ZEP Advisory Council 54

Meeting Agenda: 14th March 2018

CCAB building - 3.C ALBERT BORSCHETTE, Rue Froissart 36, 1040 Brussels
10:30 – 17:00 CET

Item		Lead Presenter	Time
1	Introduction and welcome: • Adoption of Agenda • Approval of AC53 minutes and review of actions • Chair's update	Graeme Sweeney	10:30 – 11:00
2	Secretariat Update	Luke Warren	11:00 – 11:20
3	Commission updates: • DG RTD • DG ENER • DG CLIMA	 Vassilios Kougionas Vladimir Zuberec Maria Velkova	11:20 – 12:00
4	Overview of European Parliament, Council & other relevant activities	Nikki Brain	12:00 – 12.15
	Lunch		*12:15 – 13:00*
5	Review of Network 2018 Work Programmes Network Policy and Economics update: • PCI & Connecting Europe Facility • Innovation Fund consultation Network Technology update: • TWG Collaboration across the CCS chain • TWG Role of CCS in below 2˚C scenarios • TWG CCU and Sink Factor Methodology	 Lamberto Eldering & Angus Gillespie Filip Neele & Arthur Heberle	13:00 – 14:20
6	External Relations Group (ERG) update	Graeme Sweeney	14:20 – 14:50
7	Norwegian CCS Programme	Trude Sundset	14:50 – 15:35
8	OGCI Clean Gas Project	Concetto Fischetti	15:35 – 16:20
9	CO2 Value Europe	Damien Dallemagne	16:20 – 16:50
10	Any other business & closing remarks		16:50 – 17:00

ZEP Advisory Council 53

Draft Minutes

Attendance

Advisory Council members

Lamberto Eldering	Statoil
Andrea Forabosco (alternate)	Shell
Stuart Haszeldine	SCCS
Jonas Helseth (alternate)	Bellona
Christophe Kervevan (alternate)	BRGM
Pierre Le Thiez	IFP Energies Nouvelles
Filip Neele	TNO
Rob van der Meer	HeidelbergCement
Nils Røkke	Sintef
Graeme Sweeney	ZEP Chairman

Observers and other attendees

Ståle Aakenes	Gassnova
Thomas Berly	IEA
Gerdi Breembroek	ZEP Government Group Registered Observer
Karl Buttiens	Arcelor Mittal
Bor Kae Chang	National Central University, Taiwan
Niels Peter Christensen	Gassnova
Chris Davis	
Caterina de Matteis	IOGP
Bernard Hoffait	Total
Stephen Kerr	Summit Power
Vassilios Kougionas	European Commission
Theo Mitchell	Enerfair
Jean-Xavier Morin	CO2-H2
Brian Murphy	Ervia
Andy Read	ROAD
Annya Schneider	GCCSI
John Scowcroft	GCCSI
Henry Smyth	Ervia
Jan Steinkohl	European Commission
Keith Whiriskey	Bellona
Maria Velkova	European Commission
Vladimir Zuberec	European Commission

ZEP Secretariat

Nikki Brain	ZEP Secretariat
Luke Warren	ZEP Secretariat

Item 1: Introduction

ZEP Chair Graeme Sweeney (GS) introduced the meeting. The AC adopted the agenda for the meeting and approved the minutes of AC52. The AC endorsed the actions taken by the ACEC on its behalf since the last AC meeting.

Chair's update

GS said the SET- Plan Implementation Plan for CCUS had now been approved. GS said it was disappointing that none of the approved Implementation Plans were presented at the SET Plan conference in Bratislava. GS said the Temporary Working Group 9 had permission to reform as a Temporary Standing Group, before the Commission sets out how the plans will be advanced. The standing group will meet in January.

GS fed back that all four PCI applications for CO2 transport had been approved.

GS said that Patrick Child, Deputy Director- General DG RTD, had invited ZEP to provide input on the Missions for FP9. DG CLIMA had invited ZEP to input into the Commission's revised 2050 decarbonisation Roadmap, and to provide a proposal on how to fund a CCS "Market Maker" through the Innovation Fund.

GS said ZEP and the CCSA had jointly submitted a letter to the Norwegian Government in light of the budget announcement. A formal response was not received, but Norwegian stakeholders had found the demonstration of interest outside Norway to be helpful.

Item 2: Secretariat update

Luke Warren (LW) fed back on the actions from AC 52. LW had set a date to contact the Commission about the Clean Energy Ministerial. All other actions had been completed.

LW shared the financial update and confirmed that 2018 would return the ZEP budget to a surplus. He said that the Commission had approved the extension of the Secretariat's grant to April and an amendment to the grant has been submitted to the Commission for formal approval.

The Secretariat proposed an approach to the 2018 budget in light of the grant extension. The AC approved the draft budget for core services presented by the Secretariat. The AC agreed to the proposal that the ACEC manage arrangements for the provision of the Secretariat and Weber Shandwick services in Q1 of 2018.

The finance paper was approved.

Item 3: Commission updates

DG RTD

Vassilios Kougionas (VK) thanked those who had worked on the SET- Plan Implementation Plan, allowing it to be approved by the Commission. He said the January meeting of the Working Group should look at how the actions align with Mission Innovation.

VK thanked Filip Neele, Nils Røkke, and Wim van der Stricht for representation at the Mission Innovation meeting in Houston, and for ZEP's role in establishing a common EU position ahead of the talks. VK said that while the focus had initially been on low TRL technologies the focus was shifting, with the US Department of Energy willing to discuss higher levels.

Nils Rokke (NR) said instruments needed to be created to enact the activities identified under Mission Innovation, and that these should align with the SET- Plan. NR said that the EERA-ACT framework would hopefully expand globally and could align with the Missions. However the next round of funding will not be supported by the Commission so will be reliant on funding from member governments.

Stuart Hazeldine (SH) said the focus from the CCU delegation at Mission Innovation was strongly on economic opportunity as opposed to CO_2 mitigation, and he suggested that the EU should take a stance to counteract this.

VK said that the proposals for FP9 were being developed based on recommendations contained in the Lamy report on innovation including a doubling of the innovation budget and a missions- based approach. VK said there would be a public consultation in January, and proposals would be sent to the Parliament and Council by the end of May 2018.

NR said there seemed to be confusion between system TRL and component TRL. It was agreed ZEP should produce a short paper to differentiate these in relation to CCUS in the context of FP9. NR said that ZEP and EERA were working on joint input on definition of Missions under FP9.

DG ENERG

Vladimir Zuberec (VZ) said he had taken over from Michael Schuetz on an interim basis to be ZEP's key contact within DG ENER, alongside Jan Steinkohl.

VZ fed back on the meeting of the Project Network Advisory Forum in October which discussed bridging the gap between the previous NER 300 projects and the Innovation Fund to 2020 The Forum heard presentations from ROAD, GCCSI and a discussion on the future of the Network. Feedback was that the Network should focus on business and deployment and avoid duplication of the activities of other organisations. VZ agreed to circulate the minutes of the meeting when available.

