IEAGHG Information Paper: 2017-IP19; EU ZEP report on "CCS and Europe's Contribution to the Paris Agreement - Modelling least-cost CO_2 reduction pathways

The European Technology Platform for Zero Emission Fossil Fuel Power Plants (ZEP) is a coalition of stakeholders who support CO_2 Capture and Storage (CCS) as a key technology for combating climate change. ZEP serves as advisor to the European Commission on the research, demonstration and deployment of CCS. Further details on ZEP can be found at http://www.zeroemissionsplatform.eu/

ZEP recently released its 5th Annual Market Assessment report, "CCS and Europe's Contribution to the Paris Agreement - Modelling least-cost CO_2 reduction pathways". The report estimates that the value of CCS to the EU could exceed €1 trillion between now and 2050, and that CCS could be worth more than €50 billion each year thereafter.

The full report can be found at:
http://www.zeroemissionsplatform.eu/news/news/1668-2017-european-parliament-hearing-on-ccs-and-launch-of-zeps-5th-annual-market-economics-report-.html

The Executive Summary of the report is given below for members' reference.

Executive Summary

For this, the fifth iteration of ZEP's Market Economics analysis, a new energy systems model was developed to encompass the whole energy system, including the heat, power, industrial and transport sectors.

A total of 10 countries were modelled and results were drawn for both the individual countries and the 10 countries combined. The following conclusions can be drawn;

- Across the European energy system, ZEP's modelling shows that the value CCS to the EU could be in excess of €1 trillion by 2050 alone.
- In the longer term, and as European countries move towards net zero emissions, the value of CCS is expected to further increase to more than €50 billion per annum.
- When CCS was not available to the model, total emissions in 2050 from the 10 countries modelled were found to be 3 to 4 times higher.
- Combined Heat and Power/District Heating is a low hanging fruit is the first and fastest way to increase supply side energy efficiency in Europe. It is selected most in northern and eastern countries where the climate and social traditions make CHP appropriate. In the longer term, there is economic and climatic value in combining CHP with CCS to yield further emissions reductions.
- Increased electrification can avoid distributed emissions and plays a vital role in emissions reduction from transport, heating, and cooling. In certain circumstances, hydrogen also has the potential to be a key low carbon energy vector for reducing emissions in these sectors. In either scenario, CCS has been shown to have an important role to play.
- The future of energy intensive industries including cement, steel and oil and gas is highly dependent on CCS. For these sectors and many more, CCS is critical to retaining high-skilled jobs and boosting economic activity across EU Member States in an increasingly carbon-constrained world.
- The modelling demonstrates the high value add that can be achieved by shifting spending on energy away from imported fuels to investments in infrastructure, renewables and local indigenous fuels. This can have important co-benefits for energy security objectives, employment and sustainable industrial activity.

- Infrastructure investments are needed now to achieve the lowest emissions and lowest costs out to 2050. CCS infrastructure can unlock emissions reductions across the whole energy system with significant potential for cost reductions through cross-border initiatives and sharing of infrastructure.
- The countries studied are different and the model shows that local solutions and indigenous fuels, as well as weather patterns, should be taken into account when countries develop their Integrated National Energy and Climate Plans under the proposed EU Energy Union governance arrangements.
- CCS facilitates the integration of renewables with near zero CO_2 backup power. Across the various scenarios, EU targets for renewables deployment (20% in 2020 and 27% by 2030) are expected to be achieved and, by 2050, renewables are expected to represent more than 50% of the energy system on an energy usage basis for cases both with and without CCS.
- Biomass is shown to be an important component of the future European system because of its potential role in reducing CO_2 emissions from the heating sector. Biomass as a renewable energy is modelled to contribute the largest energy content of the total energy system, approximately equal to ambient heat. Sustainable use of Biomass/Biofuels combined with CCS is needed for negative CO_2 emissions, which are essential to realise the “well below 2 degrees” vision of the Paris Agreement.

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