



***European Carbon Dioxide  
Capture and Storage Laboratory Infrastructure***

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# Vision and Objectives

**ECCSEL vision:**

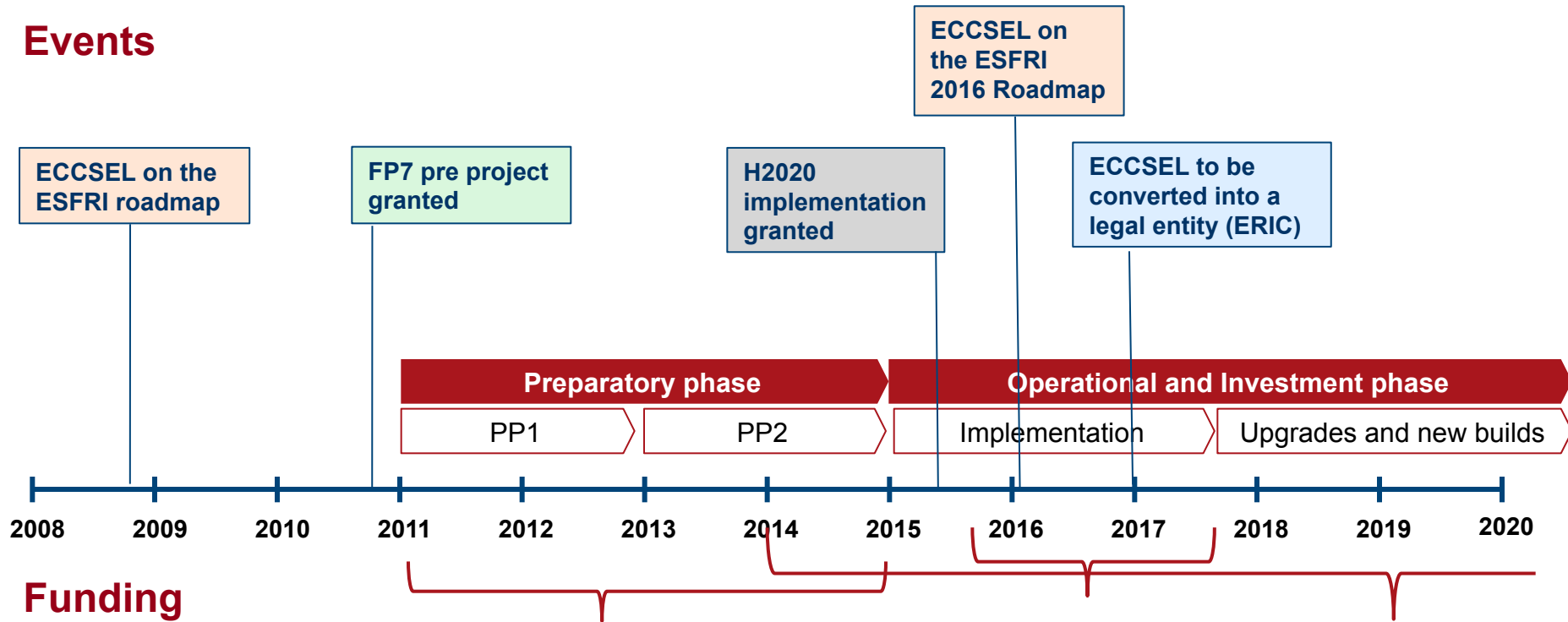
*Enabling low to zero CO<sub>2</sub> emissions from industry and power generation*

## The main objectives of the ECCSEL initiative

- Establish and operate a world class distributed Carbon Capture, transport and Storage (CCS) research infrastructure in Europe
- Integrate and upgrade existing research facilities and supplement with new ones
- Enhance European science, technology development, innovation and education in the field of CCS
- Enable spin-off activities and generation of new business

# ECCSEL Timeline

## Events



## Funding

### Project funding PP1/PP2

- EC FP7: 2.5 MEUR
- RCN/CLIMIT: 1 MEUR
- Other partners: 1 MEUR

### Horizon 2020 Infradev-3 funding

- 3,3 MEUR

### Infrastructure investments (until 2030)

- 200+ MEUR (Funded by EU, member states, funds, industry...)

