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Article 6.4 Mechanism. Call for submissions from COP27 on Activities involving removals.

We would like to submit comments in response to the call for submissions from COP27 and on the Information Note A6.4-SB004-AA-A04.

The SB, at its first meeting, considered the Concept note "Removal activities under the Article 6.4 Mechanism" (A6.4-SB001-AA-A05). IEAGHG provided input in relation to this concept note which was presented by the secretariat at SB002. We note that the points we made on the CDM Modalities and Procedures for CCS (decision 10/CMP.7 (2011)) and the IPCC GHG Guidelines (2006) were included in the Draft Recommendation on Methodologies A6.4-SB002-AA-A05 and in the Information Note A6.4-SB002-AA-A06.

Recently the IPCC has issued a Fact Sheet on removals. This summary reminds us of the need for removals to achieve climate goals, and summarises the different types of removals, both land-based and engineered, observing that all types have positive aspects and also trade-offs and risks. IPCC_AR6_WGIII_Factsheet_CDR.pdf . Such balance should be reflected in the work of the Article 6.4 Supervisory Body.

In terms of accelerating the large-scale demonstration of engineered removals, at COP27 the CDR Launchpad initiative was launched by the administrations of the USA, UK, Denmark, Canada, Japan, Norway and the European Commission. This aims to stimulate full-scale engineered CDR by commitments to investing in demonstration projects and the sharing of subsequent learnings, with the target of reducing costs to under $100 per tonne (CDR Launchpad Announced at COP27).

Regarding the call for submissions from COP27 on activities involving removals, including appropriate monitoring, reporting, accounting for removals and crediting periods, addressing reversals, avoidance of leakage, and avoidance of other negative environmental and social impacts, we would like to make the following points:

Monitoring, reporting and accounting: Decision 10/CMP.7 (2011)) and the IPCC GHG Guidelines (2006) provide established and internationally recognised information and guidance on the monitoring and reporting for CO_2 geological storage, which when used for removals will demonstrate and report permanence of removal (for more detailed summary see our input of the 12/09/22).

Reversals: Decision 10/CMP.7 (2011)) (and also the EU ETS and other mechanisms) requires the surrender of allowances equal to that of any reversal. This is widely accepted.

Avoidance of other negative environmental and social impacts: Decision 10/CMP.7 (2011)) requires "in conducting the environmental and socio-economic impact assessments, best available techniques will be applied in order to facilitate a high level of protection for the environment as a

whole and for communities" and this should be also applied for removals based upon geological storage.

Regarding Information Note A6.4-SB004-AA-A04 , we would like to make the following observations and comments.

It is good that it has separate sections on methodologies for land-based and for engineering-based, as these are very different techniques and with different levels of permanence.

However we have concerns with the bias and unbalanced nature of the Information Paper.

Section 3.2 on Eligibility. Paragraph 39 has a large section for arguments against engineered CDR and against CCS, a section in favour of land-based, and a small section at the end for all types of activities including engineered CDR. This seems to be very selective in what has been drawn from submissions, and ignores IEA and IPCC evidence on the need for removals including those based upon geological storage and the broader role and efficacy of CCS and previous A6.4 inputs. It cites much from input against engineered-based techniques which itself relies on grey literature.

Specifically:

Parag 39 (a) (i). Engineering-based removals based upon DACCS do not pose significant risks to human rights and the environment. In fact the opposite, DACCS would have much less impact on land and water than afforestation (see fig 6b Realmonte et al, (2019)) .

Parag 39 (a) (ii). Geological storage does not pose significant risks, especially when IPCC and other international guidelines are followed (see (decision 10/CMP.7 (2011)) and the IPCC GHG Guidelines (2006) (upon which CO_2 geological storage regulations are based (Dixon et al 2015)). Also the mention of IPCC here should make it clear that this point is looking only to 2030, ie near-term only, and even then CCS is still in the top 10 mitigation options for the energy sector and in the top 8 mitigation options for industry in the views of IPCC here (IPCC AR6 WGIII).

