7th ACT Knowledge Sharing Workshop
4-5 October 2023
Paris, France

Dear all,

On behalf of the ACT Consortium, I would like to invite the ACT3 & ACT4 projects, the ACT funding agencies, and all CCUS stakeholders, to attend the 7th ACT Knowledge Sharing Workshop.

The Workshop will take place in Paris, the heart of Europe. This should make traveling easy for many of us, and I hope to meet many of you in person in Paris. The focus of the Workshop is to share knowledge, experiences and results gained in the ongoing ACT3 projects and the knowledge and the ambitions of ACT4 projects. Furthermore, we believe the workshop will be an excellent opportunity for generating new ideas and building new networks. We have confidence that we all will be inspired by the achievements and ambitions of the ACT projects.

ACT is an international initiative to facilitate research and innovation of CO_2 capture, transport, utilisation and storage (CCUS) technologies. ACT aims to accelerate and mature CCUS technologies by funding transnational research and innovation projects. Sixteen countries, regions and provinces are working together in ACT with the ambition to fund world class research, development and innovation that can lead to safe and cost effective CCUS technology.

ACT started in 2016 and we have since then had four calls for applications and have funded 39 projects with € 108 million. The ACT projects have closed a number of knowledge gaps and delivered results of significant industrial interest. ACT have significant impact on accelerating the CCUS development towards wide deployment.

The previous ACT Knowledge Sharing Workshops have all been very fruitful and paved way for new networks and new ideas. We believe this year's workshop will be another good opportunity for learning and sharing experiences and further strengthening our networks and achievements.

The aim of the workshop is to ensure fruitful knowledge sharing and increase collaboration between the ACT funded projects. Furthermore, we also aim to engage with other CCUS initiatives and stakeholders, and we hope all participants will leave the workshop inspired and full of new ideas.

The workshop is a two-day event. There will be presentations from ongoing ACT projects and interactive sessions, including panel discussions and poster sessions.

I hope you will take this opportunity to learn more about CCUS and engage with the ACT family. I am also looking forward to meeting you in Paris.

Yours sincerely,
Aage Stangeland
The Research Council of Norway / ACT Coordinator
On behalf of the ACT Consortium

Venue and overall schedule

The venue for the workshop is:

Agence Nationale de la Recherche (ANR), 86 Rue Regnault, 75013 Paris, France

Overall schedule:

<table>
<tr><th>Wednesday 4th October 2023</th><th>Thursday 5th October 2023</th></tr>
<tr><td rowspan="2">09:00 - 17:30
ACT Knowledge Sharing Workshop</td><td>09:00 - 14:45
ACT Knowledge Sharing Workshop</td></tr>
<tr><td rowspan="2">16:00 – 20:00
Social event including dinner</td></tr>
<tr><td>17:30
Dinner cocktail</td></tr>
</table>

The workshop will mainly be a physical meeting, but with possibilities for virtual participations. There is no participation fee. All participants have to book and pay their own accommodation and travel.

Participants

It is our intention to have a group of 50 to 70 participants at the workshop. We expect all ACT3 and ACT4 project managers to attend the workshop in person. However, project managers outside Europe are welcome to join virtually to avoid long travels.

Some ACT projects might prefer physical participation for more than one person. This will be possible as long as we do not end up with more participants than the maximum capacity of our venue. All ACT project partners are in any cases welcome to join virtually.

Registration

For physical participation, please register by filling in this registration form no later than 22 September:

Registration form - ACT Knowledge Sharing Workshop 2023

Virtual attendees can join the workshop at Microsoft Teams by this link:

Click here to join the meeting.

If you prefer to receive a calendar invite to the workshop, please send a request by email to Aage Stangeland, asr@rcn.no.

Please note that there is no participate fee, but everybody must cover their own travel and accommodation cost.