DG CLIMA

Maria Velkova (MV) gave an update from CLIMA in light of the agreement on ETS. Important additions were the inclusion of CCU in the text, and the delegated act for the Innovation Fund. The

inclusion of milestone funding and flexibility on the percentage of project costs eligible is welcome in the context of CCS. MV said there would be a public consultation on the Fund in the New Year, and that an expert group would also be set up as this is part of the formality of creating a Delegated Act. MV said there would be an application process if the expert group is open to stakeholders.

MV said CLIMA wanted the Fund to be operational by 2020, as the second round of NER 300 funds would be reallocated early. On the Modernisation Fund, MV said that while CCS was eligible the Member States applying for the Fund would be unlikely to use it for this purpose, and that there could be a role for ZEP to engage with them on this.

MV said that there had been a statement from the Commission that CCU would not be counted under the ETS until phase 5 (2028 onward).

MV said the CLIMA study on CCU technologies would conclude in June 2018, with workshops being held on 1 March and 20 April.

MV said the Scientific Advice Mechanism would provide a separate, independent opinion in April 2018. MV said the Terms of Reference are available on the SAM website.

LW asked MV about the invitation from Artur Runge- Metzger to input into CLIMA's 2050 pathways work and how best to input. MV suggested sending input directly to the head of the Strategy unit.

Item 4: Overview of European Parliament, Council & other relevant activities

Nikki Brain (NB) gave an overview of developments in the European Parliament and Council on various parts of the Clean Energy Package.

On Governance of the Energy union, NB said the ERG had produced a short paper aiming to strengthen the language around 2050 targets in the Council's proposed text.

On Electricity Market Design, NB said the Council and Parliament both retained the Emissions Performance Standard of 550gCO2/kWh but that the Council had proposed delaying implementation until seven years after the implementation of the Directive, while the ITRE Committee proposed shortening this to two years.

NB said that ZEP's recommendation to include biomass with CCS within the Renewable Energy Directive was reflected in the Council's revised text.

On CCU, NB said the final position was not clear given the negotiations were ongoing, but that ENVI had several new definitions for CCU fuels within its text with different criteria, which made the issue more difficult to follow. NB said the Council retained the recommendation for a 70% emissions saving to be the threshold for eligibility, and that the Council advised that Member States should retain choice over whether to include these fuels in their supplier obligations.

Item 5: Ervia, Cork CCS project

Henry Smyth (HS) gave an overview of Ervia's proposed power project delivering CCS on two new CCGTs located near Cork (see presentation slides). He said the project aimed to use existing infrastructure including the Kinsale gas field which is due to be decommissioned in 2022. The field has been used for gas storage meaning it is already capable of two way flow, and is low pressure. HS said this would decrease CAPEX and OPEX.

HS said the CCGTs could be the anchor load for an industrial cluster in the region encompassing the Irvine oil refinery, local industrial emitters and BECCS.

HS said that Ireland would not develop the project in isolation; it was envisioned as a project by Europe for Europe. Ervia are hoping to apply for innovation funding once the Fund is open. National support would also be needed, including the project forming part of Ireland's National Integrated Plan.

It was agreed that it would be useful for Ireland to participate in the forward work of the SET- Plan Standing Group, and that ZEP should attempt to facilitate this.

Item 6: BRGM, CO2 DISSOLVED

Christophe Kervevan presented on BRGM's CO2 DISSOLVED project which looks at the potential to combine injection of CO2 dissolved in brine and extraction of geothermal heat (see presentation slides). KC said that the heat recovered strengthens the economic case for the CCS project by selling the heat to local heat networks. The dissolution of CO2 in brine potentially makes the storage safer as there is no pressure build up or brine displacement associated with traditional CO2 storage. However this option would only be viable for small-to-medium size emitters.

BRGM hope to continue the work with a pilot and are looking for a location. They are also undertaking work on social acceptance of this type of storage.

Participants asked what the status of CO2 in this form would be under the CCS Directive. CK said this needed further investigation.

GS said the project would be well placed within the SET- Plan action on innovative onshore storage pilots.

Item 7: Summit Power, UK East-Coast Economic Benefits CCS

Stephen Kerr (SK) presented a report from Summit Power which sets out in economic terms the benefit of CCS to the UK, using the methodology the Treasury would apply to other large infrastructure projects. The report demonstrates that the business case for industrial CCS and power CCS together is stronger than that for either alone. SK said that the report demonstrated the benefits significantly outweigh the cost (see presentation slides).

Stale Aakenes asked about the figures on storage options contained in the report. SK said these reflected the fact that the UK could develop its own stores on a regulated basis to control costs, as opposed to paying an unknown cost to another party for storage.

Thomas Berly (TB) said the study was helpful and that “best practice” common methodology for defining value of infrastructure should be developed by governments.

Item 8: Networks update

Network Technology

Filip Neele (FN) outlined Terms of Reference for three new Temporary Working Groups for approval by the AC. The first, a TWG Mission Innovation, would continue to work with the Commission on the Missions Innovation process and feedback on the forthcoming MI report. FN said the TWG would also lead ZEP’s input into the FP9 development process including working with EERA to draft suggested missions.

FN said the second TWG on “Collaboration across the CCS chain” would focus on managing storage obligations and liabilities; would support the work being done by ERA-NET ACT projects ELEGANCY and ALIGN-CCUS on managing the CCS chain, particularly in clusters with multiple emitters and storage sites.

Finally, the ToR for a TWG CCS in a 2 degrees scenario was presented, to build on previous work by the IEA and incoming IPCC work and tailor recommendations for a European context.

All three Terms of Reference were approved by the AC.

In addition, Rob van der Meer (RvdM) introduced the concept for a fourth TWG, to build on ZEP’s recent report into CCU and energy intensive industries. RvdM said that the work would focus on collating Life Cycle Analysis from several industrial projects and presenting this in a uniform comparison. RvdM said the Arcelor Mittal and Mitsubishi would support this piece of work.

It was agreed that a short Terms of Reference would be sent to the ACEC for approval in January to allow the work to commence.

Network Policy & Economics

Lamberto Eldering (LE) presented the NWPE forward work programme, including an updated Terms of Reference for the TWG PCI. This was approved by the AC.

Theo Mitchell (TM) introduced for approval a paper from TWG Innovation Fund, which was produced in response to DG CLIMA’s request for a proposal on how to fund a CCS market maker through the Innovation Fund. The paper was approved by the AC.

NR asked how the Network would input into the work of TWG9. LW said the Secretariat had a call with the TWG9 co-chairs, and the group plans to invite experts on each R&D activity to review the actions outlined in the Implementation Plan.

