



*European Carbon Dioxide
Capture and Storage Laboratory Infrastructure*

Transnational Access to the ECCSEL RI

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H2020 Infradev-3 implementation project (2015 - 2017) providing trans-national access to 43 research facilities across Europe

14 partners are part of this project:

- **NTNU** (Norway) – Project Leader
- **BGS** (United Kingdom)
- **BRGM** (France)
- **CERTH** (Greece)
- **CIUDEN** (Spain)
- **ETH Zurich** (Switzerland)
- **GIG** (Poland)
- **OGS** (Italy)
- **PGI-NRI** (Poland)
- **SINTEF Energy** (Norway)
- **SINTEF Materials and Chemistry** (Norway)
- **SINTEF Petroleum** (Norway)
- **SOTACARBO** (Italy)
- **TNO** (The Netherlands)



Implementation and Transnational Access

Sorted by category/science area

Capture Labs

- Absorption Labs
- Membrane Labs
- Solid Sorbent Labs
- Cryogenics Labs
- Combustion Labs



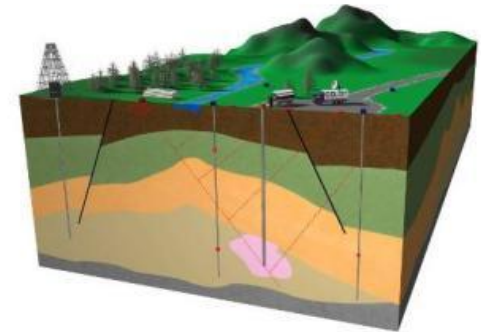
Transport Labs

- CO₂ characterization Labs
- Material integrity Labs



Storage Labs

- Rock characterization Labs
- Field Labs



43 facilities are included in the Transnational Access program

Access is offered to 43 outstanding laboratories especially designed for the study of technologies and processes in all areas of CCS

NTNU (Norway):

- Fabricate polymer-based membranes
- Test membrane gas permeation performance
- Absorption kinetic studies
- Solvent degradation laboratory
- Thermodynamic studies package

TNO (The Netherlands):

- Mini Plant for solvent preparation & testing
- QSCAN (quick scan) solvent test street
- CLC fixed bed facility
- High pressure absorption & desorption pilot

BGS (United Kingdom):

- **Transport properties research lab: Multi-phase flow in natural and engineered, low and ultra-low permeability geomaterials**
- **Rock Mechanics laboratory**
- **Hydrothermal Laboratory**
- **Near surface gas monitoring facility**

SINTEF (Norway):

- Sorbent laboratories for CCS
- In situ characterization of solid materials for CCS
- Powder processing laboratories for CCS
- Membrane laboratories for CCS
- Solvent degradation Rig
- Tiller Pilot Plant (380 kW) designed to be as similar as possible to a full scale post combustion plant (with CO₂ absorption and solvent regeneration).

43 Facilities are included in the Transnational Access program

CIUDEN (Spain):

- Pilot for CO₂ injection in soils
- Transport test rig at CO₂ technology Development centre for CO₂ capture
- CO₂ storage technology development plant

PGI-NRI (Poland):

- Micro Analysis Laboratory (isotopic, mineralogical and petrographical investigations, environmental protection studies, microbiology and archaeology)
- Geophysical lab with tools for monitoring of shallow subsurface as well as groundwater-soil system with the use of a suite of geophysical methods

OGS (Italy):

- DeepLab sea floor landers for meteoceanographic physical and geochemical data collection
- Research aircraft equipped with high-tech remote sensing instruments
- Ecological laboratory for mesocosm experiments
- Panarea Natural Laboratory to study the impact of CO₂ on benthic organisms and marine ecosystems

43 Facilities are included in the Transnational Access program

SINTEF Energy (Norway):

- Chemical Looping Combustion rig
- High pressure Oxy-Fuel combustion facility
- Facility for accurate phase equilibrium measurements of CO₂-rich mixtures

CERTH (Greece):

- Chemical Looping Combustion facility
- CO₂ storage facilities

SOTACARBO (Italy):

- Coal to Hydrogen Generation pilot plant

BRGM (France):

- Monitoring of microbiological and geochemical processes in high pressure and dynamic conditions

ETH Zurich (Switzerland):

- Adsorption equilibrium measurement balance
- Two column lab PSA setup
- Mineral carbonation: Flue gas mineralization unit
- High pressure hydrostatic flow cell

