ZEP Advisory Council 54

14th March 2018

Agenda Item 6: ERG update

6.a ERG Update

Appended to this paper is an update for the ZEP External Relations Group.

6.b Summary note external meetings

Appended to this paper is a summary note of the external meetings that the Secretariat has participated in:

- **20th February**: EC Scientific Advice Mechanism (SAM) workshop on Novel Carbon Capture and Utilisation Technologies (CCU): Research and climate aspects
- **28th February**: 3rd Meeting of the Commission High Level Group on Energy Intensive Industries

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Agenda Item 6.a: ERG update

ERG Co-chairs: Jonas Helseth (Bellona), Sarah Kempe (Shell)

Weber Shandwick Contract Q1 2018

As stated at the last AC53 meeting, the European Commission has extended the current ZEP grant through to April 2018. This allows the continuation of Secretariat services over this period. It was agreed that any extension to the Weber Shandwick contract would be funded by ZEP-C. The Advisory Council agreed to delegate to the ACEC the decision on arrangements for the provision of Weber Shandwick services for Q1 2018. The ACEC approved the extension to the Weber Shandwick contract on the ACEC January teleconference and the Weber Shandwick service resumed on the 16th January.

External Engagement

Since the last AC53 meeting, the Secretariat has participated in a number of meetings with external stakeholders and processes:

- **20th February** – EC Scientific Advice Mechanism (SAM) workshop on Novel Carbon Capture and Utilisation Technologies (CCU): Research and climate aspects
- **28th February** – 3rd Meeting of the Commission High Level Group on Energy Intensive Industries

A meeting note summarising these meetings can be found as pre-read 6.b.

ZEP Publications

In December, ZEP published the following position paper:

- Funding CCS Market Makers through the Innovation Fund

This paper was developed in response to a direct request from DG Clima and follows on from a ZEP Paper published in March 2016, which provided detailed recommendations for the design of the Innovation Fund Delegated Act.

Media

Editorials

Since the last AC53 meeting, ZEP has published two editorials:

- Article for European Energy Innovation – this editorial was published in December (Winter issue).
- Op-ed for EurActiv – this op-ed was published on the 4th December, to coincide with the publication of the SET-Plan CCS and CCU Implementation Plan.

Furthermore, on the 4th December EurActiv published an article entitled "'Game over' for CCS, driven out by cheap renewables". ZEP developed a response, however the journalist declined to update the article. It was therefore decided to upload the response to the ZEP website instead.

The AC is invited to note these media activities.

Weber Shandwick recommendations for ZEP 2018 Work Plan Q1 - Update

At the last AC53 meeting, a discussion took place on the Weber Shandwick recommendations for ZEP 2018 Work Plan Q1. Some concern was raised with the wording used in the CCU strategic engagement pillar (page 2):

"Continue efforts to ensure that CCU does not become the dominant narrative and that a life-cycle approach is adopted regarding EU funding eligibility of CCU projects."

It was felt that:

- The current wording gives the impression that ZEP does not support CCU, when in fact it has been agreed that CCU should be included within the ZEP narrative.
- A Life Cycle Analysis approach to CCUS projects would require a large amount of resource and with regard to CCU projects, the priority focus is on clarifying the permanence of CO_2 stored.

The Secretariat has therefore developed the following amended wording for the CCU strategic engagement pillar:

"Continue efforts to incorporate CCU within the ZEP narrative (ensuring that this does not become dominant) with a focus on clarifying the permanence of CO_2 stored with regard to EU funding eligibility of CCU projects".

The AC is invited to note this amendment.

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ERG Update

European Zero Emission Technology and Innovation Platform

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Agenda Item 6.b: Summary note external meetings

EC workshop on Novel Carbon Capture and Utilisation Technologies (CCU): Research and climate aspects, stakeholders meeting

Luke Warren attended this workshop on the 20th February.

- The workshop presented the emerging conclusions of a report on CCU developed for the High Level Group of Scientific Advisors under the Commission's Scientific Advice Mechanism (SAM).
- The work was initiated by Commissioner Canete who requested that Commissioner Moedas, who has responsibility for the SAM, ask for recommendations on how to treat CCU. The opinion is expected by the end of April although this may slip by a few weeks.
- The SAM was formed at end of 2015 to advise the Commissioners and is independent to other EC structures such as the JRC. It is made up of seven advisors and uses Science Advice for Policy by European Academies (SAPEA) to bring in specialist advice on topics (SAPEA is a consortium of five scientific academies). Euro-Case led on the CCU work.
- The SAM have been requested to answer two questions:
    - *Under what circumstances CCU for production of fuels, chemicals and materials can deliver climate benefits and what are their total climate mitigation potential in the mid- and long-run?*
    - *How can the climate mitigation potential of CO2 incorporated in products such as fuels, chemicals and materials be accounted for considering that the CO2 will remain bound for different periods of time and then may be released in the atmosphere?*