Agenda for the ACT Knowledge Sharing Workshop 4-5 October 2023

Venue: Agence Nationale de la Recherche (ANR), 86 Rue Regnault, 75013 Paris, France

Wednesday October 4th, 2023 (morning)	
09:00	**Welcome to the ACT Knowledge Sharing Workshop 2023** Gerdi Breembroek, RVO / ACT
09:15	**Presentation of French Ministry of Education** Xavier Montagne
09:30	**Presentation of ANR** Pascal Bain
09:45	**Presentation of ADEME** Anne Varet
10:00	**Coffee break**
10:20	**Building industrial case for CO_2 capture** (85 minutes) Moderator: Andrew Hlasko, US DOE Introductory presentations (10 minutes each) - Chemical looping technologies (the LOUISE project), *Jochen Ströhle, Technische Universität Darmstadt* - Solid adsorbent looping technology (the ABSALT project) *Colin Snape, University of Nottingham* - Sustainable operation of CO2 capture plants (the SCOPE project) *Hanne Kvamsdal, SINTEF* - CO_2 Capture on ships (the EverLoNG project) *Marco Linders, TNO* **Panel discussion on industrial cases for CO_2 capture** (45 minutes)
11:45	**Lunch and networking**

	Wednesday October 4th, 2023 (afternoon)
13:30	**Future possibilities within the Clean Energy Transition Partnership (CETP)** Gerdi Breembroek, RVO / ACT
14:00	**Building business cases for sustainable CO_2 utilisation** (100 minutes) **Moderator: Pascal Bain, ANR** Introductory presentations (10 minutes each) - Convert CO_2 to biofuels and chemicals (the CooCE project), *Rocio A. Diaz-Chavez, Imperial College London* - Conversion of CO_2 from cement plant (the CREATE project) *Tim Stauft, Carbonova* - Convert CO_2 to Ethylene (the CoCaCO2La project) *Feifei Zhang, TWI* - Convert CO_2 to methanol (the NEXTCCUS project) Mahmoud Zendehdel, IRITALY Trading Company **Panel discussion on sustainable business cases for CO_2 utilisation** (60 minutes)
15:40	**Coffee break**
16:00	**Poster session** All ACT project managers are encouraged to bring a poster to present key findings of their projects.
17:30	**Dinner cocktail**

Thursday October 5th, 2023	
09:00	**Carbon sinks: What role can research play or have in accelerating their development in France?** Guillaume Boissonnet, CEA
09:30	**Key note presentation – The role of CCUS in the green transition** Joop Hazenberg, ZEP (Zero Emission Platform)
10:00	**Coffee break**

	Thursday October 5th, 2023 (continued)
10:15	**Upscaling to CO_2 storage in giga-ton scale** (90 minutes) **Moderator: Gerdi Breembroek, RVO** Introductory presentations (10 minutes each) - De-risiking CO_2 storage (the SHARP project), *Elin Skurtveit, NGI* - Micro seismic monitoring of storage sites (the ENSURE project) *Volker Oye, NORSAR* - New cement for CO_2 storage (the CEMENTEGRITY project) *Reinier van Noort, IFE* - Re-using depleted fields for CO_2 storage (The RETURN project) *Jelena Todorovic, SINTEF* - Connecting CO_2 sources and sinks (the ACTION project) *Anna Korre, Imperial College* **Panel discussion on upscaling to giga-ton CO_2 storage** (40 minutes)
11:45	**Lunch and networking**
13:30	**Research and innovation needed for CCUS deployment** (70 minutes) **Moderator: Heiko Gerhauser, PT Jülich** Introductory presentations (5 minutes each) - New concept for CO_2 Capture (the MeDORA project) *Roberta Veronezi Figueiredo, TNO* - Carbon sequestration in cement (the 3D Printing project) *Souradeep Gupta, Indian Institute of Science Bangalore* - Carbon conversion to cementitious materials for buildings (the MACE project) *Ana Aday, NREL* - Storing CO_2 in basalts (the PERBAS project) *Jörg Bialas, GEOMAR* - Monitoring CO_2 storage sites (the SPARSE project) *Peder Eliasson, SINTEF* - CO_2 injection program for depleted gas reservoirs (the AMIGO project) *Rick Chalaturnyk, University of Alberta* **Panel discussion on research and innovation needed for CCUS deployment (40 min)**
14:40	**French ministry subject of CCS&CCU in France** Carol Paquier
15:10	**Closing the workshop** (5 minutes) Gerdi Breembroek, RVO / ACT
15:45	**City walk**
18:15	**Social program:** Boat trip on the Seine, including dinner. Boat leaving 18.45. All must be ready to enter the boat at 18:15. The social program will end at approximately 20:00

