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Germany urgently needs to get involved in Carbon Capture Utilization and Storage (CCUS)

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Use of Carbon Capture, Utilization and Storage (CCUS)

The complete opening of CCUS technologies to all interested industries is crucial in order to drive forward the reduction of overall CO_2 emissions and improve the economic viability of a CO_2 network through economies of scale. This would reduce the cost burden of using existing grid infrastructures and increase planning security for industry.

However, over the past 15 years, Germany has lost valuable time in dealing with the development and commercialization of CCUS technologies. It is now essential that the key regulatory issues - the Carbon Management Strategy (CMS), the Carbon Dioxide Storage Act (KSpTG) and the ratification of the amendment to the London Protocol - are adopted without delay. Only then can business and industry make investment decisions. For the first major CCUS projects, extended funding opportunities and clear regulation of the areas of application will be necessary.

Parallel planning of new hydrogen and CO_2 networks

The planning and construction of the CO_2 transport network in Germany should go hand in hand with the construction of the natural gas and hydrogen core network. In view of economic and licensing challenges, it is essential to exploit synergies in the parallel development of the hydrogen and CO_2 networks. The goal is a strategically and economically sensible infrastructure development.

The development of the hydrogen core network and the CO_2 transport network should be considered in the context of the existing update of the natural gas network by the Federal Network Agency (BNetzA). This is the only way to exploit synergy potential and realize economic benefits. International experience, particularly from the USA and the Gulf region, shows that a broad application of Carbon Capture, Utilization and Storage (CCUS) is a realistic and cost-efficient solution for reducing emissions.

Application potential of CCUS in the industry

A key area of application is in the lime and cement industry as well as in waste incineration plants, which have already prepared projects for the use of CO_2. The chemical industry could also use CO_2 in manufacturing processes or utilize CO_2 from other sectors. Gas-fired power plants with CCS technology could also be offered in capacity market auctions - an economically more favorable option for dispatchable capacities with a utilization of over 3,000 full-load hours per year compared to the use of green hydrogen.

For companies with high process heat requirements, the combination of natural gas and CCS offers an alternative to expensive green hydrogen. This also applies to parts of steel production, where natural gas with CCS can be more cost-effective than direct reduction with hydrogen (DRI).

International experience and model projects

CCUS technologies are already well advanced in the USA: 15 CCS plants are in operation, which together can capture 0.4% of the country's annual CO_2 emissions. A further 121 plants are in planning or under construction, which will increase CCS capacity to 3% of annual emissions. One example is ExxonMobil's extensive CO_2 storage network on the Gulf Coast, which supports emissions reduction through underground storage.

CCUS technologies are also extensively in the Gulf region, for example in Saudi Arabia and the United Arab Emirates. The Al-Reyadah CCUS project in the Emirates demonstrates that CCUS can be an effective tool for reducing emissions by capturing CO_2 in steel production (800,000 tons per year).

Conclusion

The gradual development of a CO_2 transport network in Germany must be integrated and carried out in parallel with the hydrogen network. The use of CCUS technologies in various industrial sectors, in particular by opening them up completely to all sectors, offers considerable potential for reducing emissions and keeping costs down. The political framework conditions must be created as quickly as possible in order to secure the legal and regulatory requirements for CO_2 storage and transportation. Only in this way can decarbonization succeed in an economically viable manner.