



European Carbon Dioxide Capture and Storage Laboratory Infrastructure

ENABLING LOW TO ZERO CO2 EMISSIONS FROM INDUSTRY AND POWER GENERATION...
TO HELP COMBATING GLOBAL CLIMATE CHANGE

NEWSFLASH

The future of the ECCSEL Research Infrastructure: ECCSEL ERIC

Considering that ECCSEL is justified by the need for a dedicated and coordinated research environment, striving to close specific knowledge gaps, pushing the forefront of technological development beyond the state-of-the-art, and thereby accelerating the commercialisation and deployment of CCS methods, next step will be to set up the current ECCSEL Research Infrastructure as a **European Research Infrastructure Consortium (ERIC)**. This legal entity is recognised by the Council Regulation of the European Commission.

More info about ECCSEL ERIC can be found on page 2.



3rd TA programme, the final countdown

The 3rd call for proposals for free access financed by the European Unions H2020 programme is still open.

The call will stay open until July 2017 (or until TA budget has been used up). Applications will be reviewed monthly with the first cut-off date being the 31st January 2017. Research projects must be completed by mid-August 2017 and costs reported by end of August.

More info about ECCSEL TA programme is on page 4.

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European Carbon Dioxide Capture and Storage Laboratory Infrastructure

The future of the ECCSEL Research Infrastructure: ECCSEL ERIC

What is ECCSEL ERIC?

Close to the end of the 3rd phase of ECCSEL implementation, the ECCSEL continues satisfactory moving forward to accomplish its main goal: to be set up as a central hub responsible for the coordinated operation of several research facilities operating under a joint hallmark called ECCSEL ERIC.

ECCSEL ERIC vision:

Enable low to zero CO₂ emissions from industry and power generation

Subject to this vision, ECCSEL shall facilitate development of CCS techniques compatible with the 2°C scenario and the 1.5°C ambition and become the hallmark of experimental research pertaining to CO₂ capture, transport and storage techniques (CCS) and selected areas of use (CCUS).

What will ECCSEL ERIC do?

Within this framework, ECCSEL ERIC shall coordinate the use of the research facilities in the

distributed infrastructure and coordinate plans for their upgrade and for new investments. ECCSEL ERIC shall enable and assure easy international open access to the infrastructure and within its means and competence, support the owners of the research facilities in their endeavors to enhance the operations of their facilities and their undertakings to upgrade them and to create new facilities.

How will ECCSEL ERIC do it?

ECCSEL shall achieve its main goal by pursuing a dual approach:

- Consolidating, implementing, operating and developing distributed resources comprising existing and upgraded research facilities as well as new ones.
- Facilitating superior experimental research on improved and new CO₂ capture, transport and storage techniques (CCS), envisaging commercial uptake by 2020-2030 and beyond 2030, respectively.

Guidelines for operation

Consistent with the European Commission and the European Strategy Forum on Research Infrastructures (ESFRI), ECCSEL shall, as a European Research Infrastructure, comprise facilities, resources or services of a unique nature that have been identified by pan-European scientific communities to conduct top-level research.

ECCSEL ERIC shall make facilities required for conducting research in priority areas available to the international research community. By doing this, it will contribute to pushing the forefront of technological development beyond the current state-of-the-art, accelerating the commercialisation & deployment of CCS.

And the expansion plans...

The network in the future will decide on an extension of the ECCSEL ERIC activities towards utilisation of CO₂ (CCUS) beyond enhanced oil recovery (EOR).



Simulations

Bench scale

Lab pilot

Full height pilot

Mobile test unit

Demonstration

Full scale



European Carbon Dioxide Capture and Storage Laboratory Infrastructure

The future of the network: ECCSEL ERIC

Find below a brief summary of the current list of **ECCSEL ERIC research facilities** at start-up.