Item 9: External Relations Group (ERG) update

Jonas Helseth (JH) said that Mark Downes had stepped down as co-chair of the ERG, and that Sarah Kempe, EU Affairs Adviser at Shell, had been proposed as the new co-chair. GS asked for any further nominations, of which there were none. The AC approved the nomination.

LW gave feedback on the hydrogen workshop held with the European Commission in November. Participants included DG RTD, including the Hydrogen and Fuel Cell Joint Undertaking; DG ENER, and Hydrogen Europe. LW said there was general consensus that the groups should cooperate more closely, and a follow- up call was scheduled for December to see if a proposal could be put to the Commission on including CCS in its hydrogen work in future.

LW fed back on the CSLF meeting held on 6 October, which was hosted by CCSA and CO2GeoNet and supported by ZEP. LW said that there had been strong views presented by the panel, with five key messages being sent on to the Secretariat to be incorporated into the message for ministers.

Item 12: Any other Business and closing remarks

RvdM said that there had been a meeting in Sydney on standardisation of CO2 capture in the cement industry. JH said that standardisation of CO2 purity can act as a barrier to projects. FN said TNO had also been contacted on this subject. It was agreed this issue could be brought up at the next Network Technology meeting.

GS said that ZEP had offered to help North Rhine Westphalia with regional modelling, which would reflect the priority focus on supporting Member States, infrastructure development and PCIs.

Actions

Action		Owner	Deadline
3	ZEP to produce a short paper to differentiate between system TRL and component TRL in relation to CCUS in the context of FP9		
3	VZ agreed to circulate the minutes of the meeting when available.	Vladimir Zuberec	
5	Ireland to be invited to the SET-Plan Standing Group	Secretariat	
8	Terms of Reference for TWG CCU to be sent to ACEC for approval in January	Rob van der Meer	

Advisory Council Executive Committee
Minutes: Conference Call – 16th January 2018

Attendance

Graeme Sweeney	Ardnacraggan Energy Services Ltd. (Chair)
Rob van der Meer	Heidelberg Cement
Arthur Heberle	Mitsubishi Hitachi Power Systems
Theo Mitchell *	Enerfair
Marie Bysveen*	Sintef
Luke Warren	ZEP Secretariat
Harriet Howe	ZEP Secretariat

* Theo Mitchell acted as Frederic Hague's proxy; Marie Bysveen acted as Nils Røkke and Charles Soothill's proxy

1. Introduction and general update (open session)

Introduction & actions from last meeting

The January meeting agenda was adopted.

Graeme Sweeney (GS) updated the ACEC on the upcoming SET-Plan Working Group 9 meeting, taking place on the 30th January in The Hague. Harriet Howe (HH) added that representatives from the Croatian Government and the Port of Rotterdam Authority had also been invited to the meeting, following discussions at the AC53 meeting in December.

2. Network and Temporary Working Group updates (open session)

a. Network Technology

Arthur Heberle (AH) gave an update on the Network Technology and the three new temporary working groups, established at the meeting in October and approved at the AC53 in December.

GS had received a request from a representative at Shell who wished to be put into contact with a CO_2 transport expert from the NWT. GS agreed to pass on details to AH.

Draft terms of reference for a new TWG were circulated to the ACEC in the pre-reads, and will now be presented at the AC54 for approval.

TM informed the ACEC that Rambol are the principle consultants delivering a CCU project for the Commission. TM agreed to send details to Rob van der Meer who is chairing the ZEP TWG.

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Marie Bysveen (MB) gave an update on draft proposals for FP9, informing the ACEC that the Commission had been presented with the draft CCS Mission, co-badged as EERA and ZEP. EERA had not received many submissions for other technologies and so MB proposed that rather than wait, ZEP submit CCS proposals separately through other channels. GS noted that ZEP had been asked by Patrick Child for input on a CCS Mission under FP9 and would present the current proposals.

b. Network Policy and Economics

As neither of the NWPE co-chairs were on the call Luke Warren (LW) gave an update on recent activities.

The Secretariat had received an email from Maria Velkova (DG CLIMA) informing that a public consultation on the design of the Innovation Fund has now been launched.

The Secretariat has an upcoming meeting with Tom van Ierland (Head of Unit, Strategy and Economic Assessment, DG CLIMA) regarding the Commission's mid-century strategy, in order to better understanding the process and how ZEP can contribute. An invitation had also been extended to the unit to present the mid-century strategy at the upcoming NWPE meeting.

The Secretariat has reached out to the Port of Rotterdam Authority inviting a representative to take up the position of co-chair for TWG Policy and Finance. TM informed the ACEC that he and Keith Whiriskey had followed up with Mark Driessen, who had been keen to not replicate work, but now seemed positive about contributing. GS informed the meeting that the PoR were still waiting to see if there would be an opportunity to recycle funds from ROAD before they clarify their roadmap. Additionally, the PoR feel that there is not currently much connectivity between the project and the PCI and that the TWG Policy and Finance is a good opportunity to establish this.

TM took an action to follow up with Tim Bertels to understand what advice the Port of Rotterdam Authority may need from ZEP, and LW took an action arrange a follow up meeting with the PoR.

TM informed the ACEC that he would be taking over responsibility for TWG Policy and Finance whilst Jonas Helseth is on leave.

There was a discussion on the Multi Annual Financial Framework consultation, with a suggestion that the ZEP consider putting together a response. TM took an action to follow up on this and look into potential links with FP9.

c. ERG

As neither of the ERG co-chairs were on the call Luke Warren (LW) gave an update on recent activities.

LW updated on planned meetings with Damien Dallamagne from CO_2 Value Europe, Fuels Europe and DG GROW. The Secretariat is still awaiting a response from Hydrogen Europe about a

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possible meeting at the end of January. The ACEC were informed that the next engagement programme will be delayed until March.

There was discussion of the 'Game over for CCS' article, published by Euractive in December. ZEP has offered to have a briefing session with this journalist and is awaiting confirmation.

3. AC54 agenda

It was agreed that as it has been difficult to find suitable dates for the ZEP-C AGM in the past, this should be held on the same day as the AC54.

LW proposed that Network updates be brought forward to an earlier time slot for the AC54 meeting so that they could be more closely linked to policy discussions. It was agreed that presentations from external speakers could be moved to the afternoon session.

The UK Department for Business, Energy and Industrial Strategy will present an update. GS asked if the Norwegian Government could also be invited to provide an update. TM also took an action to follow up on the invitation to INA regarding their BECCS projects.

4. Finance update (closed session)

2017 finances have been finalised and passed to the auditor. LW agreed to present an overview at the AC54 meeting.

The Commission grant has been extended to the end of 2018. Core services for ZEP-C would be extended over the first quarter; however this would not be possible for the Weber Shandwick contract. As there was not a core-eight of ACEC members on the call to agree a decision and so LW agreed to circulate a proposal on how to manage Weber Shandwick services, with a deadline to take views by end of business that day.

5. AOB

No other business was raised.

