network has taken place and also, depending on regional availability, additional transport modalities by truck, ship or train will be necessary. In the short term, therefore, multimodal transport should be permitted by amending the European and national legal framework. In accordance with the Monitoring Regulation, the responsibility for leaks within the CO_2 transport chain must also be extended to all modes of transport, where a consistent tracking system is required. The EU Taxonomy Regulation currently stipulates a maximum loss rate of 0.5% between source and location for the transport of CO_2, which can be technically challenging for multimodal transport. Equivalent measures in terms of climate impact, such as additional capture to compensate for small losses, should also be recognised.

5. **Certification of CO_2 is crucial for reliability and business cases along the CO_2 value chain.**

A guarantee of origin systems already exists for electricity and biogas, which are to be expanded with the current draft law of the Federal Government to include guarantees of origin for gas, hydrogen, heating or cooling from renewable energies. Such a system of guarantees of origin is also required for CO_2, which can originate in industrial sources from fossil or biogenic energy sources and raw materials as well as mineral precursors or from the atmosphere. This detection enables the generation of negative emission certificates with regard to biogenic and atmospheric CO_2 with permanent storage. This is also important for CCU processes in order to be able to classify a carbon-containing synthesis product with regard to its sustainability properties. The required certification system must go beyond the EU Commission's draft "Certification Framework for Carbon Removals" published in November 2022 and include, not only the voluntary CO_2 market, but also the compliance market, with a stronger focus on industrial processes and the associated opportunities. The Federal Government should work at an EU level to ensure that certification rules are drawn up in a timely manner.

Accounting for the use of different types of CO_2 also enables CCU projects to continue operating beyond 2045 and thus contributes to the decarbonisation of aviation and maritime transport, among other things. This approach allows the combination of CCU and CCS at one site and enables the transition from CCU with fossil CO_2 to CCU with biogenic CO_2. Book-and-claim models can support the market ramp-up where physical transport of the corresponding CO_2 would be economically and environmentally inefficient, with effective mechanisms excluding multiple counts and guaranteeing tradability. A guarantee of origin system must be designed efficiently so that bureaucracy is minimised and certification avoids an increase in the cost of a CCU product.

6. **CCU technologies need full recognition in the EU ETS.**

According to the outcome document of the trilogue negotiations on the revision of the ETS Directive, it is envisaged that CO_2 permanently bound in a product and not released under normal use, including all normal activities, after the end of the product's life, does not have to be supplied (Art. 12 (3b)), whereby in the broadest sense the disposal, the reuse, reprocessing, recycling, incineration and landfilling (recital 13). With the exception of delegated acts specifying the requirements for permanent binding, there is now legal certainty.

However, the situation is different if CO_2 is not permanently binding. Here, the EU Commission is not to submit a report until 31 July 2026 and initially only a report assessing the crediting of these GHG emissions (Art. 30(4a) point (c) and recital 59c). This report will be accompanied, if necessary, by an appropriate legislative proposal. An uncertainty of the regulatory assessment over more than three years with regard to CCU products with non-permanent CO_2 sequestration will significantly hinder essential projects for the energy transition. The Federal Government

should work towards the timely submission of a proposal to the EU Commission regarding a corresponding downstream legal act.

7. **Opportunities should be opened up for CCS outside the EU and EEA.**

   The CCS Directive currently stipulates that CO_2 must be stored in a member state of the European Union, so that no EU EUAs have to be surrendered for the stored amount of CO_2. A legal opinion given by the EU Commission in September 2022 confirms that this storage option can also be extended to EFTA states and thus applies throughout the EEA territory, whereby supplementary intergovernmental treaties may be required. Even though this can cover the European projects currently under development and the evaluation report of the Federal Government on the Carbon Dioxide Storage Act below the North Sea (including the Norwegian Sea and Barents Sea) shows a CCS potential of between 150 and 190 Gt CO_2, the CCS Directive is valid for a worldwide Storage of CO_2 can be opened. Europe will thus have the opportunity to diversify its storage locations regionally and also to make use of more easily accessible onshore sequestration facilities if the recipient countries wish to develop such storage sites. Transport and storage must be as energy- and resource-efficient as possible. If standards at least equivalent to European standards are met, such storage should comply with the requirements of the EU ETS Directive and the obligation to surrender EU EUAs should then be eliminated or another equivalent monetary incentive created.

