Breakout Group 1

Engineered capture, utilisation & geological storage

Reporting to the CDR &CCUS Expert Meeting Plenary

Jongikhaya Witi
BOG 1 Rapporteur

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UN environment programme

Guiding Questions

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Q1. Assessment Criteria

- General acceptance of the assessment criteria as presented in the background paper
- New guidance should also include an equivalent of Volume 1 of the 2006 IPCC guidelines to deal with cross-cutting issues and general principles
- Clear guidance on the treatment of import and export of captured CO2 (and derived products) as well as cross-boundary transport and storage
- Significance - The Party's Long-term Low-Emission Development Strategies (LT-LEDS) provide some insights into the future uptake of CDR technologies

Q1. Assessment Criteria

- Important to pay attention to durability as we cannot assume permanent storage
- Criteria for significance should also be considered;

Q2. Completeness (1 of 2)

- Production and use of synthetic fuels from captured CO2 sources from the atmosphere and biosphere
- BECCS – current guidance in Chapters 2 and 5 of Volume 2 addresses BECCS. Further enhancement of the guidance would allow the chapter to also deal with DAC
- Storage of other forms of biogenic carbon in the lithosphere (e.g., bio-oil injection/biomass burial)
- Consider guidance on in-situ and ex-situ mineralisation. enhanced weathering (check with BOG 2)
- Guidance Structure: guidance to be developed could focus on CDR/CCUS/CCS process steps rather than focusing on the various CDR technologies
- Sea water capture and its interaction with the atmosphere and ocean requires modeling to isolate the atmospheric CO2 signal.

Q2. Completeness (2 of 2)

- Consider different types of mineralisation, especially mineral products (e.g. biogenic CO2 going to mineral products, and in the future, we might have DAC going to mineral products)
- Consideration of fugitive CO2 emissions from Shipping in international waters.
- Burial of carbon in an underground chamber (not geological storage) [cross-BOG issue] might require its own category.-

Q3. Taxonomy of sources and sinks

- Categorisation of DAC
  - Option 1: Air capture is distinctively different from other IPCC categories and could be treated in a separate category (e.g. Volume 6) and clarify different end-use cases (within or beyond IPCC categories) for any captured CO2.
  - Option 2Also consider DAC as an industrial activity that processes CO2 and therefore placed under the IPPU sector
- Need to track CO2 imports and exports (evaluate the adequacy of existing guidance – e.g. for shipping)
- Can consider the following options
  - Geological storage can remain in Chapter 5 of Volume 2
  - In accordance with the current IPCC guidance, CO2 captured should be reported where it occurred
- Clear guidance on the treatment of cases with multiple capture sources that lead to single or multiple storage sites (attribution problem).
- Important to trace the origin and fate of CO2 to allow for differentiation

Q4. IPCC Guidelines methodologies

- Chapter 5, Volume 2 already addresses EOR (including a T3 method) but authors could consider reviewing existing guidance in accordance with new developments.
- If a country is conducting these activities, it should use the data that is available from CDR and CCS projects (it is a mitigation project Afterall)
- Should we consider T1 and T2 methods for small-scale projects as using T3 might not be economically feasible (e.g. biogas to biomethane upgrading)?
- Tracking the connection between CO2 capture by specific industries and use/stored (fate problem)

Q5. Feasibility of Tier 1 methods

- Some parts of the CDR and CCS technology value chain are pliable to tier 1 methods (e.g., pipeline transport), and others are not (e.g., storage).
- Authors can consider the principles followed in the treatment of non-energy use of fuels to deal with captured carbon in cases of CO2 capture for utilisation (in particular, the conversion to mineralised products) instead of storage – might consider an approach equivalent to how the IPCC guidelines deal with non-energy use of fuels under IPPU
- Consider fugitive CH4 EFs for displacement by CO2 at geological storage sites (EOR).
- 2006 IPCC do not deal with fugitive CO2 EF for transportation by Ship (T3 method only), rail, road any other form of transport.

Q6. Higher tier methods

- The general view is that there is less of a challenge in developing a T3 methodological guideline. However, therefore could be a practical challenge to implement a tier 3 method (e.g. in cases of long CO2 pipelines (> 1000 km of pipeline)
- Even for T3 methods, more guidance is needed (e.g. clarifying minimum requirements such as monitoring points)
- New guidance needs to address the issue of baselines with respect to storage (e.g. to isolate natural CO2)
- Need to reexamine the relevance of guidance in Annexure 5.1 on the summary description of potential monitoring technologies for geo CO2 storage sites.

Q7. Verification Activities

- Assessment of the role of remote sensing, i.e., whether top-down measurements could be used to verify CDR activities, should be investigated.
- Current research is underway to look at top-down verification methods for CO2 capture from point sources.
- Verification should not be prescriptive. Every project is different; therefore, the monitoring regime differs from project to project.
- Reach out to the community conducting top-down emission quantification approaches to enhance guidance on top-down methods for verification of CDR and CCS activities (e.g. tracking CO2 release episodes)
- Explore the use of data and information from market-based instruments that are linked to CDR and CCS technologies (e.g. ETS trading scheme.)
- Authors to emphasise the role of stakeholders involvement in the QA/QC processes for CDR and CCS processes.
- Consider qualitative indicators for verification
- Conducting material balance as a form of verification for the whole CDR/CCS/CCUS value chain.

Raised Issues to be consider in later stages

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Relevant issues to consider

- For cross-boundary transfers of captured carbon, the cradle-to-grave principle should apply (i.e. no negative accounting from the source if there is no evidence of storage);
- Addressing durability and permanence is important;
- Consider guidance with respect to CCS onboard a ship;
- Consider the circularity of CO2;
- Injection of carbon-containing materials (e.g. bio-liquids);
- Geological CO2 storage: Observation is that there is more storage capacity in shallow waters than in deep sea waters. Therefore, storage is unlikely in deep water, and more potential in shallow waters.

Relevant issues to consider

- Several elements of the system are not being reported (e.g. activity data for utilisation in most cases is not readily available) – Authors can consider some of the issues related to CDR and propose guidance on how to navigate some of the issues (e.g. treatment of confidential data)
- Address potential double-counting from the use of synthetic fuels (e.g. efuels)
- Assess the glossary of terms for any changes that may be needed.
- Revaluation of the principles concerning CO2 purity in the existing IPCC guidance.