



IEAGHG Information Paper 2014-22: IPCC 5th Assessment Report and CCS

The IPCC has published its 'Synthesis Report' of its 5th Assessment Report, the most comprehensive assessment of climate change yet undertaken. This Synthesis Report brings together the three underlying reports already published on the Science, Impacts and Adaptation, and Mitigation, and so aims to provide a clear and up to date view of the current state of scientific knowledge relevant to climate change, produced by many hundreds of scientists. The key messages were well reported in the news media, including:

- Human influence on the climate system is clear
- The more we disrupt our climate, the more we risk severe, pervasive and irreversible impacts
- We have the means to limit climate change and build a more prosperous, sustainable future
- Energy production remains the primary driver of GHG emissions
- The window for action to limit temperature rise to 2C is rapidly closing.
- Ambitious mitigation is affordable
- Unmitigated climate change would create increasing risks to economic growth

The report presents its analyses in terms of risks. The risks of climate change and its impacts are immense and should be of great concern to all. The report also examines pathways to reduce the risks, by mitigation of emissions and by adaptation. For example one headline-grabbing message is that fossil energy without CCS should be phased out by 2100. The challenge is great, but the risks and costs of not tackling climate change are far greater.

In terms of CCS, its importance cannot be hidden, both for reducing emissions from fossil fuels and also for combining with bioenergy to take CO₂ out of the atmosphere (BECCS or BioCCS). The importance of CCS jumps out of table SPM2 (Table 3.2 in the full report) where their analysis shows that removing CCS from the mix will increase mitigation costs by a massive 138%. This is by far the highest increase from any of the technologies analysed (bioenergy, wind, solar, nuclear) and may not allow a 450ppm scenario to be achieved at all - *"Note that many models cannot reach concentrations of about 450 ppm CO₂eq by 2100 in the absence of CCS"*. So we really do need CCS in the portfolio of low carbon energy technologies.

CCS also has benefits for the fossil fuel producers, where the report points out that the availability of CCS would reduce the adverse effects of mitigation policies on the value of fossil fuel assets.

There is much of importance to be drawn out of these comprehensive reports, which are available at <http://www.ipcc.ch/>.

IEAGHG provided input to the Synthesis Report in relation to CCS and this appears to have been taken on. Now that the report is published and the expert reviewer comments made public by IPCC, we can share our input as Annex 1 to this information paper.

Tim Dixon
7 Nov 2014



Annex 1. Expert Reviewer input to AR5 Synthesis Report First Order Draft

With reference to SYR section 4.3 'Response Options for Mitigation' (page 99 lines 30-33) I have serious concerns that the main conclusions given are not consistent with the underlying WGIII Chapter 7 report, and hence distort the balance and objectivity of this part of the SYR. My comments refer specifically to the barriers for CCS, where both the language and the actual barriers differ to those in the underlying WGIII report.

This is troubling because the underlying Chapters such as Chapter 7 go through an extensive multi-stage peer review process, the global scientific community had opportunity to review the description of CCS barriers and risks described in Chapter 7, and the final version of the wording in Chapter 7 therefore reflects the views of the global scientific community. In the process of abstracting what was written in Chapter 7 to fit into the TS and then the SPM and now the SYR, the meaning of what was originally in Chapter 7 has been lost and an educated reader of the SYR would arrive at different conclusions to those intended. To be clear, what is now in the SYR does not accurately reflect what was in Chapter 7 and the broad body of peer reviewed literature that was drawn upon in the CCS parts of Chapter 7.

The SYR section 4.3 page 99 lines 30-33 focuses disproportionately on the negative points from Chapter 7 and they also exaggerate those points being made. For example the strongest negative statements in Chapter 7 are "concerns... which are addressed by growing body of literature" (Chap 7.5.5 page 27) and "significant challenges in growing CCS to the gigatonne level.....none of which are showstoppers" (7.11). But these become "barriers to large scale deployment" in the SYR.

Another example is that transport risks are listed as a barrier in the SYR, but in the underlying Chapter 7 section 7.6.4 on CO₂ Transport there are **no** references to barriers due to risks of transport, in fact the opposite because of the extensive experience in North America with CO₂ pipelines.

The SYR quotes the WGIII SPM and the TS, however on the point of barriers these themselves do not accurately reflect the underlying WGIII Chapter 7. Where Chapter 7 does refer to some 'significant challenges', these are different to the barriers listed in the SYR. For example, section 7.11 says "Significant challenges remain in growing CCS..... to the gigatonne level. These challenges, none of which are showstoppers, include lowering costs, developing needed infrastructure, reducing subsurface uncertainty, and addressing legal and regulatory issues".

In fact it is well known that the main barriers to large-scale deployment of CCS are not those listed in the SYR, but are primarily policy and economic. The IEA CCS Roadmap (2013) states "While technical challenges obviously remain in integrating the parts of the chain, the major impediment is the lack of policy and economic drivers." (page 20) and "The technical risks associated with capture and storage can be progressively reduced through learning-by-doing (*i.e.* implementing more projects), developing transport networks that can link multiple sources and sinks, and developing (or adopting) management systems to manage risks inherent in resource development. However, the political risks presented by indecisive policy making and market uncertainties remain. This situation is compounded by a lack of understanding and experience with CCS in the finance sector, and a focus on the additional costs of CCS rather than the overall competitiveness of low-carbon energy production in the long term. Governments, industry and the finance community need to work together to identify and develop the key features of a model incentive framework (as part of a broader emissions reduction framework where one exists) that would encourage adequate CCS investment." (Page 21). However this IEA document was omitted from the wide range of IEA publications used by Chapter 7 and so can't be used in the SYR. To note also that IEAGHG has published many reports covering all of the technical CCS topics covered by Chapter 7, but only two were used.



A suggestion for an improved SYR to mitigate these inconsistencies would be to replace “Barriers to large-scale deployment of CCS technologies include concerns about the operational safety and long-term integrity of CO₂ storage, as well as risks related to transport and provision of biomass feedstock. {WGIII SPM 4.2.2, TS 3.2.2} “

with

“Technical concerns around large-scale deployment of CCS technologies include the operational safety and long-term integrity of CO₂ storage, however there is a growing body of literature, experience and CCS-specific regulations which address these such that they are not considered as barriers. Barriers to large-scale deployment of BECCS include risks related to provision of biomass feedstock. {WGIII Chapter 7 sections 7.5.5, 7.6.4, 7.9.2, 7.9.3} “