# INFRADEV-3 Implementation

## ECCSEL preparatory phase

- Legal & governance
- Financing strategy
- Infrastructure development plan
- Access Policy & IPR
- Communication
- Outreach strategy
- Business Plan



**H2020 Infradev3 Consortium (2015 - 2017)  
with 43 research facilities/installations**

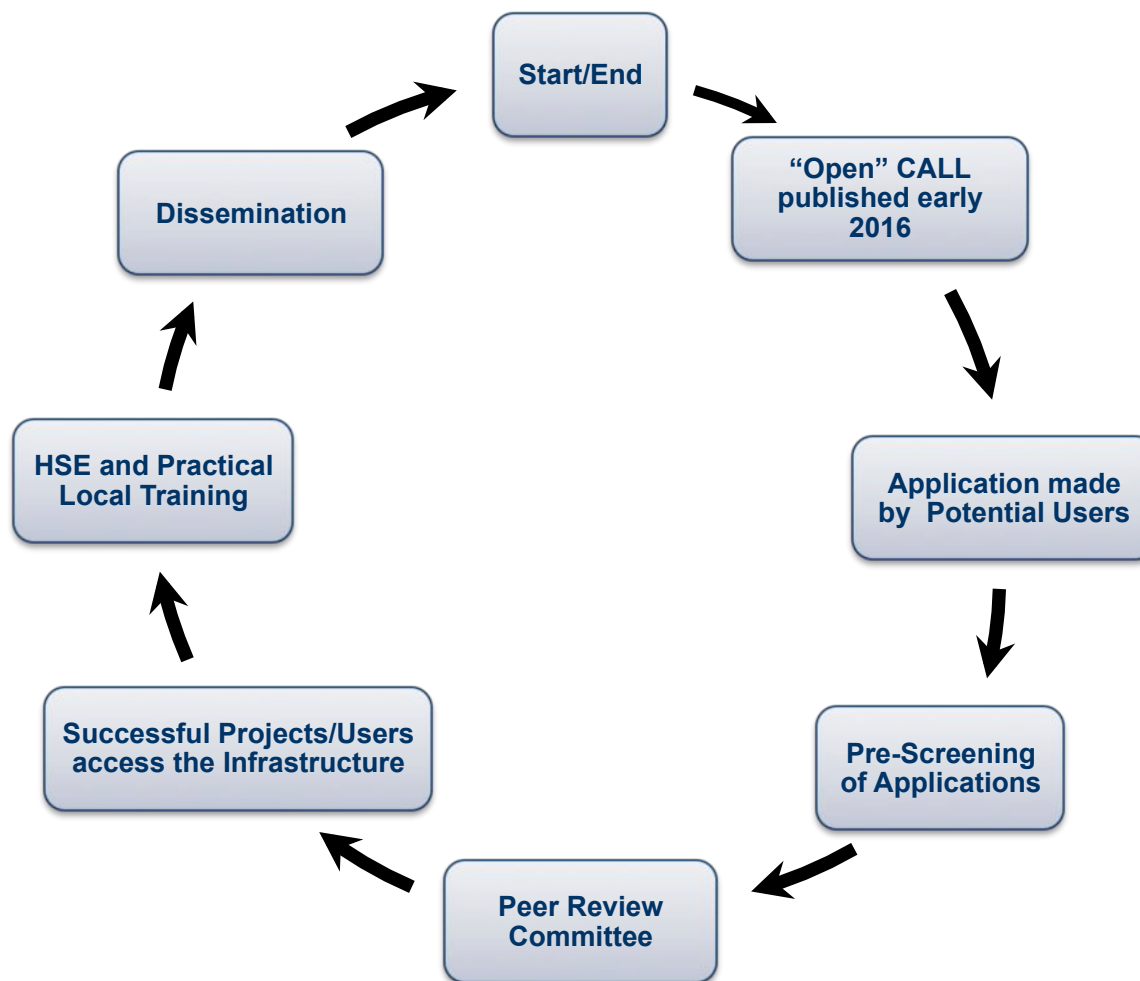
# INFRADEV-3 Transnational Access - Storage

Institution	Country	Number	Short Name & link to fact sheet	Long Name	Access unit	Unit quantity
BGS / NERC	UK	TA3.4	Gas Mon	Near-Surface Gas Monitoring Facility	week	4
BGS / NERC	UK	TA3.3	HTL	Hydrothermal Laboratory	month	1
BGS / NERC	UK	TA3.2	RMPL	Rock Mechanics and Physics Laboratory	week	4
BGS / NERC	UK	TA3.1	TPRL	Transport Properties Research Laboratory	month	1
BRGM	FR	TA14.1	BIOREP	Monitoring of microbiological and geochemical processes in high pressure and dynamic conditions	month	1
CERTH	GR	TA 9.2	CERTH Storage facilities	CO2 Storage facilities	week	3
CIUDEN	ES	TA5.3	Hontomin TDP	Technology Development Plant for CO2 Storage	week	1
CIUDEN	ES	TA5.1	PISCO2	Pilot for Injection of CO2 in Soils	week	3
ETH Zürich	CH	TA11.4	ETH Conf-Perm	High pressure hydrostatic flow cell	month	1