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6. Actions

Action		Owner
2.a.	GS took an action to forward contact details of the Shell representative looking for a CO_2 transport expert to AH	GS
2.a.	TM to send details of consultants leading on Commission CCU work to RvdM	TM
2.a.	NWT chairs/MB to share FP9 response with the Commission before final draft submitted	MB/NWT co-chairs
2.b.	TM to contact Tim Bertels for details on connectivity between PCI and PoR project, and on support needed from ZEP	TM
2.b.	LW to arrange follow up meeting with PoR on funding	LW
2.b.	TM to update on possible ZEP response to MFF consultation at next ACEC call	TM
2.c.	HH to find new dates for a possible meeting with Hydrogen Europe	HH
3.	LW to invite the Norwegian Government to present an update at the AC54	LW
3.	TM to follow up on AC54 invite to INA	TM
4.	LW to send WS work programme proposal to ACEC for approval	LW

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Advisory Council Executive Committee
Minutes: Conference Call – 15th February 2018

Attendance

Graeme Sweeney	Ardnacraggan Energy Services Ltd. (Chair)
Filip Neele	TNO
Jonas Helseth	Bellona
Nils Røkke	EERA
Gardiner Hill	BP
Luke Warren	ZEP Secretariat
Harriet Howe	ZEP Secretariat

* Jonas Helseth acted as Frederic Hague's proxy

1. Introduction and general update (open session)

Introduction & actions from last meeting

The February meeting agenda was adopted.

HH gave an update on the SET-Plan Implementation Working Group 9, including the outcomes of the meeting, which took place on the 30th January in The Hague.

GS added that the Commission had invited the IWG9 co-chairs to put together a proposition for a future 'Coordinated Support Action' to be funded through H2020. He added that this would be a good opportunity to get a clear separation of duties between the ZEP Secretariat and a future CSA, with a greater emphasis on communications. LW added that the other 2 co-chairs, representing Norway and the Netherlands had communicated that they were happy with ZEP's involvement and would support a continuation of the existing structure.

NR raised the potential risk of delaying action until financial support for a CSA is in place, which could take a year. NR has raised this matter with the Norwegian Government and asked whether ZEP should also engage with the Norwegian and Dutch Governments to see if they are able to contribute financial or staffing resources to address this. The Secretariat took an action to assess options for CSA funding in the short term, including potentially through InnovFin.

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2. Network and Temporary Working Group updates (open session)

a. Network Technology

FN gave an update on the Network Technology, including arrangements for the NWT meeting taking place on the 22/02 in Brussels.

Work under the TWG Collaboration across the CCS chain, chaired by Ward Goldthorpe, is progressing well, with a kick-off teleconference scheduled that afternoon. The timeline for delivering the final report is likely to be the end of the year, with preliminary results available in early summer.

Charles Soothill has agreed to chair the TWG Role of CCS in below 2 degrees scenarios, which would be shared between both ZEP Networks and will link European modelling results with communicating the need for CCS. This work will reference the EU mid Century Strategy, with GS noting that this piece of work could be useful in influencing the process.

There was a discussion on the scope of the TWG. It was agreed that the report should take into account the wider CCS value proposition, including air quality and public health, clean hydrogen employment, industrial competitiveness, transition of low carbon regions.

JH gave an update on progress of the TWG CCU and sink factor methodologies. Two other CCU projects are currently underway; one lead by the consultants Rambol of behalf of the Commission, and the second by CO_2 Value Europe. The chair of the TWG Rob van der Meer had agreed that work under the ZEP TWG should be delayed until there was clarity on these projects in order to avoid any potential repetition.

The Mission Innovation report is expected to be published in late February/March. An early draft of the report has been circulated but FN and NR do not have access to a copy. NR took an action to try and obtain a draft copy of the report.

The ACEC were invited to provide comments on the clean hydrogen recommendations for FP9, which was circulated with the pre-reads. It was agreed that there should be no distinction between the different hydrogen pathways, and the terms green and clean hydrogen should be replaced with ‘sustainable hydrogen’. HH took an action to update the text accordingly.

GS added that efforts to engage with Hydrogen Europe had been unsuccessful, but that he would continue to try and arrange a meeting and get endorsement of ZEP’s approach to clean hydrogen.

Draft FP9 CCS Missions have been circulated for comment to NWT co-chairs, GS and NR. It was agreed that once amendments had been made the NWT could endorse the recommendations to be taken forward. FN and HH took an action to include FP9 on the agenda for the upcoming NWT meeting.

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b. Network Policy and Economics

JH gave an update on the NWPE, including outcomes from the meeting held on the 29th January in Brussels. There were particularly constructive discussions around the PCIs projects, including whether the list could be adapted, with the Commission responding that they plan to be flexible on this.

The deadline for the Innovation Fund consultation is April, with a teleconference planned for next week led by Theo Mitchell. JH noted that once a ZEP position is in place it will be important to seek the wider views of the Platform.

JH has engaged further with the Port of Rotterdam Authority regarding the co-chair position for TWG Policy and Finance. Mark Driessen has stated his interest in taking up the position at a later date and JH informed the ACEC that he would reengage on this issue in the coming months.

There was a discussion on the ZEP offer to conduct modelling on behalf of North Rhine Westphalia, and the associated costs of the activity. The Secretariat took an action to arrange a call between GS, JH, and Charles Soothill to progress these discussions.

There was a discussion of InnovFin and potentially opportunities for CCS funding. A question was raised over how ZEP could open up these funds, potentially with support from Member States and in particular the IWG9 co-chairs Norway and the Netherlands. GH added that OGCI will be setting up a workshop on this topic and agreed to keep ZEP involved. The Secretariat took an action to arrange a call between LW, JH and GS to discuss the politics of InnovFin and next steps.

c. ERG

LW gave an overview of the January external engagement programme, including meetings with CO_2 Value Europe (COVE) and Fuels Europe and Concawe. LW informed the ACEC that discussions with COVE had been constructive, with them viewing CCU as complementary to CCS and stating that they will only support initiatives which lead to CO_2 abatement.

LW and GS attended the Port of Rotterdam Energy in Transition event in Brussels, where there was a strong focus on CCS as part of plans for industrial decarbonisation. GS noted that there seemed to be a lack of ambition and clarity from the Commission. This sentiment was also shared in the meeting with Fuels Europe, who plan to release their vision for the future of fuels in a low carbon economy in April.

3. AC54 agenda

LW updated the ACEC on changes to the AC54 agenda since the January ACEC call. Trude Sundset from Gassnova will provide an update on the progress of the Norwegian CCS projects. The UK Government have also been invited but are unable to send a representative to give an update. There had been no response from the Port of Rotterdam Authority, but LW plans to contact Joelle Rekkers from the Dutch Government to present at the meeting.

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There were suggestions to invite COVE and the Clean Gas Project to present to the AC. LW took an action to invite the Clean Gas Project to the AC54 meeting.

