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Expert Commentary

Carbon capture capacities in GECF Member Countries and globally up to 2030

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In the recently published GECF Global Gas Outlook 2050 (GGO, February 2021), the Forum stressed the importance of carbon capture, utilisation and storage technologies (CCUS) for meeting climate goals and bridging the gap between global greenhouse gas emissions and climate targets.

The findings of the GGO are in line with the vision of global leaders and efforts to combat climate change. Energy Ministers of the G20, in their meeting in September 2020, acknowledged the fundamental contribution of CCUS in the Circular Carbon Economy(1). Carbon capture and utilisation can reverse the perception of emissions from obstacle to that of a value through carbon recycling, while storage can remove the carbon from the atmosphere and emission sources. A UNECE report on CCUS states that the technology is essential to meeting climate neutrality and achieving emissions targets, and calls for scaling up the technology and cross border sharing practices(2).

Carbon capture technologies faced several barriers in a 2019 Delphy study(3) - which is a qualitative research methodology that targets a group of experts to answer multiple questionnaires and open-ended questions on the characteristics, benefits and risks for the future of carbon capture technologies. The barriers included financial constraints; especially at lower oil price conditions, lack of demand, and lack of infrastructure.

However, the escalation of health risks during 2020 and the increased momentum towards achieving climate goals stimulated governments around the world to facilitate deployment and scaling up of ready-to-apply negative carbon technologies, mainly the CCUS.

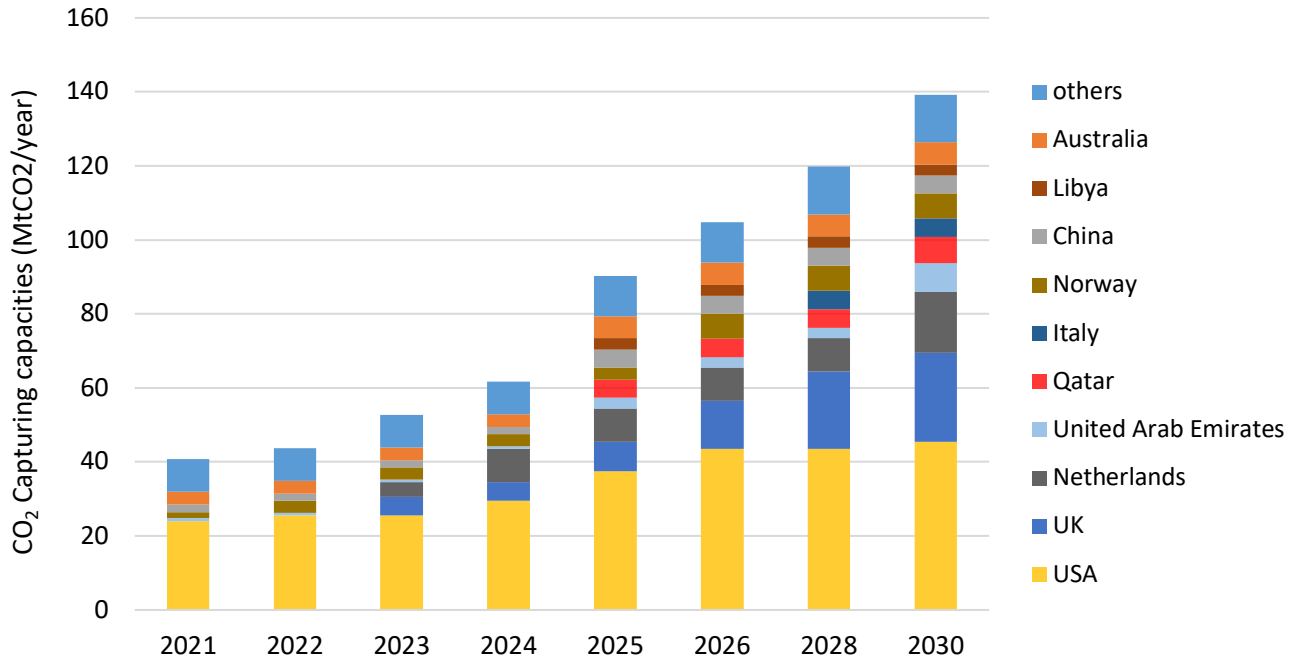
Several governments have announced support of carbon capture projects with funds directed towards low-carbon technologies in general, including CCUS, such as the case of the EU that announced US$12 billion to support climate goals as part of the EU Green Deal Investment Plan. Other nations such as the UK and Norway have directed funding towards projects and infrastructure development. Additionally, the UK and the U.S. governments provided research grants to support R&D in direct air capturing .