# INFRADEV-3 Transnational Access - Storage

Institution	Country	Number	Short Name & link to fact sheet	Long Name	Access unit	Unit quantity
OGS	IT	TA7.2	Aircraft	CURRENTLY NOT AVAILABLE	NOT	AVA
OGS	IT	TA7.3	BioMarineLab	Ecological laboratory for microcosm / mesocosm experiments	day	10
OGS	IT	TA7.1	DeepLab	DeepLab Sea Floor Landers for meteoceanographic physical and geochemical data collection	day	5
OGS	IT	TA7.1a	Panarea Natural Laboratory	Study the impact of CO2 on benthic organisms and marine ecosystems	day	5
PGI-NRI	PL	TA6.2	GEOPH-Lab	GEOPH-Lab	week	2
PGI-NRI	PL	TA6.1	PETRO-Lab	PETRO-LAB	week	2
SINTEF PETRO-LEUM AS	NO	TA13.2	SINTEF PR – pVT	Fluid (pVT) laboratory	day	30
SINTEF PETRO-LEUM AS	NO	TA13.1	SINTEF PR – SCAL	Core Flood (SCAL) laboratory	day	30

# Transnational Access (funded by the H2020 Infradev-3 Project)



# Infrastructure Investment plan – Capture (extract)

<i>Item</i>	<i>Plans for upgraded and new capture facilities</i>	<i>Priori-ty</i>	<i>Category</i>	<i>Budgeted investme nt cost in million €</i>
20	High temperature membranes for CCS – NO	Approved	Upgrade	1.05
21	Low temperature separation pilot – listed under CAT 1 due to completion early 2017 – NO	Approved	New	1.30
22	Cryogenic distillation and flash separation columns - NO	P a r t i a l l y A p p r o v e d P l a n n e d	/ Upgrade	
23	Integration of the existing COHYGEN plant with a new column for CO2 capture with liquid solvents – IT	U n d e r C o n s t r u c t i o n	Upgrade	
24	CO2-to-liquids pilot plant – IT	U n d e r C o n s t r u c t i o n	New	
25	Bench-scale plant foe CO2 separation by membranes – IT	U n d e r C o n s t r u c t i o n	New	



# Infrastructure Investment plan - Transport

<i>Item</i>	<i>Plans for upgraded and new transport facilities</i>	<i>Priority</i>	<i>Category</i>	<i>Budgeted investment cost in million €</i>
1	Industrial dynamic CO <sub>2</sub> transport development	High	Upgrade existing	0.25
2	Experimental facility to test various properties of CO <sub>2</sub> and mixtures with CO <sub>2</sub> : phase behaviour including hydrate formation, liquid phase density, viscosity, thermal conductivity, speed of sound in liquid phase, surface tension, diffusion coefficients and heat capacity. Large span of temperature and pressure.	High	New	5-8
3	COOTRANS Transport Loop, – currently in design stage – FR	<b>Planned</b>	New	8.97
4	Combined site for testing of crack arrest and gas release from CO <sub>2</sub> pipeline – NO	<b>Planned</b>	New	1.27
5	High pressure phase equilibria apparatus – NO	Approved	New	0.84
6	Test rig for solid phase low-temperature equilibria – NO	Partially Approved / Planned	New	0.63

# Infrastructure Investment plan - Storage (Extract of 27 facilities)

Item	Plans for upgraded and new storage facilities	Priority	Category	Budgeted investment cost in million €
1	A nature-based laboratory for assessing fracture controlled migration. Objective is to assess reservoir and caprock geomechanical responses at a small field scale. → Mont Terri (Switzerland) is a possible candidate site.	High	Upgrade existing	3-5
2	Storage pilots to investigate injection strategies to meet likely CO <sub>2</sub> supplies in a range of storage types. → Hontomin and Svalbard could be potential candidates.	High (main priority)	Upgrade existing	2-3
3	A pilot scale research facility for injection into a fracture to study migration and attenuation processes during migration through the overburden. Challenges could be site identification and permitting. → Hontomin (Spain), Sulcis (Italy) and Svalbard (Norway) may be possible candidates.	High	New or upgrade existing	3-8
4	Facility to simulate leakage for developing models and integrated monitoring technologies for offshore storage. → No storage site needed.	High	New	3-8
5	Experimental Geochemistry – UK	Planned	Upgrade	
6	AUV-based atmospheric detection of CO <sub>2</sub> - UK	Planned	Upgrade	
7	GeoEnergy Test Bed – UK	Planned	Upgrade	
8	Laterna Natural Lab- under development – listed under CAT 1 due to completion end 2016 – IT	Under Construction	Upgrade	