Presentation and discussion

- Two presentations were made by Elvira Fortunato, SAM HLG, and Marco Mazzotti, ETH Zurich who led on the report.
- Key issues emerging the discussions;

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- CCU could have benefits beyond direct climate mitigation, e.g. providing CCU energy systems services such as grid stability (seemed beyond the scope of the questions asked of the SAM).
- It was recognised that CCU technologies will require large amounts of energy and to deliver climate benefits this will need to be low carbon (largely equated to renewable). Presented data showing that the EU28 have installed 2.5 petawatt hours (PWh) of renewables. They showed scenarios for renewable demand for decarbonising transport via batteries (4.5 PWh), electrolysis derived hydrogen (9 PWh) and synthetic fuels 24 PWh). Therefore 10 x current installed capacity. This is the key challenge for CCU and is aligned with ZEP conclusions.
- To provide quantitative estimates of CCU GHG emissions from cradle to grave requires standardised LCA analysis. Need for EU guidelines for accounting CCU. CO2 Value Europe highlighted the work on CCU LCA being undertaken by the Global CO2 Initiative and implied that the EU should adopt these guidelines.
- There was extensive discussion on the carbon cycle through 9 different CCS and CCU scenarios. Each scenario explored whether these were linear or cyclical and whether they resulted in net emissions to the atmosphere, were neutral or led to negative emissions. There seemed to be rather too much focus on the value of cyclicality rather than net emissions. Again this seemed to go beyond scope.
- The conclusion is that to date most (all?) CCU has a linear carbon cycle leading to a net increase in CO2 emissions. There were only two CCU scenarios that were considered to be cyclical and result in no net increase in atmospheric CO2.
- This then led to an extensive debate on whether the EU should invest in CCU technologies that still emit CO2 and hence ‘use up’ carbon budgets. Some felt that this risked lock in to new emitting processes while other argued that some abatement is preferable and should be pursued as there will be a reduction in CO2 relative to conventional production and processed will improve and change overtime.
- It appears that a core conclusion from the work is that there is not yet the low carbon energy system at the scale necessary or understanding of CCU technologies to be confident that CCU should be pursued rigorously in Europe. There is a need to proceed with a series of pilots and demonstrations to understand the issues better. CCU will be in the R&I space for next 10 – 15 years and priority is demonstrations so that over next 10 years get some real data and are preparing for scalable decarbonisation options for the 2030s.
- It was notable how many Commission officials were present and asking questions on report. This is obviously a substantial topic of debate within the EC. It also highlights the

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independence of the SAM process as the EC officials were also unsighted on the work. DG Clima was very clear on need to understand the costs and LCA impacts. They don't want to make same mistake as with biofuels. Need to understand opportunities and then the EC can think of supporting. Another EC representative questioned whether Europe should be focussing more on the negative emission technologies and saw an opportunity cost if invest in CCU vs negative emission alternatives.

- A representative of the steel industry highlight their carbon to chemicals project which is being proposed in Duisburg. They also raised the perception that there is in-fighting between the CCS and CCU communities and want more advanced collaboration between these sectors. This presented the opportunity from ZEP to highlight that there are likely to be industrial clusters where we will see CCU and CCS synergies and we need to consider the interrelationship between these technologies.
- A representative from Gasunie asked about the opportunity cost of turning H2 into syngas when the hydrogen could simply be used directly. One of the SAM report authors responded about the challenges of using H2 and was not well informed on more recent work on H2. This was countered by ZEP.

Summary

- The overall tone of the discussion was balanced and fairly well aligned with ZEP conclusions.
- It is not clear that the work to date has comprehensively addressed the two questions that were asked of the SAM. There was little discussion on mitigation potential, costs or the period of time that CO2 is bound in products.
- The conclusions seem to be progressing towards the view that CCU currently cannot be pursued at scale given that we do not have a low carbon energy system at the scale necessary to drive the processes. The focus should therefore be on pilots and demonstrations over the next ten years to increase understand on the technologies.
- It seems hard to imagine that – on the basis of the discussions – there would be a recommendation that climate change regulations, e.g. ETS, should be amended now to support delivery of CCU at scale.

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3rd Meeting of the Commission High Level Group on Energy Intensive Industries

Luke Warren attended this meeting on the 28th February.

The High Level Group on Energy Intensive Industries was formed in 2015 to advise the EC on issues relevant to these industries.