Country	Institution	CCS research category	Short name	Long name
France	EDF	Capture	Le Havre CO ₂ capture pilot	CO ₂ capture pilot at EDF power plant in Le Havre
	INERIS	Transport	Mont-la-Ville	CO ₂ transport research facility: Mont-la-Ville experimental site in Oise
	Andra	Storage	LS-Andra	Meuse/Haute-Marne underground laboratory
	BRGM	Storage	BIOREP	BIO-Reactor for deep environments. Monitoring of microbiological and geochemical processes in high pressure and dynamic conditions
	INERIS	Storage	Catenoy	Catenoy experimental site in Oise
	IFPEN	Storage	ESCORT	Equipment for soil CO ₂ origin tracking
	IFPEN	Storage	GasGeochem	Instrumentation and expertise to analyse and interpret gas geochemistry data
Italy	OGS	Storage	DeepLab	DeepLab Sea Floor Landers for meteoceanographic physical and geochemical data collection
		Storage	Aircraft	Research aircraft equipped with high-tech remote sensing instruments
		Storage	BioMarineLab	Ecological laboratory for mesocosm experiments
		Storage	Panarea NatLab	Panarea Natural Laboratory
		Storage	Latera NatLab - New built oper. end 2016	Latera Natural laboratory
	Sotacarbo	Capture	COHYGEN	Coal to Hydrogen Generation pilot plant with new completed upgrade: Integration of the existing COHYGEN plant with a new column for CO ₂ capture with liquid solvents
		Capture	New built oper. 3/2016	Carbon to new fuels pilot plant (CO ₂ recovery)
		Capture	New built oper. 12/2016	CO ₂ capture laboratory
		Capture	New built oper. 6/2016	Photoelectrochemical reduction laboratory (CO ₂ recovery)
		Capture	New built, partially operating	Integrated system with gasification, membrane separation and syngas/CO ₂ -to-liquids (already funded, partially operating)
		Capture	New built and operational	IOSTO pilot unit for H ₂ S conversion into H ₂ SO ₄ in flue gas from oxy-combustion (already operating)
Netherlands	TNO	Storage	Latera NatLab - New built oper. end 2016	Latera Natural laboratory
		Capture	Mini Plant	Mini Plant for solvent preparation & testing
		Capture	Qscan	QSCAN solvent test street
		Capture	CLC	CLC fixed bed facility
		Capture	High-P abs&des	High pressure absorption and desorption pilot
		Capture	C1	TNO Gas Treatment laboratory
United Kingdom	BGS/NERC	Storage	MobSeis	Mobile Seismic Array
		Storage	TPRL	Transport properties research laboratory
		Storage	RMPL	Rock mechanics and physics laboratory
		Storage	HTL	Hydrothermal laboratory
		Storage	Gas Mon	Near surface gas monitoring facility
	UKCCS Research Centre - PACT	Storage	S16	BGS geomicrobiology laboratory
		Capture	PACT-PF	PACT 25 kW Air-Oxy Combustion Plant (25kW PF rig)
		Capture	PACT-ACP	PACT 250 kW Air Combustion Plant (ACP)
		Capture	PC17	PACT 250kW Oxyfuel Combustion Plant (OCP)
		Capture	PACT-GMF	PACT Gas Mixing Facility (GMF)
		Capture	PACT-GT	PACT Gas Turbine (GT)
		Capture	PC19	PACT Solvent-based Carbon Capture Plant (SCCP)

The future of the network: ECCSEL ERIC

The final list of **ECCSEL ERIC research facilities** will be however determined by the final list of founding members / observers.

