

Présentation de l'ERIC ECCSEL

Séminaire National CSCV

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Vision and Objectives

ECCSEL vision:

Enabling low to zero CO₂ emissions from industry and power generation

“The mission of ECCSEL is to provide open access for researchers and engineers from across the globe to a world-class European Research Infrastructure devoted to the **development of technological solutions to reduce CO₂ emissions** from industry and power generation, as well as to remove CO₂ from the atmosphere, in order to reach climate neutrality.”

The main strategic objective of ECCSEL is to facilitate and accelerate research and development of **CO₂ capture, transport, utilisation and storage (CCUS)** technologies, expanding towards **large-scale Energy Storage in the underground**. Synergies with the development of **renewable energy and hydrogen energy** are strongly addressed.

Activités et services fournis

- European Research Infrastructure Consortium (ERIC) et **Landmark** européen.
- **Représenter une communauté scientifique** et sa thématique à l'échelle européenne tant au niveau des institutions (ESFRI, CE, ministère) que des autres IR (ERIC Forum, EOSC...)
- **Coordonner la gestion des données** de cette communauté et contribuer aux missions Open/FAIR de l'Europe.
- **Coordonner et faciliter l'accès aux plateformes** de recherche de ses membres ainsi qu'aux services associés
- Stimuler le développement et la mise à jour de ses plateformes afin de **répondre aux critères d'excellence** des IR ainsi qu'aux demandes des utilisateurs
- Favoriser les **synergies et collaborations** avec d'autres communautés
- Etablir une vision, des ambitions et **une stratégie commune**



The ECCSEL ERIC Operations Centre



Organisation growth from 2017 - 2022:

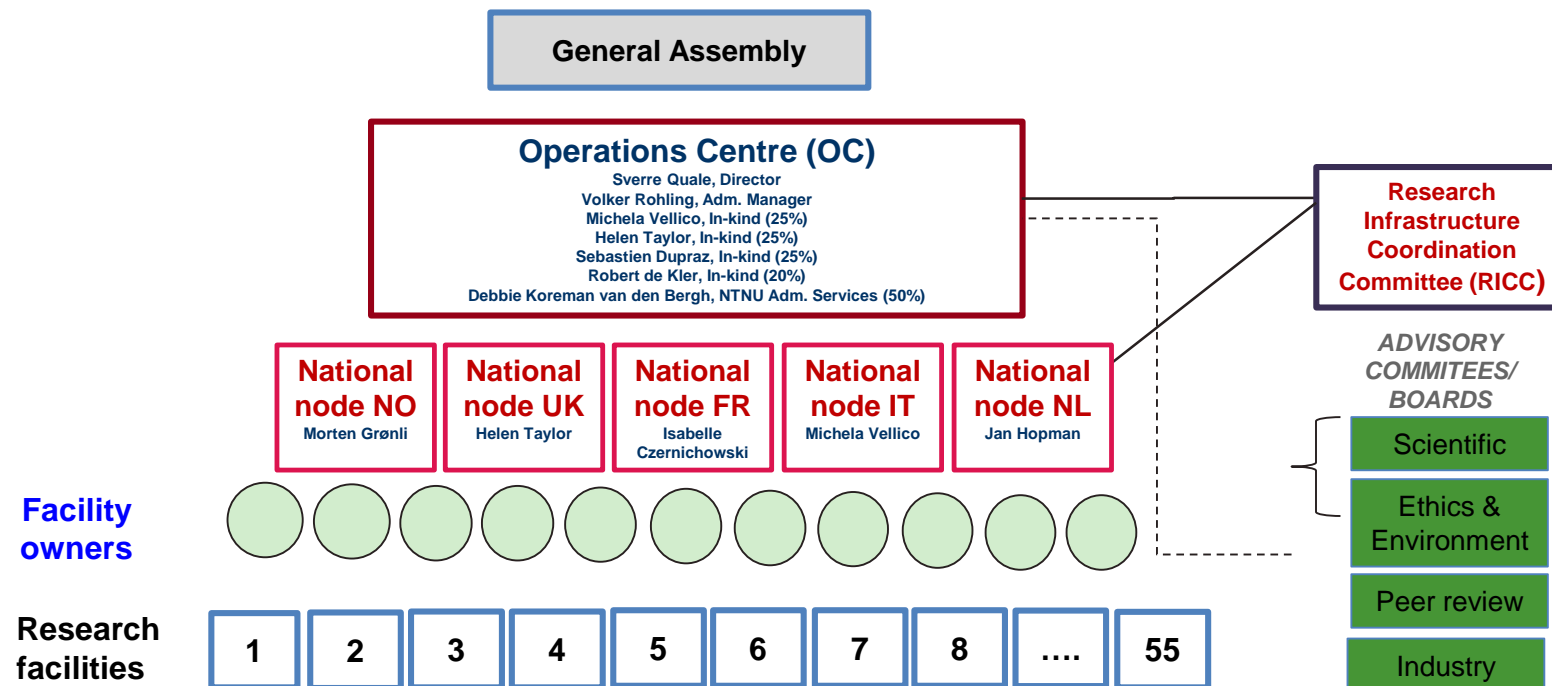
- 4 - 7 employees
- Annual budget 400.000 - 850.000 EUR including in-kind contributions



