Carbon Capture Tech Offers A Fast Path Toward Climate Goals

By **Hunter Johnston and Jeff Weiss** (November 19, 2020)


Hunter Johnston


Jeff Weiss

Decarbonization of the world economy presents many critical challenges. While much early attention focused on lowering carbon emissions in the production of electricity through the use of renewable energy technologies, many policymakers are now focused on how the world can transition to low or net-zero carbon emission manufacturing and products by using renewable and low-carbon feedstocks throughout the industrial sector.

Lowering the carbon intensity of products manufactured in the industrial sector of our economy through a green pathway represents a crucial opportunity for economic growth. Meeting world decarbonization goals and commitments by 2050 will require using renewable energy to produce hydrogen, ammonia, methanol and other zero-carbon fuels, which can then be used in manufacturing.

The scale of this challenge ensures that it will take many years, and major technological and cost advances will be required before a truly green global economy can be realized. In the meantime, there is an opportunity to immediately and substantially reduce the emissions profile of fossil fuels, which is a critical step to meeting our climate goals. This can be achieved through the wide-scale deployment of carbon capture, utilization and storage, or CCUS, technologies and products.

A green fuels-driven economy achieved through the manufacture of hydrogen, methanol and ammonia will be expensive, and it will take time for it to reach scale and affordability. By contrast, so-called blue fuels — fuels produced using CCUS — are increasingly available at scale, and can be readily deployed in the short term. As a consequence, they can make a major contribution to transitional decarbonization goals within the 2030-2050 timeframe.

That said, there are legal, commercial, regulatory and policy issues in the European Union, the U.S. and elsewhere that must now be resolved to fully support the deployment of CCUS technologies and products. With the right policies in place, global supply chains can facilitate the transition to wider use of blue and green fuels, green products and the greener economy envisioned under the Paris Agreement and other international sustainability scenarios.

The first part of this four-part article discusses the need and new momentum for CCUS. The second part reviews key decarbonization developments in the EU. The third part looks at the potential for CCUS and decarbonization in the U.S. The final installment considers how the interests of multiple stakeholders may align around CCUS, identifies some issues that must be resolved and makes recommendations that may help promote global adoption of CCUS and decarbonized supply chains.

The Need for CCUS

The International Energy Agency, the world's most authoritative body of energy analysts, stated in a September report that CCUS is an important technological option for reducing carbon dioxide emissions in the energy sector, and will be essential to achieving the goal of net zero carbon emissions.[1] In its 2020 World Energy Outlook, issued in October, the IEA further stated that the world is headed toward global warming higher than the Paris Agreement's most aggressive limit of 1.5 degrees Celsius.[2]

If CCUS stands a chance of becoming a pillar of the energy transition, and, as the IEA describes it, "the only group of technologies that contributes both to reducing emissions in key sectors directly and to removing CO2 to balance emissions that are challenging to avoid,"[3] then significant investment over the next two to three decades is required. The IEA submits in its CCUS report that CCUS needs to scale up significantly to meet its sustainable development scenarios and global climate targets and commitments.

"Without a sharp acceleration in CCUS innovation and deployment over the next few years, meeting net-zero emissions targets will be all but impossible," the report states.[4] It also warns that investment has "fallen well behind that of other clean energy technologies," accounting for less than 0.5% of global investment in climate-friendly energy.

For example, to reach the European Commission's zero net carbon dioxide commitment by 2050, the IEA estimates that the amount of CO2 captured must increase to 800 million tons in 2030, from about 40 million tons today.[5]

Notwithstanding the importance of CCUS in meeting these targets, however, the story on CCUS historically has been described by the IEA as "one of unmet expectations" — marred by a lack of commercial incentives, large capital costs and public opposition to storage, especially onshore.[6]

New Momentum

Fortunately, there is increasing momentum for investment into CCUS technologies:

- In September, Rhodium Group LLC released a note detailing opportunities in industrial carbon capture.[7] At the end of 2019, nine of 17 industrial carbon capture facilities operating globally were in the U.S. These facilities had an annual capture capacity of about 24 million metric tons.[8]

- Also in September, the AFL-CIO and the Energy Futures Initiative unveiled what they call "a framework for good jobs in a low-carbon future" that relies substantially on CCUS as a pathway for decarbonization and economic progress. The first element of that plan is a national action plan for the deployment of CCUS technology.[9]

- In October, the Great Plains Institute released a report detailing potential projects, job impacts and modelling scenarios related to deployment of carbon capture in the U.S.[10] GPI has identified up to nearly 150 million metric million metric tons of capturable CO2 per year at U.S. industrial facilities based on near- and medium-term economics.[11]

- Also in October, Columbia University's Center on Global Energy Policy published a report on the levelized cost of carbon abatement,that demonstrates the benefits of CCUS in comparison to other carbon abatement strategies, effectively informing policymakers as to choices relative to costs of carbon reduction.[12]

- The Clean Air Task Force has identified 16 facilities representing at least 19 million metric tons of capture capacity in some stage of development in the U.S.[13] As a result of Section 45Q tax credits, state-level incentives and grant funding from the U.S. Department of Energy, more than 30 carbon capture and storage projects are at various stages of planning and development. These projects together represent a potential doubling of existing global carbon capture and storage capacity.[14]

- The Global Carbon Capture Institute has published an annual study of CCUS projects around the world. In its 2019 status report, the institute estimated the number of large-scale CCUS facilities deployed or under development at 51, of which 19 were operating, four were under construction, 10 were in advanced development in front end engineering and design, and 18 were in early stage development.[15]

Much of the new ambition in development of CCUS projects in the U.S. since 2018 can be credited to the passage of the Section 45Q carbon capture amendments in 2018. The Section 45Q tax credit — which provides an increased monetary incentive for the development of CCUS projects — created the most far-reaching economic inventive for carbon capture in the world, and established a framework upon which a blue fuels economy could be built.

This ambition has greatly accelerated projects that were marginally economical without the incentive, and creates an opportunity for the manufacture of products that will be produced at a lower carbon intensity, as compared to products that are manufactured using fossil energy feedstocks that do not employ CCUS in the manufacturing process.

N. Hunter Johnston and Jeff Weiss are partners at Steptoe & Johnson LLP.

[1] https://www.iea.org/reports/ccus-in-clean-energy-transitions/ccus-in-the-transition-to-net-zero-emissions#abstract.

[2] https://www.iea.org/reports/world-energy-outlook-2020.

[3] Id.

[4] Id.

[5] Id.

[6] Statement of Faith Birol, IEA, see e.g. https://www.msn.com/en-us/news/world/global-climate-goals-virtually-impossible-without-carbon-capture-iea/ar-BB19mCaH.

[7] https://rhg.com/research/industrial-carbon-capture/.

[8] Id.

[9]https://static1.squarespace.com/static/58ec123cb3db2bd94e057628/t/5f712b93b66cd43eed7d344a/1601252258579/Energy+Transitions+%28LEP%29+FINAL.pdf.

[10] https://carboncaptureready.betterenergy.org/analysis/#jobs.

[11] https://carboncaptureready.betterenergy.org/analysis/.

[12] https://www.energypolicy.columbia.edu/research/report/levelized-cost-carbon-abatement-improved-cost-assessment-methodology-net-zero-emissions-world.

[13] https://www.catf.us/2020/07/ccus-interactive-map/.

[14] Id.

[15] Global CCS Institute, 2019. The Global Status of CCS: 2019. Australia, p. 20.