Country	Institution	CCS research category	Short name	Long name
Norway	NTNU	Capture	MEML	Membrane facilities include: MEM-FAB facilities to fabricate polymer-based membranes; MEM-PERM facilities to test membrane gas permeation performance; extension of polymer membrane lab (task 2,3 Norway CCS RI Phase 1)
		Capture	ABSL	Absorption laboratories include: ABSKIN Absorption Kinetic Studies; ABSDEG Solvent degradation laboratory; ABSEQ Thermodynamic studies package; extension of lab scale absorption equipment (Task 2.1 NORWAY CCS RI Phase 1); extension of absorption pilot (Task 2.2 NORWAY CCS RI Phase 1)
	SINTEF ENERGY RESEARCH	Capture	CLC Hot Rig	Chemical Looping Combustion Rig
		Capture	COMBLAB	High pressure Oxy-Fuel Combustion Facility - HIPROX
		Capture	BIOLAB	Multifuel reactor setup (C22)
		Capture	SEPPIL	Low temperature separation pilot (C9 from NORWAY CCS RI Phase 2) - New built oper. 2017
		Transport	CO2Mix – VLE	Facility for accurate phase equilibrium measurements of CO2-rich mixtures
		Transport	DEPRESS	Depressurization facility (Task 2.7 Norway CCS RI Phase 1) - New built oper. 2017
		Transport	VISC-DENS	Viscosity and density apparatus (Task 2.8 Norway CCS RI Phase 1) - New built oper. 2017
	SINTEF (MC)	Capture	SINTEF S/CHLab	Sorbent laboratories SLab for CCS includes: high throughput preparation and testing laboratory for materials in CCS related technologies (C30-M); sorbent based and Chemical looping laboratories (CY4-H); sulphur laboratory for material and component testing (C37-H – see below); extension of solid sorbent lab CY4 (Task 2.5 NORWAY CCS RI Phase 1); CHLab: In situ characterization of solid materials for CCS
		Capture	SINTEF PPLab	Powder processing laboratories for CCS includes: pellet/particle formulation of solids (C26-M)
		Capture	SINTEF Mlab	Membrane laboratories for CCS includes: ceramic- and metallic based membranes laboratories for H2, O2 and CO2 separation (CY3-H); sulphur laboratory for material and component testing (C37-H – see above); extension of high temperature membrane lab (Task 2.4 Norway CCS RI Phase 1)
		Capture	SINTEF SDR	Solvent degradation rig
		Capture	SINTEF Tiller Pilot	Tiller Pilot Plant - Tiller Post Combustion Lab pilot (C36)
		Transport	Giskås	Pipeline crack arrest test
		SINTEF PETROLEUM	Storage	SINTEF PR – SCAL
	Storage		SINTEF PR – pVT	Fluid (pVT) laboratory
	Storage		SINTEF PR-RESLab	SINTEF-NTNU Reservoir laboratory, including μ -CT
	Storage		SINTEF PR-WILab	SINTEF-NTNU Well Integrity laboratory
	Storage		SINTEF PR-FPLab	SINTEF Formation Physics laboratory

ECCSEL Training Course on research infrastructures for CO₂ storage: specific focus on monitoring and natural laboratories

On 29th March 2017 OGS organized the second Training Course on research infrastructures for CO₂ storage, foreseen under ECCSEL WP5 Capacity Building. Held in Rome, the session was kindly hosted by University La Sapienza.

Attended by 40 people, the course provided the opportunity to exchange experience and space for networking among experts in the CCS sector, potential stakeholders and a wide and young representation of PhD students.

Sverre Quale, ECCSEL Project Director, was in charge of the opening session presenting ECCSEL and its roadmap to the permanent operation (ERIC), introducing future investments of the network and explaining conditions for membership enlargement. Quale was also responsible of presenting ECCSEL facilities and introducing the huge opportunity that the Transnational Access (TA) programme represents for the international scientific community, also present in the course.



Technical storage topics were empowered by specific sessions on **monitoring techniques** and on **off-shore and on-shore natural laboratories**, which are highly relevant in a storage scenario.

opened by OGS and connected to ECCSEL network. More details related with this issue and about the low cost sensors available for monitoring were provided by Alessandro Pavan from OGS.



Scientific themes were split into two main sessions. At the end of the morning, focus was given to off-shore laboratories. Professor Lombardi from University La Sapienza highlighted the importance of natural laboratories for CCS. In this sense and being included within the ECCSEL facilities, the Panarea laboratory in Italy was illustrated in its peculiarities by its responsible, Cinzia De Vittor from OGS. Subsequently, Stanley Beaubien from University La Sapienza presented the important scientific activities conducted in Panarea in the past years. Following the same structure, Beaubien also introduced the joint research activities performed in the Latera caldera, such introducing the afternoon session dedicated to on-shore laboratories; in Latera a new facility is about to be

Finally the course ended with an application of remote sensing techniques to gas monitoring, presented by Franco Coren from OGS.

In conclusion, positive feedback of the training course was given to the organisation and attendees provided excellent evaluations specially on contents, speakers and educational methods. Very good feelings for continuing moving forward!

Next event:

12 - 14 June 2017
**9th Trondheim
Conference on CO₂
Capture, Transport and
Storage (TCCS9)**
Trondheim (Norway)
www.sintef.no/projectweb/tccs-9/

ECCSEL TA programme Take opportunity during the final countdown!

The ECCSEL H2020 Infradev-3 project provides funding for a Transnational Access (TA) programme that offers access to **44 research facilities** which are part of the ECCSEL CCS Research Infrastructure in Europe.