GIG (Poland):

- High pressure thermogravimetric analyser
- Fixed bed reactor
- Pilot-scale moving bed reactor

SINTEF Petroleum (Norway):

- Core Flood (SCAL) laboratory
- Fluid (pVT) laboratory

Transnational Access

Fact sheets (web) for all 43 TA facilities

- Organisation name
- Installation name
- Location (Google map coming soon)
- Category, Science area
- Short description
- Pictures
- Calendar (availability coming soon)

Description of the infrastructure	
RI number	C2
Name of the infrastructure*	TNO
Location (town, country):	Rotterdam
Web site address:	www.tno.nl
Legal name of organisation operating the infrastructure	
Location of organisation (town, country):	
Contact person: name, Tel., e mail:	

*Infrastructure (s): means a facility, a resource (or a coherent set of them) together with the services that are used by the scientific community to conduct research.

**Installation: means a part of an infrastructure that could be used independently.

Name of installation**	
TNO Masseyville Pilot Plant	
Description	
Access is offered to state of the art, of carbon capture processes and technologies.	
The TNO Masseyville Pilot Plant is a 0.5 MWth pilot scale plant that has obtained highly successful results in running for more than 1000 hours.	
The pilot plant activities are supported by the TNO Laboratory for Energy Conversion.	
TNO lab at Delft with the following facilities:	
a. Mini Plant for solvent preparation	
b. High throughput solvent screening	
c. High pressure absorption and desorption	
d. Chemical looping fixed bed	

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Description of the infrastructure	
RI number	
Name of the infrastructure*	
Location (town, country):	
Web site address:	
Legal name of organisation operating the infrastructure	
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Name of installation**	
Pilot scale 0.5 MWth	
Description	
The scheme shows KSTVA in oxy-fuel combustion facility essentially consisting of a power plant, a cleaning path catalyst, an air (ESP) and a blower or recirculation system for induced draught transport of flue-gas system.	
The combustion chamber is a cylindrical 7,000 mm diameter and 1,400 mm high plate heat exchanger.	
Flame of cooling	
Refract 4,000 mm	
meas In	

Description of the infrastructure	
RI number	S11
Name of the infrastructure*	BGS Transport Properties Research Laboratory
Location (town, country):	Keyworth, Nottingham, UK
Web site address:	www.bgs.ac.uk
Legal name of organisation operating the infrastructure	Natural Environment Research Council represented by the British Geological Survey
Location of organisation (town, country):	Keyworth, Nottingham, UK
Contact person: name, Tel., e mail:	Caroline Graham, +44 115 936 3391, c.graham@bgs.ac.uk

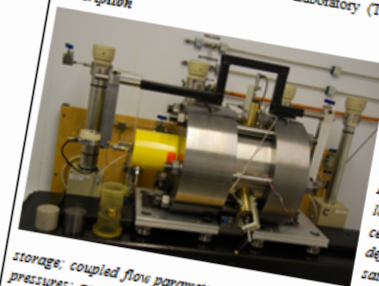
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Name of installation**

BGS Transport Properties Research Laboratory (TPRL)

Description



The TPRL is one of the leading centres for the study of fluid movement in ultra-low permeability reservoirs. The facility is well known within the research and industrial sectors for long-term high pressure experimental work and process-based in situ characterisation. Focus is on multi-phase flow in natural gas reservoirs, cements and engineered clays, and their deformation behaviour. Measurements include permeability and consolidation properties; in situ saturation and consolidation properties; in situ pressures; gas permeability function (e.g. osmotic permeability); capillary entry, breakthrough and imbibition properties. Laboratory experiments are performed under simulated in situ conditions (stress, pore pressure, temperature and chemical environment). Three key areas explored are: (i) baseline characterisation of permeability, (ii) influence of stress path and stress history on transport properties and (iii) quantitative data for mathematical modelling of ultra-low permeability materials. Tests are designed to understand key transport mechanisms. Key equipment includes: high pressure isotropic permeameter (70 MPa); constant volume permeameter (70 MPa); high-precision shear-rigs; high temperature, high pressure geochemical flow reactor (130 MPa at 140°C); novel tracer systems (nano particle injection or radiological tagging of gas) to characterise and identify potential migration pathways.