JH has followed up with INA regarding the Croatian CCS project, which has been delayed as new technology providers are sought. It was agreed that INA should be invited to present at a later AC meeting.

GH asked whether a representative from the US Government could be invited to give an update on recent legislative changes affecting CCS. LW took an action to follow up with the US Energy Attaché in Brussels to discuss this further.

4. AC membership

A pre-read was circulated ahead of the meeting listing AC members who have not attended meetings over the last 18 months. LW informed the ACEC that Benjamin Dennis from the ETUC had previously shown interest in joining the platform and should be contacted as a potential replacement to the current ETUC representative.

There was a discussion on the current lack of a representative from the equipment manufacturer group. LW took an action to contact EPPSA for their views. GS informed the ACEC on previous engagement with Siemens and it was agreed that there should be a follow up to gauge their interest in participating in the Platform. There was also a discussion on engagement with Vattenfall, which the ACEC agreed to raise with Lamberto Eldering on the next call.

5. Finance update (closed session)

LW gave a summary of ZEP finances. The ZEP-C AGM will be held during the morning session of the AC54, where the budget will be presented for approval.

6. AOB

GH gave an update on the recent CSLF meeting, noting that it was well attended and that a number of countries had been accompanied by industrial representatives. GH enquired if ZEP could take on this role for the Commission, for example at the Clean Energy Ministerial in May. It was agreed that the Mission Innovation process had set a president for this.

A Scientific Advisory Mechanism report on CCU is currently being drafted, with a stakeholder consultation on the draft report planned for the 20th February. JH will be attending as a representative of Bellona and LW took an action to seek an invitation for a ZEP representative to attend.

The Secretariat took an action to circulate a poll to find alternative dates for the April and May ACEC calls.

GS informed the ACEC that Angus Gillespie will be stepping down from his position at Shell. GS took an action to follow up with Shell on who would be their replacement AC candidate.

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7. Actions

Action		Owner
1.c	Secretariat to assess options for CSA funding in the short term, including through InnovFin.	Sec
2.a.	NR to try and get copy of draft Mission Innovation report	NR
2.a.	HH to update recommendations for clean hydrogen under FP9 with comments from the ACEC	HH
2.a.	FP9 to be included on the agenda for the NWT meeting	FN/HH
2.b.	Secretariat to arrange a call between GS, JH, and Charles Soothill to discuss funding NRW modelling	Sec
2.b.	Secretariat to arrange a call between LW, JH and GS to discuss the politics of InnovFin and next steps.	Sec
2.c.	LW to invite the Clean Gas Project to present at the AC54 meeting	LW
3.	LW to follow up with the US Energy Attaché in Brussels to discuss recent CCS updates.	LW
4.	Sec to contact Benjamin Dennis at ETUC as a potential replacement to existing AC representative	Sec
6.	LW to follow up on an invitation for a ZEP representative to attend the CCU workshop.	LW
6.	Secretariat to circulate a poll to find alternative dates for the April and May ACEC calls.	Sec
6.	GS to follow up with Shell on the replacement AC candidate for Angus Gillespie.	GS

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14th March 2018

Agenda Item 1.e: Chair's update

External meetings

The ZEP Chair has participated in a number of meetings with external stakeholders and processes since the last AC53 meeting:

6th March

- **Elise van Gerven** and **Kelsey van Maris**, Energy Advisers, Cabinet of Bart Tommlein, Flemish minister for the Budget, Finance and Energy

23rd January

- **Damian Dallemagne,** Acting Executive Secretary & **Jean-Yves,** Tilquin Vice-President, CO2 Value Europe.
- "Energy in Transition" – Port of Rotterdam Authority event.

24th January

- **John Cooper**, Director General & **Alessandro Bartelloni**, Policy Director, FuelsEurope.
- **Tom Van Ierland**, Head of Unit CLIMA.C1 - Strategy and Economic Assessment.
- **Maria Velkova**, Co-ordinator NER300 & **Petra Sarapatkova**, InnovFin EDP, DG Clima.

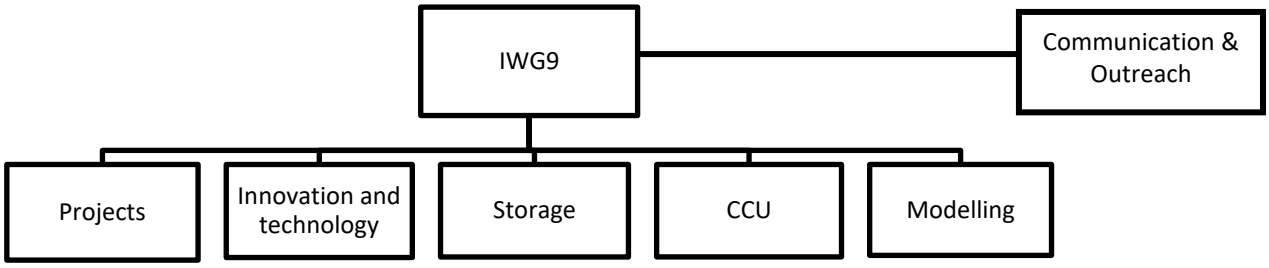
A summary of these meetings can be found as pre-read 1.e.I.

SET-Plan IWG9 CCS and CCU update

The first meeting of the SET-Plan CCS and CCU Implementation Working Group (IWG) took place on 30th January in The Hague. Minutes from the meeting are appended as pre-read 1.e.II. Jose Jimenez Mingo, head of the SET-Plan team, provided an overview of the Commission's perspectives on next steps and Horizon 2020 funding for a 'Coordination and Support Action' (emphasising that this should not be referred to as a Secretariat).

A call will be launched in May this year for a €1 million CSA grant, which could be supported by a consortium, with a legal entity to manage the budget. It was advised that a consortium approach should avoid involving too many different groups and would be preferable for interested parties to align and develop a single proposal ahead of the call. The IWG Co-Chairs took an action to draft a proposition outlining the core services required to be shared with Member States. The CSA will also be responsible for coordinating engagement and outreach activities for the IWG9 once a grant is in place. Cooperation with other SET-Plan Action groups may also be embedded as a condition of the grant.

Work under the individual R&I Activities will be progressed by sub-groups, which will hold more frequent teleconference meetings and will be established once CSA services are in place. The provisional structure of these subgroups is shown below:



The IWG9 Co-chairs, ZEP Secretariat, EERA, and the Commission will meet on the 14th June in Brussels to discuss strategy and next steps.

The next IWG meeting will be held on 20th September in The Hague.

ZEP External Engagement

On Tuesday 23rd and Wednesday 24th January, Graeme Sweeney, ZEP Chair and Luke Warren, ZEP secretariat attended meetings with CO_2 Value Europe, FuelsEurope / Concawe, DG Climate Action on the Mid-Century Strategy and DG Climate on InnovFin EDP funding for CCS.

