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Is there a future for CCUS in Europe? An analysis of the policy framework and societal support

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Abstract

Due to the innovativeness of the technology, the realization of a carbon capture and usage/storage (CCUS) project requires a positive political, legislative and financial supporting framework from policy along with well thought out approaches to foster acceptance and bring local citizens on board. The political willingness to aim for ambitious climate targets is a pre-condition for providing such a surrounding. This includes setting a legislative framework that prescribes decarbonisation and thus allows business models including CCUS to become viable. In addition, legislation regulates the operation of capture, transport and storage sites, a clear framework being highly relevant for operators to know the risks and potential costs related to a project, to know the own responsibilities and responsibilities of others, expectations by the competent authorities and making clear the roles of all participants in the whole project. Although it is to be expected that costs for CCUS activities will fall over time when it moves from being a very innovative first-of-a-kind application to a more mainstream technology, in particular the first-of-a-kind applications require specific support to cover for high costs under high risks. Finally, besides policy support, a number of project developments in the 2000s have shown that securing also wider societal support, i.e. public acceptance, is a key pre-requisite in particular for the realisation of CCUS projects.

In this paper, we analyse the policy framework for CCUS projects in the EU and selected relevant Member States. We examine the interplay of political willingness, legal framework, financial support framework and public acceptance to identify role models but also to point out potential obstacles in the system. Our countries of analysis include the Netherlands and UK as two frontrunners in the process of developing CCUS projects. Both countries have far developed support frameworks. In the Netherlands, the existing climate act already in 2019 enshrined the target of net-zero emissions by 2050 into national law. It is made clear in the accompanying documents that CCS is an important building block for the decarbonisation of industry and an additional national funding mechanism was installed. With the Porthos project in the Port of Rotterdam highly visible implementation activities are also ongoing. Similarly, in the UK as early as 2019 the British Climate Change Committee advised to reach net-zero greenhouse gas emissions by 2050. A ten point plan for a green industrial revolution underlines the role of CCUS for the reaching those targets. It states that four CCUS clusters shall be developed by the end of the decade. A set of financial support mechanisms was and is currently being developed to realize the ambitious targets for CCUS. In our paper, we will go beyond pioneering countries and cover a wider geographical area. Thus, we include further four countries where CCUS is less developed, but may get highly important to reach climate goals in the future due to their economic structure: Poland, a country currently highly dependent on coal, Germany, Spain and France as highly industrialised countries.

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Our analysis shows that on the EU level an important mix of supporting policies and instruments exists. That includes a long-term vision including three net-zero scenarios for the year 2050 that show an important yet differentiated role for CCUS in the different scenarios. The amount of CO₂ captured or reused in the three scenarios lies between 281 and 606 Mt CO₂ in the year 2050. The EU climate law fixes the target for the EU 27 as a group to reach net-zero levels by 2050. With the CCS Directive, the Commission laid down early on corner stones for the capture, transport by pipeline and particular the storage of CO₂ underground. However, it requires additional clarifications and specifications from Member States to fill existing leeway. The CCUS Roadmap to 2030 developed under the CCUS Strategic Energy Technology Plan (SET-Plan) provides interim targets such as 15 commercial industrial and 10 commercial power- or heat-related projects. However, there are no larger financial SET-Plan resources to finance the realization of such interim targets and those targets are not binding to Member States or the EU.

Member States partly profit from the EU-based legislations as well as funding, however, additional national support and clarification of the regulatory framework is necessary for the successful realization of CCUS projects. In our paper, we analyze the political and societal framework conditions in the six selected countries for the development of CCUS projects. We draw on key policy documents to examine a Member State's strategy for CCUS. We further identify the key regulatory framework, in particular a Member State's implementation of the CCS Directive and the distribution of roles in the approval procedures and the operation and closure of transport and storage infrastructure, and analyze the availability and design of additional national financial support instruments. To complete the picture we review evidence on societal support for developing CCUS as well as ongoing activities. This includes building on publications by others, starting with the Eurobarometer on CCUS, but also insights from recent projects including our own work.

The analysis of the Member States will lead to the identification of supporting conditions and barriers to the realization of CCUS projects on the Member State level. We will discuss similarities as well as differences between the countries and also outline the alignment of the situation in the Member States with the goals and plans on the EU level. This will lead to conclusions and recommendations for the future of CCUS in Europe.

Keywords: CCU, CCS, support framework, acceptance, policy alignment