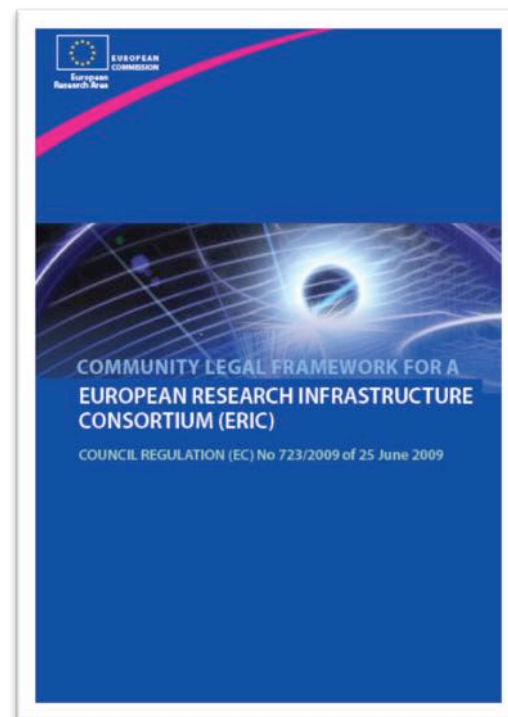
# ECCSEL legal entity:

## ERIC (European Research Infrastructure Consortium )

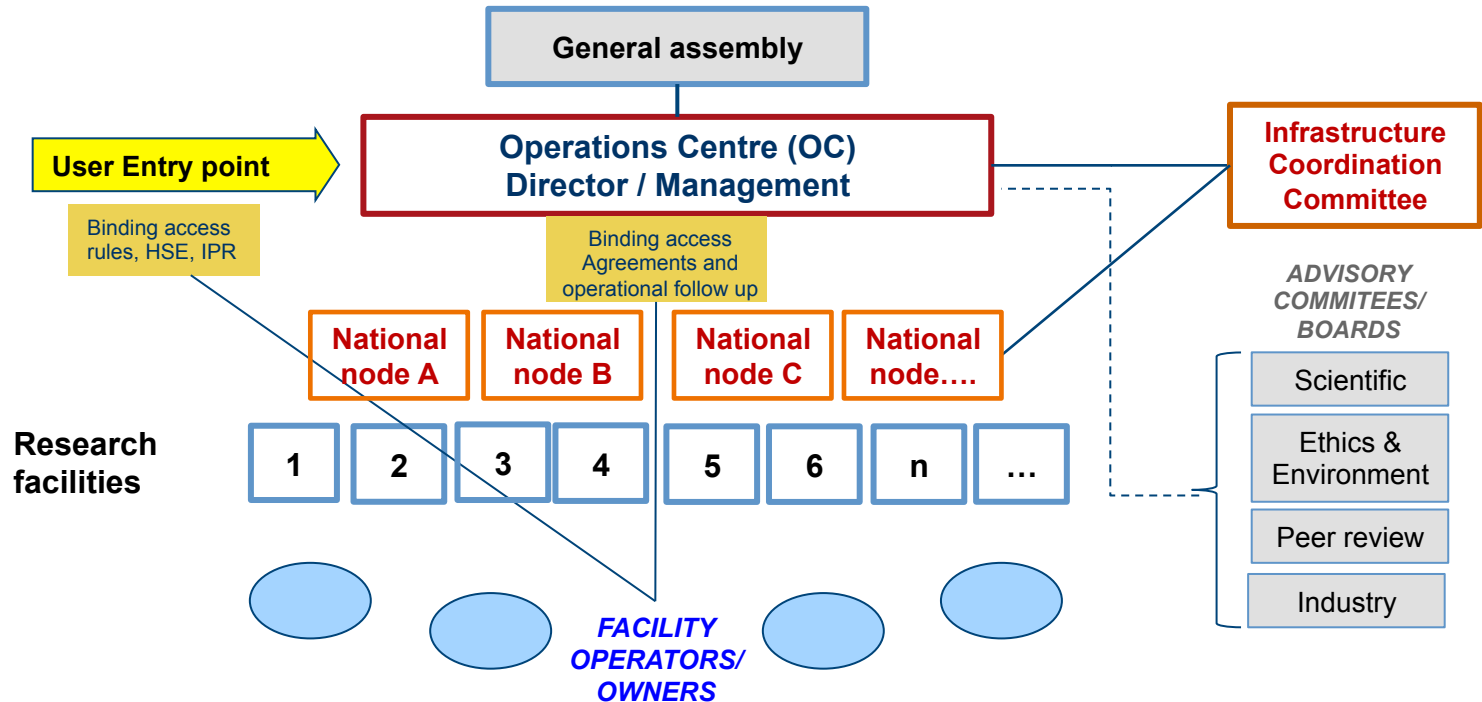
Application to be approved by the European Commission