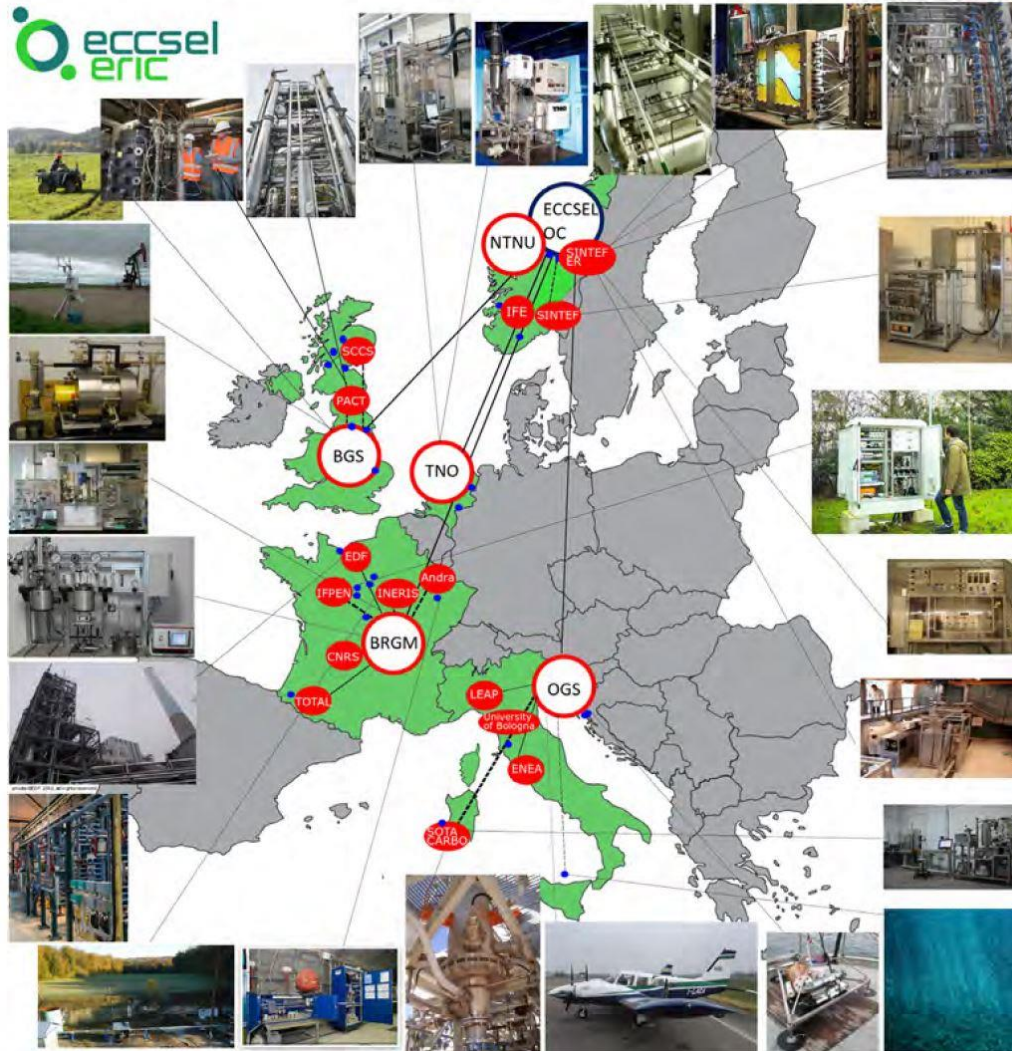
Location:

NTNU/SINTEF Campus
Trondheim, Norway

Organisation



5 countries
23 facility
owners / legal
entities
88 facilities
1 Research
Infrastructure



Partners and Countries:



Italy: OGS, SOTACARBO, ENEA, UNIBO-DICAM, LEAP



France: BRGM, ANDRA, EDF, IFPEN, INERIS, CNRS



Netherlands: TNO



Norway: NTNU, SINTEF ER, SINTEF AS, IFE



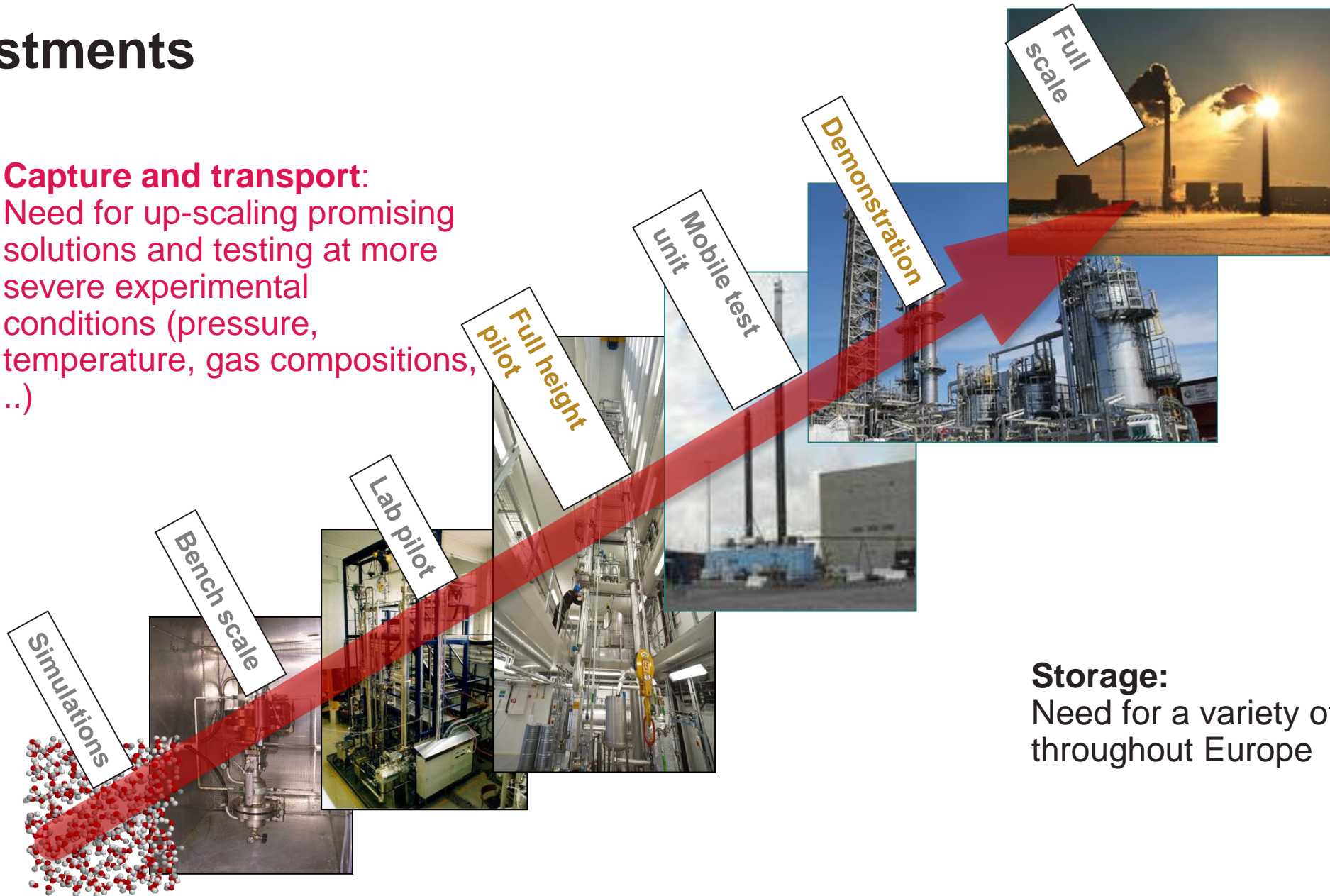
UK: BGS, TERC, UOEDINBURGH, HWU, UOABERDEEN, UOSTRATHCLYDE, TUV-NEL



Investments

Capture and transport:

Need for up-scaling promising solutions and testing at more severe experimental conditions (pressure, temperature, gas compositions, ..)



Storage:

Need for a variety of test/pilot sites throughout Europe

Utilisation in ECCSEL

- Tous les types d'utilisation du CO₂ sont considérés du moment qu'il s'intègrent dans un schéma ou une stratégie de réduction des gaz à effet de serre.
- Comme dans le cadre des autres procédés, tous les TRL allant de 2 à 8 sont couverts

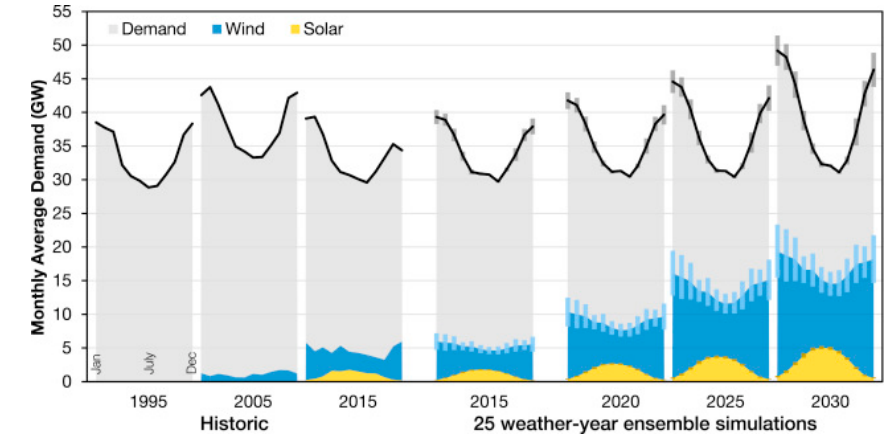
Technology overview from industry workshops

	Carbon Capture			Utilisation		