They also attended the Port of Rotterdam's Energy in Transition workshop hosted by Allard Castelein.

On 6th March Graeme Sweeney, Jonas Helseth, Bellona, and Nikki Brain, ZEP Secretariat met with Kelsey Van Maris ad Elise Van Gerven, Energy Advisers to Bart Tommlein, Flemish Minister for the Budget, Finance and Energy.

The notes below summarise the discussions and key actions arising.

CO_2 Value Europe

- Attending from CO2 Value Europe (COVE): Jean Yves Tilquin – Carmeuse & Vice-President, Damien Dallemagne – Secretary General (acting) and Landry Cochard – Senior Advisor.
- Jean Yves has worked extensively on CCS and more recently on CCU, he worked with Damien to launch the SCOT project which was completed June 2016. SCOT led to the establishment of COVE in response to an EC request for the CCU community to collaborate and help EC thinking on the subject. The organisation will work on technical matters and policy / advocacy.
- COVE is in the process of recruiting a Secretary General and so Damien and Landry are likely to move on once the new secretariat is in place. Currently there are around 50 organisations that are members of COVE and the organisation was officially constituted on the 30th November 2017. Its current President is Dr Stefanie Kesting, Uniper.
- COVE were very interested in ZEP structures and activities and were keen to understand how CCS can come back onto the agenda and become relevant for industrial emitters. They were interested and agreed with the ZEP narrative on the public goods view of CO_2 infrastructure.
- COVE was also very clear that they see CCU as an addition to CCS and not a replacement technology. They also understood that the relative role of CCS is expected to be greater than CCU.
- COVE see the primary objective of CCU as C-abatement and this is stated in their charter. They also differentiated between 'smart CCU' and 'stupid CCU' and are concerned about potential reputational risk if CCU is seen as 'greenwash'.

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- COVE are keen to develop a roadmap with external partners, potentially including SPIRE, Hydrogen Europe and ZEP.
- It was recognised that there ZEP and COVE have similar objectives and it was important to continue these conversations on how the organisations can work together in future. There was interest in exploring the potential to collaborate around any bid for the SET-Plan Action 9 support under H2020.
- In summary, the meeting was constructive and it seemed valuable for both ZEP and COVE to understand more about each other's organisations and priorities. There also appears to be – at least at a high level – excellent alignment between the organisations, e.g. both focussed on C-abatement and see the technologies being complementary. It was agreed to continue collaboration between the two organisations.
- Action: It was agreed to investigate how ZEP and COVE could build on the collaboration between the organisation that has taken place under the SET Plan TWG-9.

Port of Rotterdam: Energy in Transition

- The workshop was an evening event hosted by Allard Castelein, Port of Rotterdam President and Chief Executive Officer and ZEP AC Member.
- The workshop was an opportunity to introduce the pathways work undertaken by the port on energy transition pathways that can enable the industries located to contribute to the delivery of the Netherlands climate targets.
- The workshop was pitched as a broad industrial decarbonisation discussion in which a wide range of technologies are expected to make a contribution. However it was also made clear that CCS is an essential technology to contribute to decarbonisation and CCS discussions were a prominent part of the event.
- Allard set out the port's vision to become "the European" industrial region and how they wish to enable CCS. Specifically supporting the development of infrastructure that can be accessed by emitters capturing their CO_2 on an open access, non-discriminatory basis. They estimate that transport and storage infrastructure can be delivered for \$20 – 30 tCO_2.
- They are currently working with 10 organisations on this initiative and are also engaging with the new Government. They are also looking at synergies with the Port of Antwerp and have a goal of storing 4 – 5 $MtCO_2$ by 2030.
- In the subsequent discussions Dominique Ristori, Director General for Energy, spoke and highlighted the importance of PCIs for CCS, the SET-Plan CCUS activities and the opportunity for H2020 and Innovation Fund to support CCUS projects. Mechtild Worsdorfer, Director, DG Energy, noted the challenges arising from limited Member State activity on

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CCS but believed that it will come back onto the agenda given that the evidence shows CCS to be important to realising climate goals.

FuelsEurope and Concawe

- Attending: John Cooper – Director General, Alessandro Bartelloni – Policy Director, Robin Nelson – Science Director & Damien Valdenaire – Science Executive.
- FuelsEurope and Concawe are considering the role CCU and CCS technologies within a broader strategy the future of the downstream oil and gas sector. They have a CCS TF focussed on understanding the opportunity of retrofitting CCS to refineries and considering next steps. CCS seen as an important part of the future.
- Want to know how they can position themselves in the technology debate, want to engage with ZEP in this area. They were very interested in the SET-Plan process and understanding how they can engage in this in future.
- They are working on a strategy on the future of the industry and believe that many new interesting options for low and zero carbon fuels for the long term, e.g. biomass, H2, advanced biofuels, synthetic fuels, etc seen as complementary to electrification.
- Noted that the EU ETS has done nothing, it is high enough to be a cost but too low to make a difference and support investment.
- Currently developing new narrative which will be released in April set out the vision for the future of the industry. They will also be working on the political vision and policy framework to deliver and don't yet know all the answers. The challenge is how to move from the first projects, supported by the ETS through the innovation fund to a roll out of CCS that ETS derived instruments will not support.
- Very interested in life-cycle analysis of CO_2 derived fuels, want to get clarity on the way forward and get it right from the beginning. They were also very interested in the hydrogen story, particularly the work being done on hydrogen and heating and the implications this could have for transport sector. RED has price signals around it and car industry action at c.$200 - 300 tCO2. Is there a way in which low carbon fuels can be supported under a similar structure?
- Challenge is that industry is undertaking some excellent work and understanding options however there is disconnect between these options and the downstream regulation which is being imposed - often at significant costs – on consumers.
- ACTION: LW to send ME5 report to help inform their modelling work.

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- ACTION: Following the release of the vision on the future of fuels in a low-carbon economy it was agreed to discuss opportunities to collaborate on EU policy and technology programmes.

DG Climate Action, Mid-Century Strategy

- Attending: Fabien Ramos & Kostis Sakellaris – DG Climate Action, Unit C1 – Strategy and Economic Assessment.
- The Strategy and Economic Assessment is a 'horizontal unit' that leads on DG Climate's technical and analytical work (e.g. it is responsible for most of their Impact Assessments).
- In 2011 the Commission released *A Roadmap for moving to a competitive low-carbon economy in 2050* in order to;
    - Support the development of long-term strategies to deliver 2050 climate goals
    - Provide guidance on how the transition can be achieved in the most cost-effective way.
    - Give insights on which technologies and actions are required
    - What policies need to be developed over the next 10 years and beyond.
- The context for the 2050 Roadmap was an 80% emission reductions leading to carbon neutrality in the power sector and lots of electrification in heating and transport. The 2050 Roadmap was very positive on CCS and foresaw substantial deployment in the power and industrial sectors.
- The work on the Mid-Century Strategy (MCS) responds to the Paris Agreement decision which invites Parties to submit, by 2020, long-term, low GHG development strategies. This raises possible implications (not explored in the meeting) on how EU assumptions and pathways might impact on other Parties' strategies.
- The MCS represents the start of a new cycle which will influence EC approaches to decarbonisation. This will be a technical analysis that takes account of current climate science and updated views on technology. There will be some new focuses relative to the 2050 Roadmap; e.g. looks beyond 2050, negative emissions, natural sinks, industry innovations, pathways to deliver Paris, costs, just transition, etc.
- The Commission noted that historically they have been very optimistic on CCS but it has not happened and they need to understand why this is the case. There is interest in understanding how the EC can improve the situation for CCS, e.g. economics and social acceptance but also a sense that the EC has done what was asked, e.g. NER300, but this

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has been insufficient (inference that MS and industry did not respond as expected). Overall the colleagues were well informed on CCS albeit seemingly sceptical about its prospects.