Poster session

There will be a poster session in the afternoon Wednesday 4th October. All ACT3 and ACT4 projects are encouraged to bring a poster to the workshop. The following posters will be presented:

Project	Poster title	Presenter
ABSALT	Optimisation of silica-PEI for CO_2 capture	Lee Stevens
ABSALT	Comparative techno-economic and environmental assessment of the integration of MEA-based scrubbing and Silica PEI adsorbent-based CO_2 capture processes into cement plants	Colin Snape
ABSALT	Catalytic pyrolysis of spent solid CO_2 adsorbents for the recovery of raw materials and valuable heteroaromatic chemicals	Lee Stevens
ACTION	Advanced multitemporal modelling and optimisation of CO2 Transport, stOrage and utilisation Networks (ACT!ON)	Anna Korre
ANICA	An indirectly heated carbonate looping process for CO2 capture from lime and cement plants	Cynthia Kroumian
CEMENTEGRITY	Development and testing of novel cement designs for enhanced CCS well integrity	Reinier van Noort
CoCaCO2La	CoCaCO2La: Conversion of Captured CO_2 to Industrial Chemicals	Feifei Zhang
CooCE	Harnessing potential of biological CO_2 capture for Circular Economy	Rocio Diaz-Chavez
ENSURE	Effective monitoring of long-term site stability for transparent carbon capture and storage hazard assessment	Volker Oye
EverLoNG	Demonstration of ship-based carbon capture on board of two LNG fuelled ships	Marco Linders
LOUISE	Low-Cost CO_2 Capture by Chemical Looping Combustion of Waste-Derived Fuels	Jochen Ströle
MACE	Direct Carbon Conversion to Chemically Enhance Supplementary Cementitious Materials for Building Construction	Ana Aday
MeDORA	Membrane-assisted Dissolved Oxygen Removal from Amine solutions for CO_2 capture	Luca Ansaloni
NEXTCCUS	Green Energy Marvel: The NEXTCCUS Breakthrough	Mahmoud Zendehdel
PERBAS	PERBAS - Permanent sequestration of gigatons of CO_2 in continental margin basalt deposits	Jörg Bialas
RETURN	CO_2 storage: Zooming in to the near-wellbore zone	Jelena Todorovic
SCOPE	Sustainable OPEration of post-combustion Capture plants	Hanne Kvamsdal
SHARP	SHARP project: Contributing to safe CO_2 storage – key results from first half of the project	Elin Skurtveit
SPARSE	Low-cost, long-term CO_2 monitoring using SPARSE nodes	Peder Eliasson

Social Event

There will be an organized city walk Thursday 5th October from 16:00.

There will also be a boat trip on the river Seine Thursday 5th October from 18:15 to 20:00 and dinner will be served on the boat.

There are unfortunately only 40 seats available and the first to register can join the social event.

You can read more about the social event here.

Recommended hotels

Hotels close to ANR:

- Ibis Styles Paris Massena Olympiades Ibis Styles Paris Massena Olympiades, Paris – Tarifs 2023 (booking.com)
- Ibis Styles Paris Meteor Avenue d'Italie ibis Styles Paris Meteor Avenue d'Italie, Paris – Tarifs 2023 (booking.com)
- Ibis Styles Paris Bercy ibis Styles Paris Bercy, Paris – Tarifs 2023 (booking.com)
- Mercure Paris Gare De Lyon TGV Mercure Paris Gare De Lyon TGV, Paris – Tarifs 2023 (booking.com)

Hotels can also be found from the apps hotels.com and booking.com

Please note that you have to book your own hotel room.

Disclaimer: Hotels recommended due to their proximity to the ANR. We are not responsible for the choice of hotel.

Practical information – How to get there

The venue for the meetings is:

French National Research Agency (ANR) – *Agence Nationale de la Recherche (ANR)*
86 Rue Regnault
75013 Paris
France

How to get there - From Paris Gare du Nord Train Station :

1. **RER D** station at **Paris Gare du Nord** will take you to ***Gare de Lyon*** in 8 minutes. From there, take **metro line 14** (direction Olympiades) to **Olympiades** (4 stops ~ 7 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.