8. **The requirements of the London Protocol on offshore CCS must be met as quickly as possible.**

   The London Protocol of 1996 prohibits the dumping of waste for the purpose of its disposal at sea. In 2007, an amendment exempted CO_2 streams from carbon capture processes for the purpose of geological storage. However, Article 6 still prohibited the transboundary transport of CO_2 for permanent geological storage under the seabed. Although an amendment to this article adopted in 2009 enabled the geological offshore storage of CO_2 in principle, this regulation has not yet come into force due to a lack of ratification by a 2/3 majority of the contracting parties. Since only six of the 53 Contracting Parties had ratified the amendment to Article 6 by 2022, it is not expected that the amended Article will come into force in the foreseeable future. Since 2019, however, it has been possible to declare the provisional application of the amended Article 6 and thus enable the transboundary shipment of CO_2 for permanent storage offshore.

   With regard to the offshore CCS projects announced or already put in operation,, in particular in Norway, Denmark, the UK and the Netherlands, and their opening up to CO_2 from other emitter countries, the Federal Government must give provisional recognition to the amendment of Art. 6 in the short term, so that regulatory planning certainty exists during project development and bilateral contracts on offshore CCS can be concluded with international partners where necessary. Even if ratification of the amendment to Art. 6 will likely have no immediate effect, this should also take place at the same time in order to make a clear commitment to the international partners.

9. **Novel infrastructure requires consistent adaptation and acceleration of approvals.**

   Approval law and procedures threaten to become the highly problematic bottleneck of the energy transition and industrial transformation. The announced federal-state pact to accelerate planning and approval procedures was postponed for the second time in December 2022. It is important to leverage all acceleration potentials. Installations for CO_2 capture require approval according to BImSchG and, depending on the size, process used, and substances used, are subject to the limit values or classifications and the associated requirements of the respective BImSchV and the TA Luft. Depending on the process used, the concentration of the remaining components in the clean gas can increase due to a significant volume reduction of the exhaust gas. This applies in particular to pre-capture manufacturing processes, such as oxyfuel technology, which have been converted to increase efficiency by concentrating the CO_2 content. However, since the pollutant loads emitted remain the same from a product-specific point of

view, disadvantages under licensing law for these plants must be avoided. The legislator should therefore provide for the volume of CO_2 removed after the process or nitrogen separated before the process to be further taken into account when calculating the volume fractions of other emitted substances or to be covered by equivalent product-related emission factors or freight-related limit values. Introducing double measurements should also be avoided. As a general rule, CO_2 capture facilities from existing processes should be classified as ancillary installations to the existing plant. Only if the CO_2 capture plant has an independent operator should a separate new permit be required in accordance with No. 10.4 of the 4th BImSchV (in the case of capture for the purpose of geological storage) or under building law (for other purposes for the captured CO_2).

In order to ensure a time-efficient permitting process, projects for the capture, transport and storage of CO_2 are to be classified as projects of outstanding public interest, similar to LNG terminals and renewable energy generation plants. This is to ensure that the approval procedures for these projects are carried out by all authorities with the highest priority and the necessary human resources. In addition to this categorisation, it is also necessary to harmonise the approval landscape between the federal states and concentrate on individual approval authorities that focus on such projects.

10. **CCU/S as breakthrough technologies for climate protection must be the focus of government funding programmes.**

The "Decarbonisation in Industry" funding programme is currently available to promote CCU's investment. It is important that CCS projects can also be supported swiftly. We therefore welcome the current revision of the funding programme, which provides for a module for CCU and CCS in the future, which should take into account the structure of the entire value chain. In addition, Carbon Contracts for Difference (CCfD), which have already been launched with the draft of a funding guideline of the BMWK, can be used for OpEx (and CapEx) extraction in the future. Since OpEx support is also crucial for the realisation of many projects, this instrument should be strengthened in terms of financial resources and the actual CO_2 reduction performance should be promoted compared to the plant to be replaced or supplemented. Due to the nature of the instrument, CCfD's funding is uncertain, which may necessitate an adaptation of EU state aid rules.

Since investment decisions depend on overall profitability and CapEx and OpEx have different weights depending on the project, CapEx and OpEx funding instruments must be conceptually well interlinked. It must be ensured that support for mutually dependent projects such as capture, transport and storage, both along a value chain and across value chains between different sectors, such as CO_2 extraction in the lime or cement industry and its use in the chemical industry, leads to simultaneous decisions. This is what we are talking about. This is the only way to make these joint projects, which are important for decarbonisation and where the final emission reduction does not take place in the company's own part of the project possible.

In addition to direct support for individual projects, consideration should also be given to the possibility of supporting infrastructures such as terminals for loading onto seagoing vessels or pipeline systems to avoid prohibitively high network charges (for First-M over). Stimulating climate-neutral or climate-negative markets through the creation of lead markets through public procurement is another important and market-oriented pillar to support the ramp-up of CCU/S technologies.