Interestingly, a number of oil and gas companies are finding themselves in urgency to leverage the carbon management opportunity through the development of carbon capture projects. For example, Shell, Equinor, Eni, BP, Repsol, BP, and Total are involved in the development of the Teeside project in the UK. Another notable example is the partnership between Shell, Total, and Equinor in developing the Northern Lights projects in Norway.

Similarly, the international oil companies in the U.S. have announced plans to invest in carbon capture startups such as Chevron, while others have taken the lead in developing direct air capturing projects, as in the case ofOccidental Petroleum.

Globally, the existing CCUS capacities in operation are estimated to be 40 million tonnes of carbon dioxide ($MtCO_2$) [4][5]. The current combination of serious climate actions and the need to decarbonise industrial clusters, together with the actionable contribution of oil and gas companies towards reducing emissions, will collectively help to build around 100 $MtCO_2$/year of CCUS capacities by 2030. That is a 250% increase over what was operationally available in 2020.

Figure 1. CO_2 capturing capacity to 2030



Source: GECF Secretariat,IEA, IOGP, Bloomberg, Business Live, and CNBC

Last year, the International Oil and Gas Partnership (IOGP) published the status of existing and planned carbon capture projects relying on data from the Global CCS Institute. This data estimates that around 80 $MtCO_2$/year [6] will be added globally between 2021 and 2030.

The presented projections in *Figure 1 (above)* includes the existing capacities up to 2020 as presented in the IEA Technology report, the IOGP data for planned capacities to come in operation to 2030, and the following capacities:

1- 7 $MtCO_2$/year[7] announced by Qatar in Jan 2021 to capture carbon dioxide from Qatar Petroleum operations that is expected to be completed by 2030
2- 5 $MtCO_2$/year[8] announced by ADNOC to be completed by 2030 through a partnership with Total in the United Arab Emirates
3- 8 $MtCO_2$/year in the UK linked to Humber Zero project[9] which aims at decarbonising the Humber industrial cluster

The GECF Member Countries are expected to have installed carbon capture capacity of around 25 $MtCO_2$ by 2030. Members such as Egypt and Iraq have already floated the possibility of implementing carbon capture projects in their National Development Contributions (NDCs) in repsect to the Paris Agreement and this step could lead to more projects in the future.

Other developments that were not depicted in the projected capacities in *Figure 1* are related to Saudi Aramco's new announcement to collaborate with China on blue hydrogen. Similarly, Japan's refiner, ENEOS, signed an MoU with Saudi Aramco[10] to develop blue hydrogen and ammonia from natural gas while capturing the emitted carbon from the generation process. There is no clear estimation on the size of the carbon capture capacity of these partnerships between the largest oil producer and the largest energy consumers.

The GECF predicts that in the future more projects will be announced to decarbonise industrial clusters, utilise depleted oil and gas resources, and reduce the economic burden of the energy transition.

Carbon capture provides a dual win in terms of capturing emissions from emission points and removing carbon from the air. However, the existing and the planned capacities up to 2030 are not enough to close the global emissions gap that will lead the world to meet its climate goals. Nevertheless, the pace of the expected buildup of carbon capture capacities over the current decade is at a 250% increase compared to what is now in operation gives hope of exponential development in the future.

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