

TECHNICAL EXPERT MEETING ON CARBON CAPTURE, USE AND STORAGE

Tuesday, 21 October 2014, 10.00 a.m.–6.00 p.m.

Summary by the facilitator Mrs Ulrika Raab (Swedish Energy Agency)

At the technical expert meeting (TEM) to unlock mitigation opportunities in carbon capture, use and storage in the pre-2020 period, held in Bonn, Germany, on 21 October 2014, Parties, observers, international organizations and the private sector engaged in productive discussions to share their experiences in carbon capture, use and storage; lessons learned through implementation; the challenges involved; and the potential to further scale up implementation efforts in the pre-2020 period. Presentations and interventions were made by representatives of national governments, international organizations, the private sector and UNFCCC support institutions.

POLICIES, PRACTICES AND TECHNOLOGY – GLOBAL STATE OF PLAY

The TEM participants heard that carbon capture, use and storage should be considered as one element of an ultimate and necessary transition to net-zero emissions. This transition requires a plethora of options influencing the future energy production levels and energy mix, such as energy efficiency, and renewable energy and other non-fossil fuel energy sources. Several Parties, international organizations and the private sector highlighted that the specific role of carbon capture, use and storage within this broader transition relates to the capacity to lower the short-term cost of mitigation through the effective utilization of the existing and established asset base.

It was further highlighted by many speakers and participants that the technology is available and expert capacity exists and that these are ready to be deployed on a larger scale. In this regard, the meeting noted that globally there are 22 ‘active’ carbon dioxide capture and storage (CCS) projects (12 operational and 10 under construction) with cumulative expected capture of 40 million tonnes of carbon dioxide (CO₂) per annum by 2017. In the context of assessing the long-term viability of CCS, consideration was given to the availability of suitable and safe storage locations. In this regard, reference to the Intergovernmental Panel on Climate Change (2005) estimates of global storage capacity ranging from 200 to 2,000 Gt CO₂ assured participants of the adequacy of the available capacity. While such capacity is available, there is no standardized solution for CO₂ storage around the world, and CCS projects inevitably need to be tailored to local circumstances and storage sites need to be selected with care.

While the importance of the role CCS could play in the power industry was apparent, the TEM participants also considered the wider role that the technology could play, in particular in industries with significant process emissions, including cement and steel production and agricultural processing. The TEM participants also considered the fact that the origin of the CO₂ could be biological. For many such industrial and agro-industrial installations, with relatively small volumes of emissions, CCS would pose a challenge; this suggests that there may be a need to create an infrastructure, possibly using hubs, to ease capture and transportation.

In addition to CCS, the TEM also addressed CO₂ utilization. The current utilization rate is estimated at approximately 80–120 Mt CO₂ per year. The majority of that, over 60 Mt CO₂ per year, is used in enhanced hydrocarbon recovery. Other potential uses of CO₂ could be found in areas such as synthetic fuel production, agriculture for enhanced crop production or algae growth, as well as in the production of chemicals and plastics. It was noted that the success of a wider range of alternative uses would require further research and development.

Participants were of the view that carbon capture, use and storage would benefit from a price on carbon, but that there is currently a weak carbon price signal in many jurisdictions.

Several success stories were shared during the meeting, including that of the Norwegian company Statoil. In 1991, Norway imposed a CO₂ tax to incentivize increased efficiency and reduced flaring. This climate policy essentially attached a price to CO₂ and created business incentives to store carbon, and has since resulted in 0.9 Mt CO₂ being stored per annum (15 Mt CO₂ in total). The meeting also considered the success of the world's first power station using large-scale carbon capture. A 110 MW retrofit of SaskPower's Boundary Dam coal-fired power plant in Saskatchewan, Canada, has recently started operation and is to trap around 1 Mt CO₂ per annum. The captured CO₂ will be injected into nearby oilfields, where it will also be used to enhance oil recovery. The story of the "Dream Production" project was also shared in the meeting; the project will launch the first CO₂-based polyols on the market, used for the production of polyurethane foam. Thus, Bayer MaterialScience has succeeded in turning a waste gas into a useful raw material by collaborating with partners in industry and academia. The presentation made by the representative of the United Arab Emirates showed that carbon capture, use and storage can also be seen as part of a holistic sustainable development strategy.

Carbon capture, use and storage remains a capital-intensive technology. Access to finance and capital is a key barrier to such projects in developed and developing countries alike. The lack of understanding of carbon capture, use and storage in the financial sector also negatively affects access to finance.

Challenges and barriers related to scaling up deployment of carbon capture, use and storage were discussed. Key barriers and challenges include:

- Low or absent price on carbon;
- Complexities of developing a business case;
- Storage regulations and liability;
- Access to finance and capital;
- Safe operational procedures;
- High costs of infrastructure ;
- High costs of finance;
- Low level of public finance;
- Public acceptance.

IMPLEMENTING ACTION: POLICY, FINANCE, TECHNOLOGY AND CAPACITY-BUILDING

Various policy options, actions and technologies that can assist countries in addressing the challenges and removing barriers faced in scaling up the deployment of carbon capture, use and storage were discussed by the delegates and the presenters. Such policy and technology options include:

- A clear regulatory environment grounded in national policy priorities;
- Identification and engagement of key stakeholders;
- Economic instruments that attach a price to carbon, such as a carbon tax or emissions trading;
- Economies of scale that reduce finance and infrastructure costs; this includes the sharing of infrastructure among different projects;
- Research and development policy.

The International Energy Agency CCS road map suggests that, in order to overcome one of the key barriers – access to capital and finance, governments, industry and the finance community need to work together to develop a framework that would encourage adequate CCS investment.

WAY FORWARD

The discussion on the way forward saw TEM participants providing concrete actionable suggestions on what the UNFCCC process can do to help Parties address barriers and realize their ambition in deploying carbon capture, use and storage in the pre-2020 period. It was mentioned that lessons could be learned from the discussions on CCS related to the clean development mechanism. Some of the specific proposals made by participants are grouped below.

ACTION BY GOVERNMENTS

Recognizing that the main challenges and barriers lie not necessarily in the technology itself but elsewhere, as mentioned above, TEM participants considered that Governments play a key role in addressing the challenges of carbon capture, use and storage. All the experiences presented in the meeting demonstrated and highlighted that a clear policy and legal framework is needed for these projects to be implemented. Some of the ideas discussed during the TEM were:

- (a) Making carbon capture, use and storage part of nationally appropriate mitigation actions and intended nationally determined contributions;
- (b) Supporting research and development, pilot projects, and development of carbon capture, use and storage related regulations and capacity-building.

INTERNATIONAL ORGANIZATIONS

Several delegates expressed the view that existing institutions under the UNFCCC, in particular the Technology Executive Committee (TEC) and Climate Technology Centre and Network (CTCN), need to be actively engaged in assisting countries in scaling up the development and deployment of carbon capture, use and storage by providing information on it, as well as by supporting non-Annex I Parties' participation in existing international partnerships.

Guidance to such institutions, including the Green Climate Fund, the TEC and the CTCN, could be provided to build a pipeline for the future funding of programmes and policy options.

UNFCCC SECRETARIAT

Parties greatly appreciated the open exchange of views and experiences during the meeting among Parties, international organizations and the private sector. Some Parties suggested continuing the technical work by having a more focused dialogue on specific issues.

An updated technical paper on the mitigation and sustainable development benefits of actions, initiatives and options to enhance mitigation ambition will be prepared to include the discussions that took place during the meeting.