- A number of topics came up in the discussions;
    - BECCS and the development of sustainable biomass supply chains. Also questions how the ETS may need to be reformed to support negative emissions. Will Direct Air Capture technologies – too energy expensive.
    - Need to undertake analysis on potential CO2 sources which may be amenable to capture.
    - The locational development of CCS, importance of infrastructure and how this can be modelled.
    - What contribution might utilisation play in decarbonisation efforts
- ACTION: LW to forward ZEP market economics work with the EC.
- ACTION: ZEP offered to host a workshop for the Commission and bring together experts that could assist the EC in exploring the technical issues that the MCS needs to address.

DG Climate Action, InnovFin EDP

- Attending: Attending: Maria Velkova, Co-ordinator NER300 & Petra Sarapatkova, InnovFin EDP.
- The meeting was arranged to receive an update on the InnovFin Energy Demo Projects (EDP). InnovFin EDP has so far received €450 mn of unspent NER300 funds, with potentially more being expected to be allocated from other NEr300 projects that are unable to proceed. The InnovFin EDP monies are deployed as preferential loans that will take higher risk projects, without pricing in the risk, as the EC is 100% covering the loan.
- A relatively small amount (c.€10 mn) can also be deployed through InnovFin Advisory which is used to help projects develop bankable propositions that can apply to EDP or apply for funding elsewhere. These funds are used to enable to developers to mature the project or bring in sub-contractors to undertake this work.
- In addition the European Investment Advisory Hub has been established by the EC and EIB to act as single point of contact for prospective project developers.
- To date no CCS projects have yet applied to InnovFin EDP although the EC expressed its desire to identify projects that can be supported. We noted that developers would also generally prefer grant support but the EC said that there is currently no intention to restructure InnovFin EDP to enable the funds to be allocated as grants.

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- Importantly it was noted that the loan would not necessarily have to be for a complete CCS chain and that the restrictive NER300 annex project list of eligible projects does not apply to InnovFin EDP. For example, this could enable InnovFin EDP to be used for a loan just for transport and storage infrastructure which third party emitters could access. They would not need to present as one whole project.
- They are not establishing extensive eligibility criteria for projects – just need to meet broad requirements. No specific criteria established for any projects (CCS or renewable).
- A priority for the EIB has been the importance of a clear revenue stream and some form of shadow CO2 price for industry might be deemed sufficient. It was noted that there is a lot of good will from the EIB to try and make this work for CCS.
- End date for instrument: Not clear yet but unspent monies will eventually roll into the new Innovation Fund although there is pressure to disperse the monies through InnovFin EDP.
- ACTION: ZEP agreed to raise the InnovFin opportunity with CCS developers that might be in a position to benefit from the instrument.

Cabinet to Bart Tommlein, Flemish minster for the Budget, Finance and Energy

- Attending: Kelsey Van Maris and Elise Van Gerven, Energy Advisers to Bart Tommlein, Flemish Minister for the Budget, Finance and Energy.
- The Flemish Cabinet said that there was currently an "Energy Pact" being agreed between regions in Belgium, which aims to look at how to decarbonise heat, transport, power and industry to 2050.
- It was noted that the Port of Antwerp had recently purchased a pipeline company and as exploring options for transporting CO2. The Flemish Cabinet agreed to share contact details for the relevant person n the Port for ZEP to follow up with.
- The four PCIs for CO2 transport were discussed. It was noted there had previously been discussions about a PCI between Rotterdam and Antwerp, and that there could be potential to revisit this proposal. Constraints to cross border movements including the ratification of the London Protocol amendment were raised.
- The SET-Plan actions were discussed.
- Graeme Sweeney outlined ZEP's ME5 modelling work, and it was agreed that the Flemish Cabinet would review this to see whether they would find it useful for some work to be done on regional modelling for Flanders.
- Funding, including the InnovFin EDP and ZEP's recommendations for creating a market maker through the Innovation Fund were discussed.

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14th March 2018

Agenda Item 1.e.II: SET-Plan IWG9 CCS and CCU – January draft meeting minutes

The Hague – 30th January 2018

Attendance

William	Christensen	Norwegian Government - IWG9 Co-Chair
Joelle	Rekers	Dutch Government - IWG9 Co-Chair
Graeme	Sweeney	ZEP - IWG9 Co-Chair
Kjærgård Espen	Bernhard	Norwegian Government
Tim	Bertels	CCUS4Industry Rotterdam
Niels Peter	Christensen	Gassnova
Landry	Cochard	CO_2 Value Europe
Amy	Cutter	UK Government
Damien	Dallemagne	CO_2 Value Europe
Lamberto	Eldering	Statoil
Andrea	Forabosco	Shell
Jean-Theo	Ghenda	Eurofer
Chris	Gittins	TAQA
Harriet	Howe	ZEP Secretariat
Vassilios	Kougionas	European Commission
Vladimir	Kuberec	European Commission
Enrico	Maggio	Sotocarbo
Jose Jimenez	Mingo	European Commission
Edesio	Miranda-Barbosa	JRC
Brian	Murphy	Ervia
Jonathan	Pearce	British Geological Survey
Alberto	Pettinau	Sotacarbo
Nils	Røkke	Sintef/EERA
Bill	Senior	BP
Aage	Stangeland	The Research Council of Norway
Hermann	Stelzer	German Government
Rob	van der Meer	HeidelbergCement
Luke	Warren	ZEP Secretariat
Randolf	Weterings	Port of Rotterdam Authority
Keith	Whiriskey	Bellona
Ton	Wildenborg	TNO/CO_2 GeoNet
Sophie	Wilmet	Cefic

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1. Introduction and general update

Joelle Rekers (NL) introduced the meeting as the first as a new 'Implementation Working Group', following the adoption of the Implementation Plan in September 2017. There was an overview of meeting objectives. The objectives of the IWG9 will include executing the actions set out in the Implementation Plan, identifying policy priorities and potential risks to delivery, and maintaining an ongoing dialogue between Member States, industry stakeholders and the European Commission.