	Solid Adsorption	Liquid Absorption	Membrane / Others	Direct usage	Fuel production	Building block
Cement	Calcium looping (TRL 7)	Post-combustion capture using amine systems (TRL 7)	Oxy fuel combustion (TRL 6) Indirect heating (TRL 6) Heating with hydrogen (TRL 6)		Methane with added hydrogen (TRL 6-7)	Mineralisation to cementitious material (TRL 6)
Petrochemistry		Amine based capture of SMR outlet for blue hydrogen (TRL 7) physical absorption of ATR/POX outlet for blue hydrogen (TRL 9)	Heating with hydrogen (TRL 6)	Delivery to greenhouses (TRL 8)		
Iron & Steel	Sorbent based capture on the off gases with additional hydrogen recovery (TRL 6)	Amine based capture on the off-gases (TRL 7)	Direct reduction of iron with low-carbon hydrogen (TRL 7)		Methanol with hydrogen (TRL 6), Ethanol (TRL 8)	Naphtha from CO and hydrogen (TRL 6) Urea (TRL 9) Direct conversion of off-gases to polyol intermediates (TRL 4-6)
Waste-to-Energy	-	Post-combustion amine based capture (TRL 7)	Membrane separation of CO ₂ (TRL 4)	Delivery to greenhouses (TRL 8)		Production of sodium bicarbonate (TRL 7)