EU financed Transnational Access (TA) definition

‘Free of charge’ provision of **access to a research infrastructure to *selected* researchers or research teams (*including from industry*) usually working in a country other than the country where the RI is located.**

TA can be:

- **In person ('hands-on')**: users visiting the infrastructure, e.g. access to a research vessel or facility
- **Remote scientific services**: No visit needed, e.g. performance of sample analysis

*The **selection** of researchers or research teams shall be carried out through an **independent peer-review evaluation** of their research projects.”*

Independent Selection Panel: Peer Review Committee

Tasks:

- Selection of the proposal
- Allocation of the facility to prospective users
- Assessment reports will be made public via the web-site
- For rejected application, reasons and feedback will be given to applicant

Composition (experts nominated by the General Assembly):

- The Project Coordinator
- Internal Scientific Group from relevant partners (2-3 members)
- External Advisors from Industry, Academia and Research Institutions (3 members)

Principles:

- Transparency
- Fairness
- Impartiality

Independent Selection Panel: Peer Review Committee

Evaluation of the Transnational Access project proposals will be made in accordance with the **ECCSEL principles (scientific quality, relevance, and uniqueness)** and **selection criteria** developed during the preparatory phase.

Selection criteria:

- **Technology Readiness Level** (reviewed through Task 1.5 Innovation Management Tool)
- Level of Research and the extent the proposal will **produce new knowledge**
- **Scientific Merit** (Originality, Innovation, Methodology, State of the art)
- **Feasibility, Relevance**
- **Dissemination of results**
- **Ethical Perspective**
- **Environmental Impact**

Transnational Access - User obligations

The user of Transnational Access (TA) to the ECCSEL RI must:

- Use the ECCSEL **electronic application form** to apply for access under this TA program.
- Complete an ECCSEL **pre-research questionnaire** if their project has been selected before commencing research.
- Complete an ECCSEL **post-research questionnaire** after the visit of the research facility.
- Users must provide **a written report**, conforming to the rules specified by the European Commission, at the end of their visit (**1 page summary report and description of highlights of project results**). These reports will be submitted by ECCSEL to the Commission as **annual or final research project reports**, and **may be published** by the Commission.
- Users must also complete the **EU on-line survey** at <https://ec.europa.eu/eusurvey/runner/RIsurveyUSERS>.
- Complete the **travel and subsistence costs claim form** and submit the signed form together with the related receipts. **Payment** of travel and subsistence costs will only be completed after receipt of these and **after completion of the above listed documents**.

Access Costs for transnational access

Access costs: Costs incurred by the access provider for the provision of access.

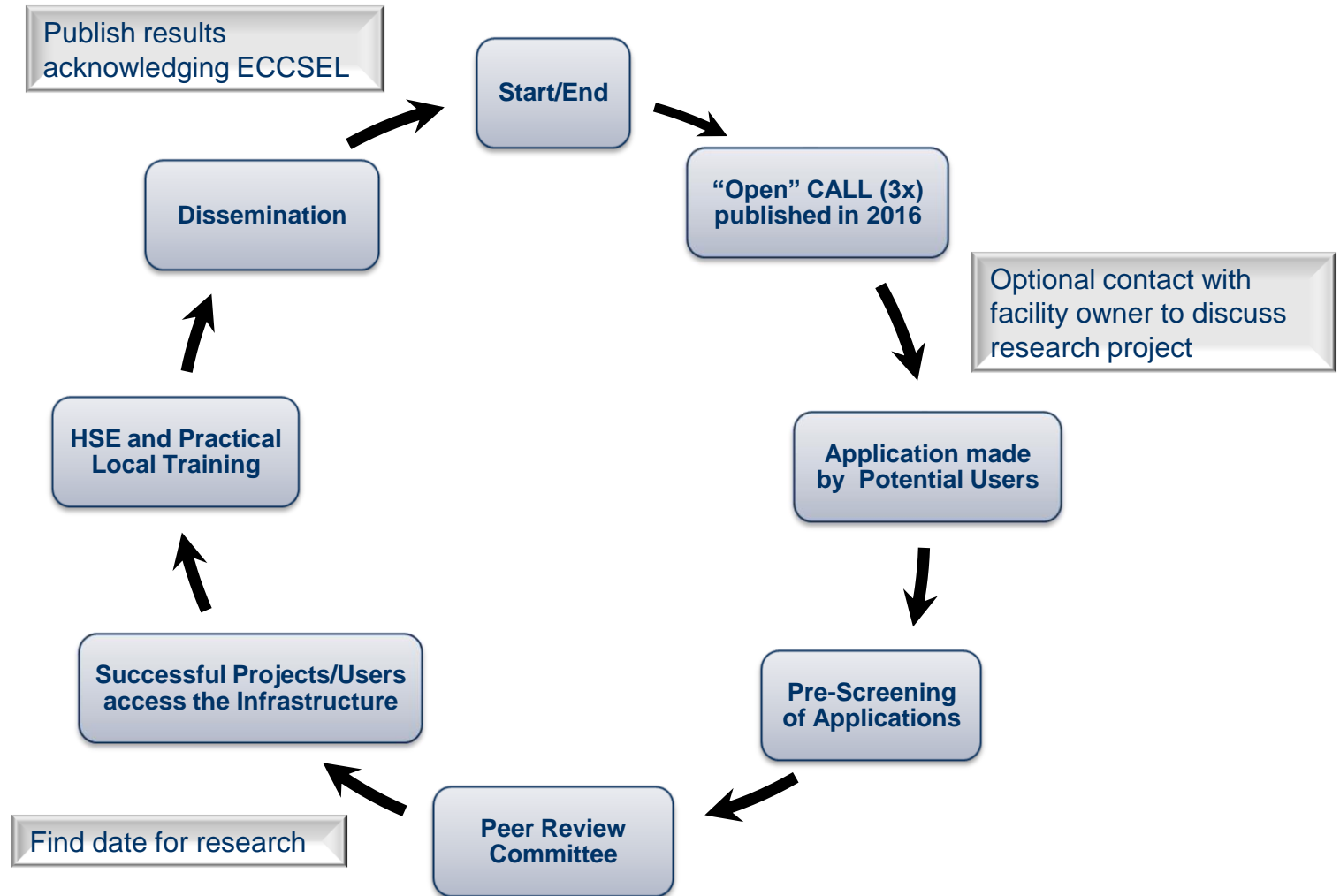
They cover:

- *The **running costs** of the installation*
- *Costs for **logistical, technological and scientific support** to users' access, including **ad-hoc training** and **preparatory and closing activities** necessary to carry out user's work*

Researcher expenditure:

Covers travel, subsistence

Transnational Access (funded by the H2020 Infradev3 Project)





Thank you for the attention!

www.eccsel.org

How much access is available ?

At least one EU funded access to each of the included facilities

- Typical time for a research project is listed on fact sheet
- Reasonable Travel and Subsistence funding for one researcher
 - Up to € 500 for travel
 - Up to € 100 for each day at the facility
 - Travel claim with receipts must be submitted
- Access is also available to all those facilities and some additional which will be listed soon to researchers paying the access costs

Transnational Access - Access provider obligations

- **Publicise** widely the **access offered** under the grant agreement and the modalities to apply
- Take into account the **gender dimension** in advertising the access and defining the support provided to users
- Set up an **independent selection panel** to select the users to be supported
- Maintain & **provide to EC appropriate documentation** to support and justify the amount of access reported (name, nationality and affiliation of users; nature and quantity of access provided to user teams, selection panel members & selection procedure)
- *A measurable unit of access for each installation must be identified and clearly defined in Annex I to the GA*

Independent Selection Panel: Peer Review Committee

Other Selection Criteria:

- Users (groups) need to be entitled to disseminate results they have generated under the project
- Priority should be given to user groups:
 - Who have not previously used the infrastructure
 - Who are working in countries where no such infrastructures exist

Transnational Access - User obligations II

The user of Transnational Access (TA) to the ECCSEL RI must:

- Declare the **composition of any chemicals** they might want to bring with them to an ECCSEL research facility to use in their research project.
- **Acknowledge in their publications** that their work was financially supported by the **European Union's Horizon 2020** Research and Innovation Programme by displaying the **EU emblem** and including the following **text**: "This [insert type of research/result] has been done (achieved) using the ECCSEL RI and is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 675206"
- Shall **abide by the normal working practices**, working hours, and health and safety regulations of the visited facility while present at the site.
- The Infrastructure or facility shall incur no liability in respect of any claim that may arise from the use of its facility under this contract. **The presence of Users in the facility occurs at their own risk.** Neither the personnel of the facility nor the facility or Research Infrastructure itself accept liability for the damage or loss of any instruments, apparatus and test equipment of the Users whether or not such damage or loss was caused directly or indirectly by their negligence. **Each visiting user will ensure he/she has appropriate insurance**, including personal health, accident cover and personal liability. The Research Infrastructure may conclude an access contract with the leader of a user group.