2. Presentation: ACT Projects

Aage Stangeland (Research Council of Norway) (AS) presented slides on the 8 new ACT projects, focusing on the ALLIGN and ELEGANCY projects.

A new ACT call will be launched in June 2018. This will be linked to Mission Innovation and a number of the participating countries have been invited to join, including France, USA, Canada, and Australia. There was a discussion on how this international focus would fit with the SET-Plan, with AS responding that countries outside Europe would have access to other funding vehicles. There was agreement that the flexibility of the Implementation Plan could also allow for the inclusion of international funding opportunities for European projects.

AS noted that the Implementation Plan for Action 9 provided useful input for the ACT call text and for selecting new projects. ACT is also an important tool for Member States to deliver the Implementation Plan activities.

3. Presentation: ERVIA CORK CCS Project

Brian Murphy (Ervia) presented slides outlining the Ervia Cork CCS project, an Irish CCS project, involving 2 existing CCGTs and an oil refinery. There may also be opportunities to develop a regional CCS cluster, bringing in local pharmaceutical manufacturers. The project is currently seeking support through the Innovation Fund, ACT, H2020, and potentially the Connecting Europe Facility. Ervia are also looking into options for hydrogen and BECCS.

It was agreed that the project should be added to actions listed under R&I Activity 1, addressing the existing gaps for new CCS power sector feasibility studies beyond 2030.

Action: *The ZEP Secretariat took an action to follow up with Ervia for project details to be included in the Implementation Plan under R&I Activity 1.*

4. Presentation: Port of Rotterdam Project

Tim Bertels (CCUS4Industry Rotterdam) presented slides on the Port of Rotterdam CCUS backbone project, including the outcomes of the completed feasibility study and forward timeline.

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The project is aiming for FID by the end of 2018/early 2019. The Port of Rotterdam cluster is one of the actions currently included under R&I Activity 2 of the Implementation Plan.

Action: *The IWG agreed to consider how existing funds under InnovFin could be accessed as well as the Connecting Europe Facility through PCI status as these could provide an early source of funds for the project. A subgroup should work alongside the Task Force which was set up by the Port of Rotterdam Authority to look into this.*

5. Future work of IWG9: Commission perspectives on next steps and H2020 funding for support

Jose Jimenez Mingo, head of the SET-Plan team, provided an overview of the Commission's perspectives on next steps and Horizon 2020 funding for a 'Coordination and Support Action' (there was emphasis that this should not be referred to as a Secretariat). JJM noted that the Commission had been impressed by the past work of the TWG9 in successfully and efficiently developing the Implementation Plan.

The Commission intend to support a continuation of the existing IWG structure and co-chair approach, with the function to execute the Implementation Plan and build links with commercial funding opportunities. The IWG also needs to incorporate reporting on progress and milestones to the SET-Plan Steering Committee.

A call will be launched in May this year for a €1 million CSA grant, which could be supported by a consortium, with a legal entity to manage the budget.

The CSA will also be responsible for coordinating engagement and outreach activities for the IWG9 once a grant is in place. Cooperation with other SET-Plan Action groups may also be embedded as a condition of the grant.

Action: *The IWG Co-Chairs took an action to draft a proposition outlining the core services required to be shared with Member States.*

6. Detailed review of the implementation plan

Action: *The ZEP Secretariat took an action to put together a spreadsheet summary of the Implementation Plan, including projects, activities, progress and risks, which could then be updated following each IWG9 meeting.*

R&I 1: Delivery of a whole-chain CCS project operating in the power sector:
Lamberto Eldering presented an update on Statoil's Magnum hydrogen project, which had been the only power sector project in the Implementation Plan. It was agreed that the Ervia Cork CCS project could now be added as a contributing activity.

Action: *The ZEP Secretariat agreed to share proposals for CCS and hydrogen under FP9 consultation with the IWG.*

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R&I Activity 2: Delivery of regional CCS and CCU clusters, including feasibility for European hydrogen infrastructure:
There were regional CCS updates from the Norwegian and UK Governments, with the Dutch CCS update covered earlier in the meeting in the Port of Rotterdam presentation. It was agreed that most of the work under this activity would require monitoring of the existing projects as they progress and identifying any potential risks to funding.

R&I Activity 3: EU PCIs for CO_2 transport infrastructure:
The IWG agreed to look into identifying potential barriers beyond the current policy instruments (e.g. the London Protocol) and that this would link up with work currently being undertaking by the ZEP NWPE.

R&I Activity 4: Establish a European Storage Atlas:
A number of activities are already underway, with the main objective to support the development of projects. Future work should include expansion into new regions, potentially driven by CO_2 EOR. It was agreed that further progression requires funding, which is accounted for in the Implementation Plan.
Action: *Storage subgroup to include the finances required to periodically update the storage atlas.*
Action: *William Christensen (WC) agreed to contact the Norwegian Petroleum Directorate to ask them to contribute to this activity.*

R&I Activity 5: Unlocking European storage capacity:
Discussions focused on how Member States can work with operators to progress storage appraisal, with a system of characterisation and certification needed. A subgroup will focus on putting together an updated list of pilot projects.

Action: *Storage subgroup to update the list of storage pilots into a new Implementation Plan spreadsheet.*

R&I Activity 6: Developing next-generation CO_2 capture technologies:
Nils Røkke presented EERA's plans to develop a Member and Associated States funding allocation process. The aim is to identify existing co-funding schemes to ensure better alignment of resources and greater efficiency and impact of research efforts, also linking to Mission Innovation.

R&I Activity 7: CCU Action:
Damien Dallemagne gave an update on CO_2 Value Europe, which has established work streams to monitor the progress of CCU activities in the Implementation Plan and will produce roadmaps to assess the major barriers and conditions for each of the technologies.
Action: *DD agreed to share a more detailed overview of the potentially risks and barriers at the next IWG9 meeting.*

R&I Activity 8: Understanding and communicating the role of CCS and CCU in meeting European and national energy and climate goals:
The ZEP Secretariat presented an overview of the Commission's mid-century strategy plans. The biggest gap identified is the lack of consistency between the role of CCS in climate modelling and national action.

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Action: *The ZEP Secretariat agreed that they would report back to the IWG on their meetings with DG CLIMA on this issue.*

7. AOB and next steps

It was agreed that the most efficient way to progress actions under each R&I Activity would be to establish separate sub-groups, which could hold more frequent teleconferences with the co-chairs, CSA, and interested stakeholders.

Each of the subgroups will have an 'R&I Champion' to present an update and progress at meetings. It was suggested that workshops could also be held once core services were in place.

The next meeting will be held in September in The Hague (tbc).

Action: *The ZEP Secretariat took an action to circulate a list of subgroups inviting IWG9 stakeholders to join.*

Action: *Paul Bonnetblanc (France) will be invited to present at the next meeting on the French CCU flagship project.*

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