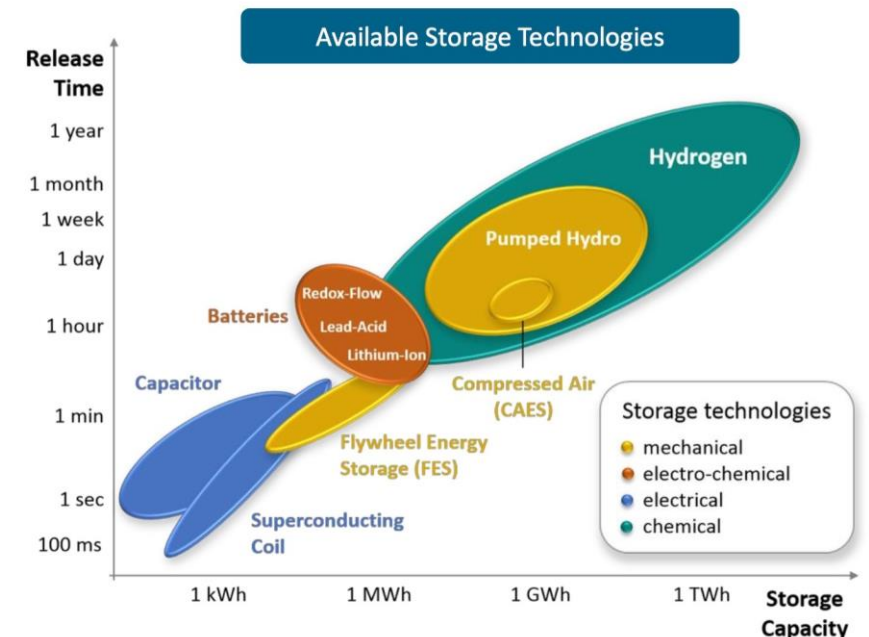
	TRL 4
	TRL 6
	TRL 7
	TRL 8

Storing Hydrogen

- Needs of regulation for supply regarding seasonal demands and natural variations (green hydrogen being produced by sustainable means)
- And...additional wind/solar electricity storage demands that cannot be handled by compressed air or pumped-storage (already saturated).
- For economic and security reasons, those large storage demands are mainly addressed with underground reservoirs (Underground Hydrogen Storage or UHS)



Staffell and Pfenninger 2018



UHS technologies

- Depleted gas and oil fields
- Aquifers
- Salt caverns
- Excavated caverns



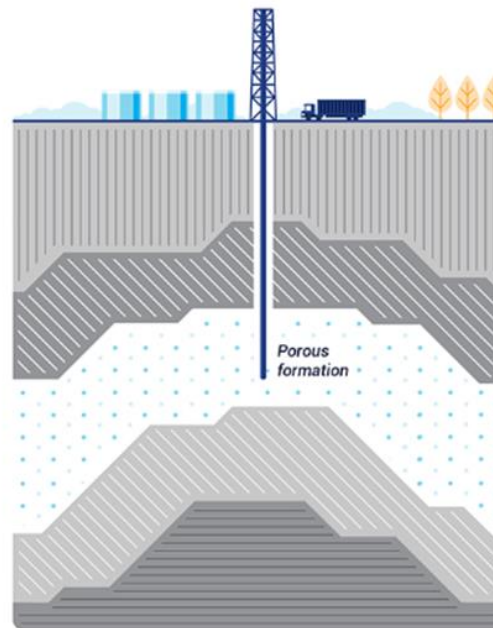
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IN DEPLETED GAS AND OIL FIELDS

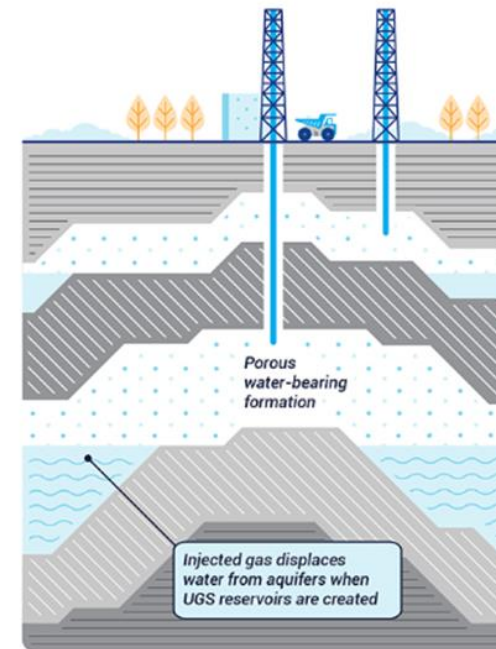
This type of reservoir is the most suitable for creating UGS facilities