- Statutes
- Technical & Scientific Description
- Minimum three Founding Members
- 5 year budget
- Governmental membership/commitment required

Final application to be sent early June with expected approval and ECCSEL ERIC start-up by the end of 2016



# ECCSEL ERIC Organisation structure

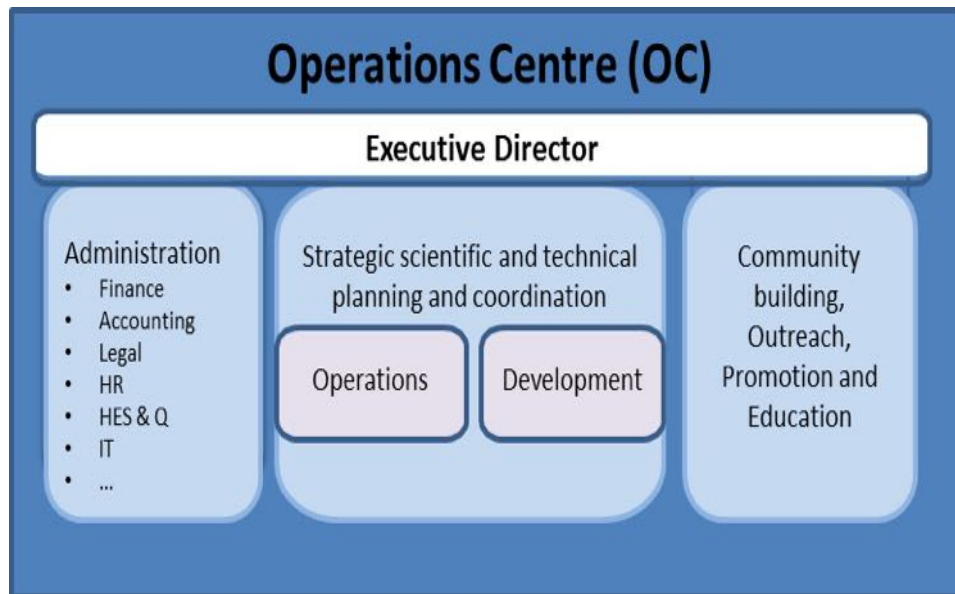


National node contact (appointed by corresponding member state) main responsibilities/tasks:

- Linking national CCS RI roadmaps to ECCSEL ERIC RI development plans and decisions/recommendations
- National coordination and follow up of recommendations/actions on behalf of the OC

# ECCSEL ERIC Operations Centre

## - responsibilities and tasks



### Lean organization:

- 4-6 employees
- Annual budget  $\approx$  850.000 EUR

Including in-kind contributions

### Location:

NTNU/SINTEF Campus  
Trondheim, Norway

# Expansion

## ECCSEL Membership Development Plan

### Preparatory Phase (2011-2014)

#### Norway (host)

- NTNU, SINTEF, RCN

#### France

- IFPEN, BRGM

#### The Netherlands

- TNO

#### Germany

- Universität Stuttgart

#### United Kingdom

- BGS

#### Switzerland

- ETH Zürich

#### Spain

- CIUDEN

#### Italy

- OGS, ENEA

#### Greece

- CERT, ISFTA

#### Poland

- PGI-NRI

### Implementation (2015-2017)

- **Norway**  
(Operations Centre)
- **The Netherlands**
- **Spain**
- **United Kingdom**
- **Poland**
- **Italy**
- **Greece**
- **France**
- **Switzerland**  
(ERIC observer)

All have signed Letter of Intent to join ECCSEL and transition MoU agreements until an ERIC is established

### Expansion

- Germany
- Czech Republic
- Other member states
- Bilateral agreements with oversea states, institutions, industry



*Thank you for the attention!*

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