- The meeting was opened by Elżbieta Bieńkowska, Commissioner for Internal Market, Industry, Entrepreneurship and SMEs. The Commissioner highlighted the importance low carbon electricity and other low-carbon fuels, e.g, hydrogen for delivering European goals for a competitive, low carbon and circular economy and reducing the 25% of CO2 emissions coming from EIIs.
- She also highlighted three priority topics;
    1. Deployment conditions that can support transition to low-carbon economy while maintaining competitiveness.
    2. Policy options on which decision makers should focus. All energy sectors have prepared 2050 roadmaps and need shared vision. How can sectors work together through the HLG on EIIs?
    3. What financial instruments should be needed, e.g. Multi Annual Financial Framework and others under discussion, e.g. Innovation Fund.
- She also highlighted the Coal transition initiative which is looking to bring instruments to work with coal regions. Also may extend this work to high carbon regions so bring benefits of low carbon economy to wider regions and groups.
- John Cooper presented a paper on behalf of 11 sectors and IndustriAll. Highlighted five key themes for cooperation.
    1. Roadmaps – all sectors working on different roadmaps and need a joined up picture. E.g., all need more availability of electricity, etc.
    2. Policy framework – need long term ambition with deployment of abatement technologies that above cost that EUA market prices can support.
    3. Financing – will hold a discussion on existing instruments and will produce a report on this issue.
    4. Working on social issues with IndustriAll.
    5. Mid-Century Strategies – need a joined up view on this topic.

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- Jos Delbeke – outgoing Director General DG Climate noted that different sectors are developing Mid-Century Strategies and need the EII sectors to deliver on the Paris goals.
- Highlighted that GDP up 53% and CO2 emissions down 23% from 1990 to today – no contradiction from wanting growth and reducing emissions.
- Will have double digit carbon prices in the future – ETS reform kicking off. Highlighted the roll out of carbon markets in China which will soon be twice the size of Europe and prices are already higher in some parts of the Chinese market.
- 500 mn EUA in the Innovation Fund (IF) – at today's price equivalent to €5 bn and the fund is for the private sector to upscale. Previously was for the energy sector and CCS and now for industry to become the major players. Looking at extension of scope e.g. to CCU. Noted also that small and large innovation. Launch IF close to 2020.
- Analysis for Mid-Century Strategy (MCS). Currently preparing the technical analysis for MCS but industries' input is needed. Will have consultation later in year to give your voices.
- Eurofer: identified 12 large scale projects which can deliver carbon neutral steel by 2050. However, need infrastructure and energy supply at competitive prices. Need the right legal framework. ETS – will not deliver today the competitive energy. Cooperating with electricity and hydrogen sectors as need their support. Need new markets for hydrogen, carbon feedstocks (use in chemical industry to produce low carbon products) or CCS. Quite big on CCU opportunity – need funding for this. Made point that Innovation Fund insufficient - €10 bn not enought. All 12 projects would need €10 bn for all to progress – therefore the FP9 must also support. They may need several technologies as some MSs you could use CCS for others it is impossible.
- Cefic: If chemical and iron and steel electrifies then need 5 times Germany's power capacity and need for it to be competitive. Questioned whether time for a Hydrogen Directive, e.g. equivalent to Renewable Energy Directive. Need also to merge energy and industry policy. For CCU need an accounting framework so that can have proper application of CCU. Would look for overlap between circular economy and recycling policies. No mention of CCS.
- Fertiliser sector – need to think about how we use Hydrogem, also carbon storage very interesting. Need help with infrastructure and costs.
- Cembureau – looking at two CCU projects but cannot find funds. Also recognised CCS.
- Sweden – highlighted a steel mill that want to switch from coal to H2.
- FuelsEurope – looking at the future framework, low carbon hydrogen will be aprt of this discussion.

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- CAN Europe – every roadmap should have a clear reference to the temperature goals under Paris. Want the HLG to lead on this. Said that the potential of CCS could be limited and the Commission should be aware of this.
- FuelsEurope – believe that this is becoming more important.
- Austria – made a long intervention on the importance of hydrogen, repurposing the gas grid and green gas. Noted that this needs to be discussed more.

Summary

- There have been questions over how effective the HLG on EIIs has been and its future is not clear.
- There seemed to be change of tone at this meeting and it was quite forward looking with sectors discussing in more detail possible decarbonisation routes. CCS and CCU came up on a number of occasions (previous meetings were notable for these topics not arising).
- The more striking change was the much greater focus on hydrogen from industry, the EC and some member states.
- There was a very unfortunate intervention from an NGO which – either by design or negligence – misrepresented a report on the availability of Negative Emission Technologies (NET) as concluding that CCS had limited potential.
- Following the meeting the joint ZEP EERA paper on the treatment of H2 under FP9 was shared with DG Grow and a correction provided on the NET report.

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