- + The field is fully explored: its geometry, the shape of its gas-bearing area, and the tightness of its cap rock are known
- + The previously built wells and infrastructure can be used for gas storage purposes



IN AQUIFERS

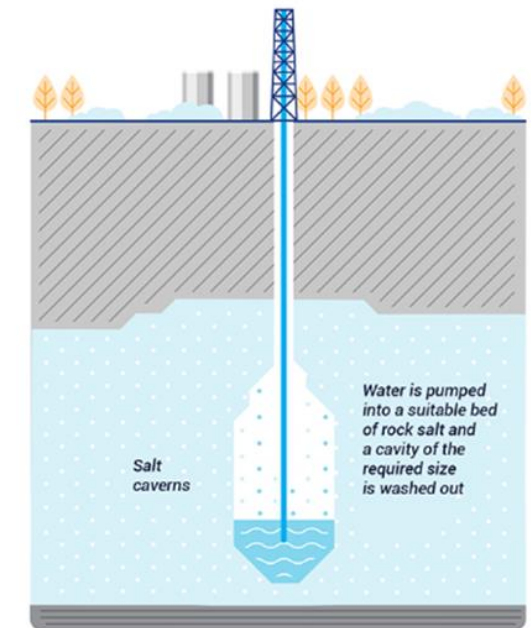
Porous water-bearing formations with tight impermeable cap rocks can be used as UGS reservoirs



IN SALT CAVERNS

Salt caverns can be used for storing not only gas but also liquid hydrocarbons

- + Salt caverns are ideal leak-proof containers thanks to their gas-tight salt domes
- + UGS facilities based in salt caverns have the highest daily deliverability



Pourquoi intégrer ECCSEL?