Transnational Access offered to the participating research facilities within ECCSEL includes:

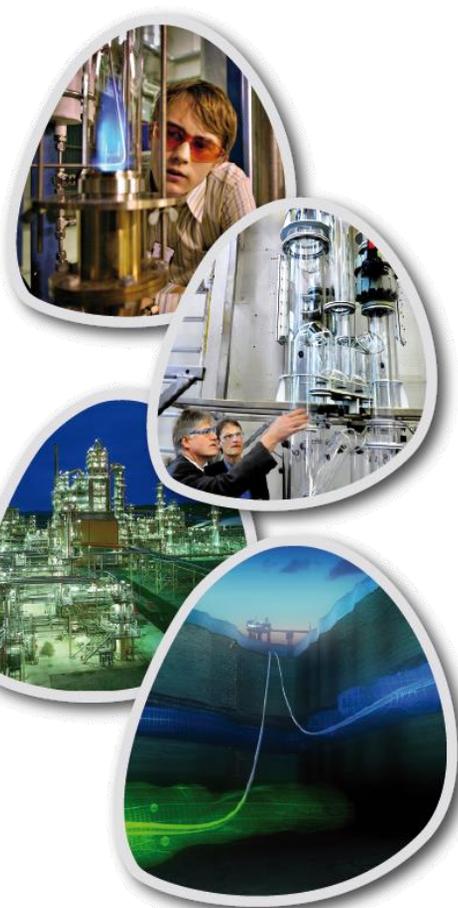
- **Free access** for eligible users/user groups to research facilities.
- Support for **travel, logistics and accommodation** for one user per research project.
- **Free access to information and data** in the public domain held at the ECCSEL Research Infrastructure's facility.

For each research project up to 500€ is granted for travel and up to 100€ is available for one researcher per day spent at the visited facility for accommodation and food (receipts need to be provided).

Access is free for users from European member states, European associated states or

developing countries with proposal(s) approved for funding as long as the results can be made public. Researchers can apply for Transnational Access if they meet following conditions:

- Users with a majority of users not working in a European or associated country is limited to 20% of the total amount of units of access provided under the grant (the User Group Leader and the majority of the User Group members work in an institution/SME established in a member state of the European Union or an European associated state.
- The User Group Leader and the majority of the User Group members work in an institution / SME located in a country other than the country where the legal entity operating the infrastructure is established.
- Only User Groups that are entitled to disseminate the results they have generated under the project are eligible to benefit from free of charge access to the infrastructure.



More info about TA programme at www.eccsel.org

3rd call is still open, but... the final countdown has started!

This call will stay open until July 2017 (or until TA budget has been used up).

Applications will be reviewed monthly with 1st cut-off date being the 31st January 2017.

Research projects must be completed by mid-August 2017 and costs reported by end of August.

AGENDA

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**9th Trondheim
Conference on CO2
Capture, Transport and
Storage (TCCS9)**
Trondheim (Norway)
www.sintef.no/projectweb/tccs-9/

19 - 25 June 2017
**European Sustainable
Energy Week (EUSEW)**
Brussels (Belgium)
eusew.eu

22 May 2017
**ECCSEL Industrial
Advisory Group Meeting**
Amsterdam (The
Netherlands)
eccsel.org

17 - 20 July 2017
**Carbon Management
Technology Conference
(CMTC 2017)**
Houston (USA)
www.fscaronmanagement.org/cmtc/2017

ECCSEL National Info Day in Italy

Organised by the National Nodes, **ECCSEL Info Days** aim to bring awareness to all relevant stakeholders in countries where the network is present. These events also offer the possibilities to liaise with on-going relevant R&D activities in each country.



Rome, 2nd March

Organized and chaired by OGS, the ECCSEL Italian National Node, the first Italian National Info Day was held in Rome on 2nd March 2017. Stakeholders from the most relevant public research institutes and some industrial partners attended the event. Salvatore la Rosa from the Italian Ministry of University and Research was the key note speaker in charge of presenting the challenging process that led to the ERIC establishment.

The Italian facilities accessible through the ECCSEL Transnational Access Programme were presented by Michela Vellico and Cinzia De Vittor from OGS and by Alberto Pettinau from Sotacarbo. The Info Day was lively and interactive, presenting good potentialities for a national membership enlargement and the development of new collaborations in the future.

ASK ECCSEL

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ECCSEL partners