2. **Metro line 4** (*direction Bagneux*) at **Paris Gare du Nord** will take you to **Châtelet** (7 stops) in 8 minutes. From there, take **metro line 14** (direction Olympiades) to **Olympiades** (5 stops ~ 10 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.

3. **RER B** station at **Paris Gare du Nord** will take you to ***Châtelet-Les Halles*** in 3 minutes. Walk 5 minutes to change and from there, take **metro line 14** (direction Olympiades) to **Olympiades** (5 stops ~ 10 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.

From Roissy – Charles de Gaule Airport to the ANR by public transport :

Train : RER B ligne
The RER B line is a direct rail link between Paris (Denfert-Rochereau, Saint-Michel-Notre-Dame, Châtelet-Les-Halles, Gare du Nord) and Paris-Charles de Gaulle Airport. A free CDGVAL shuttle connects the stations with the airport terminals.

RER B station at **Paris Gare du Nord** will take you to **Châtelet – Les Halles** in 3 minutes. Walk 5 minutes to change and from there take **metro line 14** (direction Olympiades) to **Olympiades** (5 stops ~ 10 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.

- **Terminals 1 and 3 :** "Aéroport Charles de Gaulle 1" station
  - Terminal 1 is available by free CDGVAL shuttle (journey time : 6 minutes).
  - Terminal 3 is available by pedestrian walkway.
- **Terminal 2 :** "Aéroport Charles de Gaulle 2 TGV" station
  - Terminals 2C, 2D, 2E et 2F are availables by foot and by moving walkway.
  - Terminal 2A is available by foot or by free N1 shuttle from RER station, level 5.
  - Terminal 2G is available by free N2 shuttle, from Terminal 2F, exit 2.10.

Tariffs: 11,45 € (forfait Navigo, zones 1-5 accepted), train tickets can be bought at the airport train station. Frequency : Every 10-15 minutes on weekdays

By Taxi :

- Between Paris-Charles de Gaulle airport and Paris “right bank”: around 55 €.
- Between Paris-Charles de Gaulle airport and Paris “left bank”: around 62 €.

From Orly Airport to the ANR by public transport :

Getting to or from Paris-Orly via OrlyVal and RER B

Orlyval is an automatic metro that provides free travel between terminals 1-2-3 and 4. It also connects the RER station in Antony and thus connects Paris-Orly airport to Paris via the RER B. OrlyVal runs between Orly 1-2-3, Orly 4 and Antony station (RER B).

Orlyval will take you to Antony in 8 minutes, from there you will take RER B to **Cité Universitaire** in 10 minutes. Walk 5 minutes to change and from there take **Tram 3a** (direction Porte de Vincennes) to **Porte d'Ivry**. A 5 minutes walk will take to ANR.

Combined ticket OrlyVal + RER B from/to Paris* : Full fare ticket : 15.40 €, tickets can be bought at the airport train station.

Please note : Navigo passe and Mobilis tickets are not valid on OrlyVal (special pricing).

By Taxi

- Between Paris-Orly airport and Paris "right bank": around 41 €.
- Between Paris-Orly airport and Paris "left bank": around 35 €.

From Beauvais Airport to the ANR by public transport :

1. Bus Shuttle will take from Beauvais airport to Porte Maillot in around 1h20 (depending on traffic conditions). From *Porte Maillot*, you will walk to **Neuilly-Porte Maillot Station** and take the **RER C** (train) to **Bibliothèque François Mitterrand** Station in around 30 minutes. From there :

- Take **metro line 14** (direction Olympiades) to **Olympiades** (1 stop ~ 2 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.
- Walk 17 minutes to ANR (86 Rue Regnault, 75013 Paris). Best exit: 4- Rue du Tolbiac

2. Bus Shuttle will take from Beauvais airport to Porte Maillot in around 1h20 (depending on traffic conditions). From *Porte Maillot*, you will walk to **Neuilly-Porte Maillot Station** and take the **metro ligne 1** (direction Château de Vincennes) to **Châtelet** Station in around 14 minutes. From there take **metro line 14** (direction Olympiades) to **Olympiades** (5 stops ~ 10 minutes). A 8 minutes walk will take you to ANR. Best exit 4 – Rue du Château des Rentiers.

