IEAGHG Information Paper: 2015-IP16; the IEA Position on CCS

When the World Energy Outlook (WEO) 2015 Special Report on Energy and Climate change [1] was launched I fended quite a number of questions from the Carbon Capture and Storage (CCS) community regarding the IEA's attitude to CCS. The underlying issue was that the Executive Summary did not mention CCS at all. Since the messages in this report were aimed at the COP21 negotiations, some inferred that the IEA had abandoned CCS.

In the Executive Summary the IEA proposes a bridging strategy that could deliver a peak in global energy-related emissions by 2020. A commitment to target such a near-term peak would send a clear message of political determination to stay below the 2 °C climate limit. The peak can be achieved relying solely on proven technologies and policies, without changing the economic and development prospects of any region, and is presented in a "Bridge Scenario". The technologies and policies reflected in the Bridge Scenario are essential to secure the long-term decarbonisation of the energy sector and their near-term adoption can help keep the door to the 2 °C goal open. For countries that have submitted their INDCs, the proposed strategy identifies possible areas for over-achievement. For those that have yet to make a submission, it sets out a pragmatic baseline for ambition.

The Bridge Scenario depends upon five measures:

- Increasing energy efficiency in the industry, buildings and transport sectors.
- Progressively reducing the use of the least-efficient coal-fired power plants and banning their construction.
- Increasing investment in renewable energy technologies in the power sector from $270 billion in 2014 to $400 billion in 2030.
- Gradual phasing out of fossil-fuel subsidies to end-users by 2030.
- Reducing methane emissions in oil and gas production.

However, you have to go to the main report to better understand that the proposed bridge technology is aimed at the near term i.e. up to 2020. This whole strategy is aimed at delivering;

"a near term peak in emissions to send a message of political determination to stay below the 2^0C limit".

This seems to be the fact that those readers who approached me have missed when reading the summary which has led to the confusion, I think, on the IEA's position. Personally I feel the technologies selected to make an impact up to 2020 are the correct ones. Whether measures like energy efficiency can make the required impact in the time frame of up to 2020 in my mind is debatable – particularly the housing sector – but that is another debate.

Equally, nuclear was not included in the bridge scenario although the IEA do acknowledge that it will play a role. They key reason for its exclusion was the long lead times with regards to new nuclear power plant construction, which tends to exclude this low carbon technology option because of the near-term focus of the scenario.

The discussion in the main report on the Bridge Scenario however does include a discussion on the role of CCS.

[1] https://www.iea.org/publications/freepublications/publication/weo-2015-special-report-energy-climate-change.html

The section on the Bridge Scenario in the main report makes a strong statement with regard to protecting fossil-fuel assets through CCS;

"The policy framework in the Bridge Scenario includes a reduction in the use of the least-efficient coal-fired power plants. But the adoption of this policy does not mean that investment even in efficient coal power plants is without risk. Any strategy to realise the long-term 2 °C target will require a level of decarbonisation of the energy sector that cannot be achieved even with the most efficient coal power plants, as they are constituted today. In the very long term, gas-fired power generation will also be incompatible unless measures are taken to abate their CO_2 emissions. Investors in new fossil-fuel power plants, especially coal-fired power plants, need to ensure not only the high efficiency of the plants, but also that they are, where possible, suitable for later modification to incorporate carbon capture and storage (CCS), i.e. that they are "CCS-ready" to ensure that the capital invested in these assets is not wiped out as climate targets are strengthened. Action can be taken at the time of design and construction to improve the technical and economic feasibility of retrofitting CCS, notably:

- *Ensuring sufficient space available on-site for the installation of additional CO2 capture equipment.*
- *Locating the plant in reasonable proximity to an existing possible CO2 storage site, or one that is likely to become available by the time of retrofit.*
- *Verifying that local water will continue to be available in sufficient quantities for the needs of the plant, as CCS increases water requirements."*

This is a policy that we would fully endorse; that you only build the most efficient fossil fuel power plants and they are built CCS-ready. As the organisation that did the original work on capture/CCS-ready, it is interesting to note the embellishment to the normal statement in the WEO with regard to water. Given the impact that climate change will have on water availability such a statement is warranted. However I do not fully agree with the comments that retrofitting with CCS will increase water demand. In simple terms, retrofitting post combustion capture and a rebuild to introduce IGGC can increase water demand but there are options to mitigate this effect, say by replacing a water cooling system with air cooling.

Following on, "*the technologies and policies reflected in the Bridge Scenario are deemed by the IEA to be essential to secure the long term decarbonisation of the energy sector and their near-term adoption can help keep the door to the 2 °C goal open"*.

It is in the period after 2025 that the report then sees CCS as deployable, i.e. the long term.

Chapter 4 – Long-term energy sector transformation – is a considerable section devoted to CCS. In the highlights of that section the position regarding CCS is set out as follows:

"CCS technologies are vital to decarbonising the power supply and industry in the 450 Scenario, capturing 52 Gt CO_2 from 2015 to 2040, of which 5.1 Gt CO_2 is in 2040. The fuel consumption by CCS-equipped facilities creates revenues of $1.3 trillion for both coal and gas producers respectively from 2015 to 2040. Deploying CCS at scale drives down costs and improves its competitiveness as a CO_2 abatement option in the power sector. Knowledge of CO_2 storage opportunities is expanding, but national level attention is needed to support the widespread adoption of CCS".

This is quite a clear and unambiguous statement on the need and role for CCS and is consistent with messages on CCS in other IEA publications.

In recently published Energy Technology Perspectives (ETP) 2015 – Mobilising Innovation to Accelerate Climate Action[2] – CCS is recognised in the online summary as one of the key technologies the IEA report discusses in terms of regulatory strategies and co-operative frameworks to advance innovation in.

The Executive Summary highlights:

- The recent unexpected reduction in fossil fuel process could be a bonus for CCS. The report states that; in the case of CCS, lower fossil fuel prices reduce costs associated with the energy penalty inherent in adding CCS to energy generation or industrial processes. In turn, this reduces the level of support needed from governments to promote private investment in reducing the carbon impact of continued fossil fuel use in these sectors.
- Another key issue recognised by the report is the ability of CCS to enable fossil resources use while still contributing to CO_2 emissions reduction goals, which requires governments to shape markets that stimulate private investment in CCS and provide vital early commercial experience.

Once again I would agree with these position statements regarding CCS. The full report is currently not available online but I expect these statements on CCS to be further emphasised in detail in the main report.

Overall I can see no support for any proposition that the IEA is anything but strongly supportive of CCS deployment.

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[2] http://www.iea.org/etp/etp2015/