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Encouraging CCS Deployment

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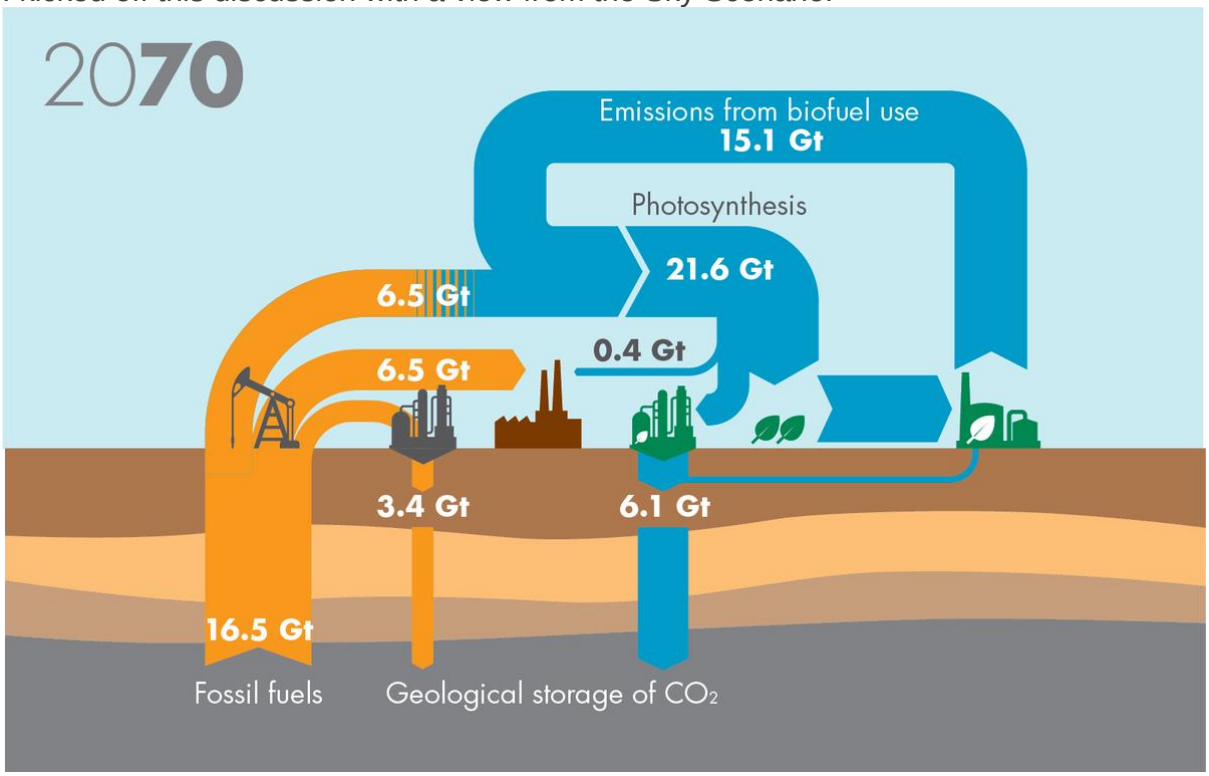
Recently I attended a workshop hosted by **KAPSARC** on the potential for a dedicated mechanism to spur the deployment of carbon capture and storage (CCS). Technology focused mechanisms have worked well within the suite of energy policies used over the past two decades to reduce emissions. Perhaps the best example has been the use of tradable renewable energy certificates (REC) to force deployment of solar and wind within the electricity system. In a REC based policy framework, suppliers may be required to deliver a certain percentage of renewable electricity, which they do by surrendering RECs purchased from the market, with are supplied by various generators depending on the amount of renewable energy they generate.

At the KAPSARC workshop, the proposal the participants discussed was the creation of a certificate that represents one ton of carbon dioxide stored geologically. KAPSARC published an **initial discussion document** outlining the concept, while the workshop itself focused on how the mechanism might be used, where there are opportunities today and what the future might look like for such a mechanism. In the case of the latter, I kicked off this discussion with a view from the Sky Scenario.



> Source: Shell Sky Scenario

In 2070, Sky achieves net-zero emissions in the energy system, but the use of fossil fuels is far from over. Further, there is a distribution by country for achieving net-zero emissions which spans from the 2040s to nearly 2090. By 2070 there are countries at net-negative emissions and countries still showing overall net emissions, but the global system is at net-zero. With fossil fuels still in the energy system (albeit declining), carbon capture and storage plays a critical role in achieving net-zero. The goal is reached by matching remaining emissions to sinks, which is done through commercial and government to government transactions. These transactions could well be based around a storage unit, as discussed in the KAPSARC publication.

The big question facing us today is the process by which such a storage unit is initially developed and then put into use. This is important as the deployment of CCS over the coming thirty years is a critical pre-cursor to achieving net-zero emissions, in that considerable CCS capacity must be in operation by the beginning of the second half of the century to ensure net-zero emissions is achieved as early as possible thereafter.

The participants put forward various approaches, but all involved some form of obligation to deploy CCS against future emissions, with that obligation growing over time. This is similar to the way in which renewable energy requirements grew against overall electricity production. With very little CCS capacity deployed today and realizing that it takes several years between first concept and an operating plant, it might be that by 2030 the obligation in certain markets was just 1-2% storage against emissions. For example, in the EU large emitters sector (covered by the EU Emissions Trading system or EU ETS) with some 1.5 billion tonnes of emissions in 2030, 15-30 million tonnes would require capture and storage under such a proposal, or some 20 medium sized CCS facilities. This is against two in Norway today and none in the remainder of the EU.

Such a proposal in the EU, or for that matter any market, would require careful integration with existing policies (such as the EU ETS) and both significant lead time and certainty to trigger investment decisions in CCS and allow time for such facilities to be built. With that in mind, the workshop also looked at where CCS could be integrated with existing policies with minimal change. One example discussed was the California Low Carbon Fuel Standard (LCFS) which trades within the broader scope of the California cap-and-trade system, but which deals only with the carbon intensity of transport fuels that have their own sub-targets. This system trades at well over $100 per ton of CO2 (compared to <$20 for the cap-and-trade system), more than enough to support a CCS project. In fact, the integration of CCS in this market has been a reality since the beginning of 2019, **as reported by the Global Carbon Capture and Storage Institute** (GCCSI).

A further discussion track was around the possibility of strong voluntary obligations. One workshop participant noted that such a move by oil, coal and gas producers could have considerable future option value, in that it could change the dynamic of the current trend to simply dismiss the future role of fossil fuels by ensuring that adequate CCS capacity

would be available to be able to continue producing in a future environment of very high emission costs or even moratoriums on fossil fuel use.

A final but critical discussion was around the role of such a unit within Article 6 of the Paris Agreement. The need to match sinks against continued emissions in other locations and across borders will be an essential element of achieving the balance called for in the Paris Agreement (i.e. what is widely referred to as net-zero emissions). The proposal that emerged from the discussion was to ensure that a clear bolt-hole is carved out for such a unit in the Article 6 discussions that will hopefully conclude in Santiago at COP25 in December of this year.

Variations of all the above have been under discussion in the side-lines of the climate policy debate for too many years now, with little to no real progress in terms of CCS deployment. The KAPSARC workshop was the first gathering to focus specifically on this subject and bring some concrete ideas to the fore. But more needs to happen for these ideas to take root. Thanks to KAPSARC for their diligence and tenacity in holding the workshop and encouraging the CCS community to build on and hopefully implement the ideas.