Parag 39 (a) (iv) . CCS projects have been operating for decades with full success. Some of the first-of-a-kind demonstrations to new flue gases have provided useful learning-by-doing, and even as demonstrations have still mitigated many millions of tonnes of CO_2. (eg Boundary Dam IEAGHG 2015-06, Port Arthur IEAGHG 2018-05, Quest IEAGHG 2019-04).

Parag 39 (a) (v) . Any country with the appropriate geology, and there are very many around the world, can undertake geological storage (eg Ringrose and Meckel 2019)

Parag 39 (a) (xi) . Sustainable development. DACCS would have much less impact on land and water than some land-based options such as afforestation (see fig 6b Realmonte et al) . Specifically for SDG6 Clean Water, there is the potential for some DACCS technologies to even be net producers of water (Beuttler et al 2019, Fasihi et al, 2019, and IEAGHG 2021-05). For geological storage assessed against the sustainable development goals Mikunda et al (2021) conclude "*When evaluated against the SDGs, CCS shows several positive 'enabling' interactions, and fundamentally CCS is 'indivisible' with SDG 13 regarding combating climate change. ……. CCS is therefore a sustainable option to combat climate change and does not prohibit the achievement of any other SDG* "

Regarding Section 7 on Methodologies for Engineering-based CDR, it is good that it acknowledges the CDM Modalities and Procedures for CCS (Decision 10/CMP.7) . However we note that reference to the IPCC GHG Inventories 2006 chapter on CCS is now omitted when it is important for countries

to follow in undertaking and reporting such activities and was included in previous documents, and we recommend that it is included again.

In Section 7, the points made in paragraphs 247, 263, 264, 275, if considered valid by the Supervisory Body, should in fairness then be applied also to Chapter 6 Land-based activities.

Paragraph 272 is untrue, DACCS actually has much less competition for water than land-based techniques such as afforestation (Realmonte 2019) and some DACCS techniques can actually be net-producers of water (Beuttler et al 2019, Fasihi et al, 2019) and IEAGHG 2021-05).

We hope the next revision of the Information Note for SB005 will be more balanced.

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IPCC_AR6_WGIII_Factsheet_CDR.pdf

Carbon Dioxide Removal Launchpad Announced at COP27; Governments Commit to Build Demonstration Projects and Share Information – Mission Innovation (mission-innovation.net)

Dixon, McCoy, Havercroft (2015)- Legal and Regulatory Developments on CCS International Journal of Greenhouse Gas Control 40 (2015) 431–448

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Integrated CCS Project at Saskpower's Boundary Dam Power Station IEAGHG 2015-06,

The Carbon Capture Project at Air Product's Port Arthur Hydrogen Production Facility IEAGHG 2018-05,

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IPCC WGIII. Mitigation of Climate Change. SPM p50 Figure 7.

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IEAGHG Technical Report 2021-05 "Global Assessment of DACCS Costs, Scale and Potential

IEAGHG is an international collaborative research programme, established in 1991 by the International Energy Agency (IEA). We are autonomous from the IEA. The programme is funded by 18 member countries and 18 organisations. The technology of primary focus is carbon dioxide capture and geological storage (CCS). Our scope includes engineered carbon dioxide removal (CDR) techniques such as direct air capture with storage (DACCS) and bioenergy with CCS (BECCS). Our activities include producing over 360 technical reports (externally peer-reviewed) on all aspects of CCS including technology development and deployment, running the largest conference series on CCS (the GHGT series), operating Networks of experts and Summer Schools, and instigating a scientific journal of impact factor up to 5.11. Our work is used, for example, to inform the IPCC, UNFCCC, IEA, London Convention and ISO, and by USDOE, US EPA and by our other members in the development of climate change mitigation policies and technologies.