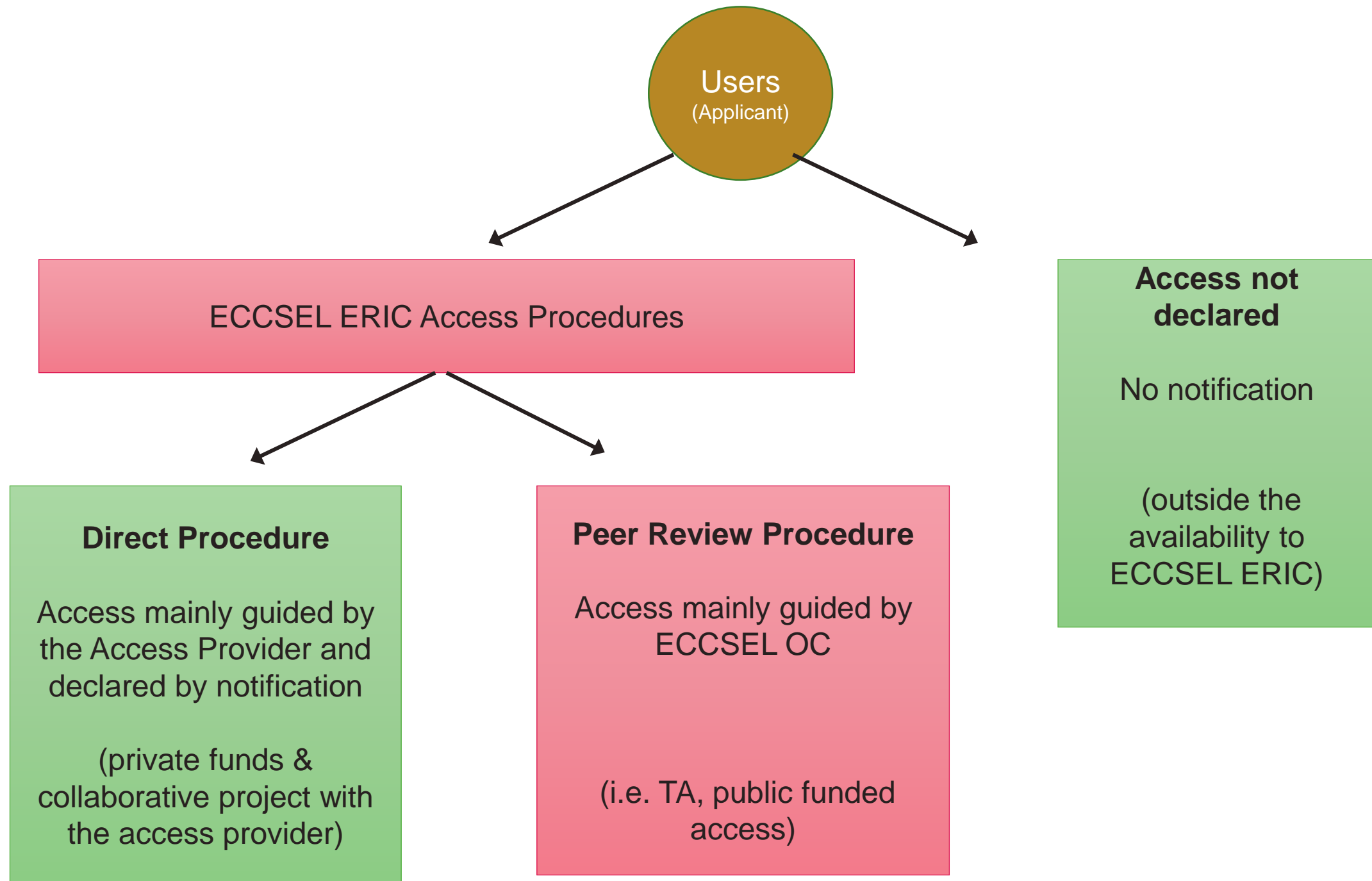
- **Visibilité, attractivité** de vos plateformes, : au niveau national via la FDR des IR et au niveau international via la FDR ESFRI et les moyens de communication d'ECCSEL
- **Professionnalisation** et simplification de l'accès par des tiers. La sécurisation de la mise à disposition de vos plateforme via une politique d'accès et un cadre administratif solide (SLA, AP)
- La possibilité de pouvoir contribuer à des **projets** nationaux (CPER, PIA...) et européens **spécifiques aux IR**. Accès facilité à des fonds européens ou nationaux pour leur modernisation ou la construction de nouvelles plateformes de recherche (type INFRADEV)
- **Influence** sur la stratégie nationale des infrastructures de recherche et sur les stratégies nationales concernant le CSCV et le stockage énergétique souterrain (notamment via les alliances et PIA).
- Influence sur les décisions, priorités et activités de l'ERIC ECCSEL : établir des **stratégies communes**, harmoniser les éventuelles concurrences, construire des services multiplateformes...



Mais aussi...

- Des moyens et synergies pour construire une **politique de gestion des données commune** (Open & FAIR) et des services associés
- Un cadre collégial de **formation et de renforcement des capacités**
- **Revenus** par la mise à disposition de vos plateformes aux chercheurs européens ou du monde entier. La participation à des projets H2020 d'ERIC et le financement d'accès transnationaux (ex: Ritrain, Stories, ECCSELERATE)





Transnational Access calls

First call – Industry Access

Call opening: September 2021 to June 2022

- Industrial companies and SMEs are eligible to apply
- Research is open to all Technology Readiness Levels
- The Transnational Access project can be merged with other ongoing activities
- Monthly review of the proposals

Target groups for the Industry Access call

The call is open for researchers from all industrial sectors. Research in collaboration between industry and universities or research institutes will also be eligible.



<https://www.eccsel.org/media/112621/transnational-access-indutry-call-2021.pdf>

Procédure d'entrée

Transnational Access

Fact sheets (web)

- Organisation name
- Installation name
- Location (Google map)
- Category, Science area
- Short description
- State of the art
- Equipment available
- Pictures
- (Calendar (availability) - not yet implemented)

Fact sheets pdf