You can buy the ticket for the Bus Shuttle online : Paris ↔ Airport Shuttle: Aéroport Paris-Beauvais (aeroportparisbeauvais.com)

Paris subway fare : from 2,10 €

More informations : Travel passes and prices: Metro, RER, Bus | RATP

This is ACT

ACT is an international initiative to establish CO_2 capture, utilisation and storage (CCUS) as a tool to combat global warming. The participating countries are Canada/Alberta, Denmark, France, Germany, Greece, India, Italy, Norway, Romania, Spain, Switzerland, Turkey, United Kingdom and United States.

Please see the ACT web site for more details: www.act-ccs.eu

Brief description of the ACT3 projects

Details about the ACT3 projects are available at the ACT web site and a short summary is listed below.

Project	Title	Coordinator
ABSALT	Accelerating Basic Solid Adsorbent Looping Technology	Colin Snape, University of Nottingham
ACTION	Advanced Multitemporal Modelling and Optimisation of CO_2 Transport and Storage Networks	Anna Korre, Imperial College
CEMENTEGRITY	Development and testing of novel cement designs for enhanced CCS well integrity	Reinier van Noort, IFE
CoCaCO2La	Conversion of Captured CO_2 to Industrial Chemicals	Damien Kirkpatrick, TWI Ltd
CooCE	Harnessing Potential of Biological CO2 Capture for Circular Economy	Tomas Morosinotto, University of Padova
CREATE	Carbon Reforming to Economic Additives for Transitioning into Emission-less era (CREATE)	Mina Zarabian, Carbonova Corp.
ENSURE	Effective monitoring of long-term site stability for transparent carbon capture and storage hazard assessment	Bettina Görtz-Allmann, NORSAR
EverLoNG	Demonstration of ship-based carbon capture on LNG fuelled ships	Marco Linders, TNO
LOUISE	Low-Cost CO_2 Capture by Chemical Looping Combustion of Waste-Derived Fuels	Jochen Ströhle, TU Darmstad
NEXTCCUS	Next Generation Electrochemical System For Sustainable Direct CO_2 Capture and Utilization/Storage as Clean Solar Fuel	Mahmoud Zendehdel, IRITALY
RETURN	Reusing depleted oil and gas fields for CO_2 sequestration	Pierre Cerasi, SINTEF
SCOPE	Sustainable Operation of post-combustion Capture plants	Hanne Kvamsdal, SINTEF
SHARP	Stress history and reservoir pressure for improved quantification of CO_2 storage containment risks	Elin Skurtveit, NGI

Brief description of the ACT4 projects

Details about the ACT4 projects are available at the ACT web site and a short summary is listed below.

Project	Title	Coordinator
3D PRINTEING	Maximizing carbon sequestration in cement-based constructions through material innovation and additive manufacturing	Souradeep Gupta, Indian Institute of Science, Bangalore
AMIGO	CO_2 injection program for depleted gas reservoir utilizing state-of-art and novel technical workflows	Riley Gordon, Repsol
MACE	Direct Carbon Conversion to Chemically Enhance Supplementary Cementitious Materials for Building Construction	Wale Odukomaiya, NREL
MeDORA	Membrane-assisted Dissolved Oxygen Removal from Amine solution for CO_2 capture	Luca Ansaloni, SINTEF
PERBAS	Permanent sequestration of gigatons of CO_2 in continental margin basalt deposits	Jörg Bialas, GEOMAR
SPARSE	Sparse Passive-Active Reservoir monitoring using Seismic, Electromagnetics, gravity, and surface deformation	Peder Eliasson, SINTEF

Organising committee

The organising committee welcomes you to the ACT Knowledge Sharing workshop!
Please contact one of us if you have any questions:

Oksana Toma, ADEME, oksana.toma@ademe.fr
Thamires Moreira, Thamires.MOREIRA@agencerecherche.fr
Pascal Bain, ANR, Pascal.BAIN@agencerecherche.fr
Li Hua, RVO, li.hua@rvo.nl
Gerdi Breembroek, RVO, gerdi.breembroek@rvo.nl
Andrew Hlasko, US DOE, andrew.hlasko@hq.doe.gov
Anna Rosenberg, GSRI, a.rosenberg@gsrt.gr
Aage Stangeland, RCN, ast@rcn.no