



The European Network
of excellence on the
Geological Storage of CO₂

CO₂ -storage research activities on a national, regional and European level

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Outline

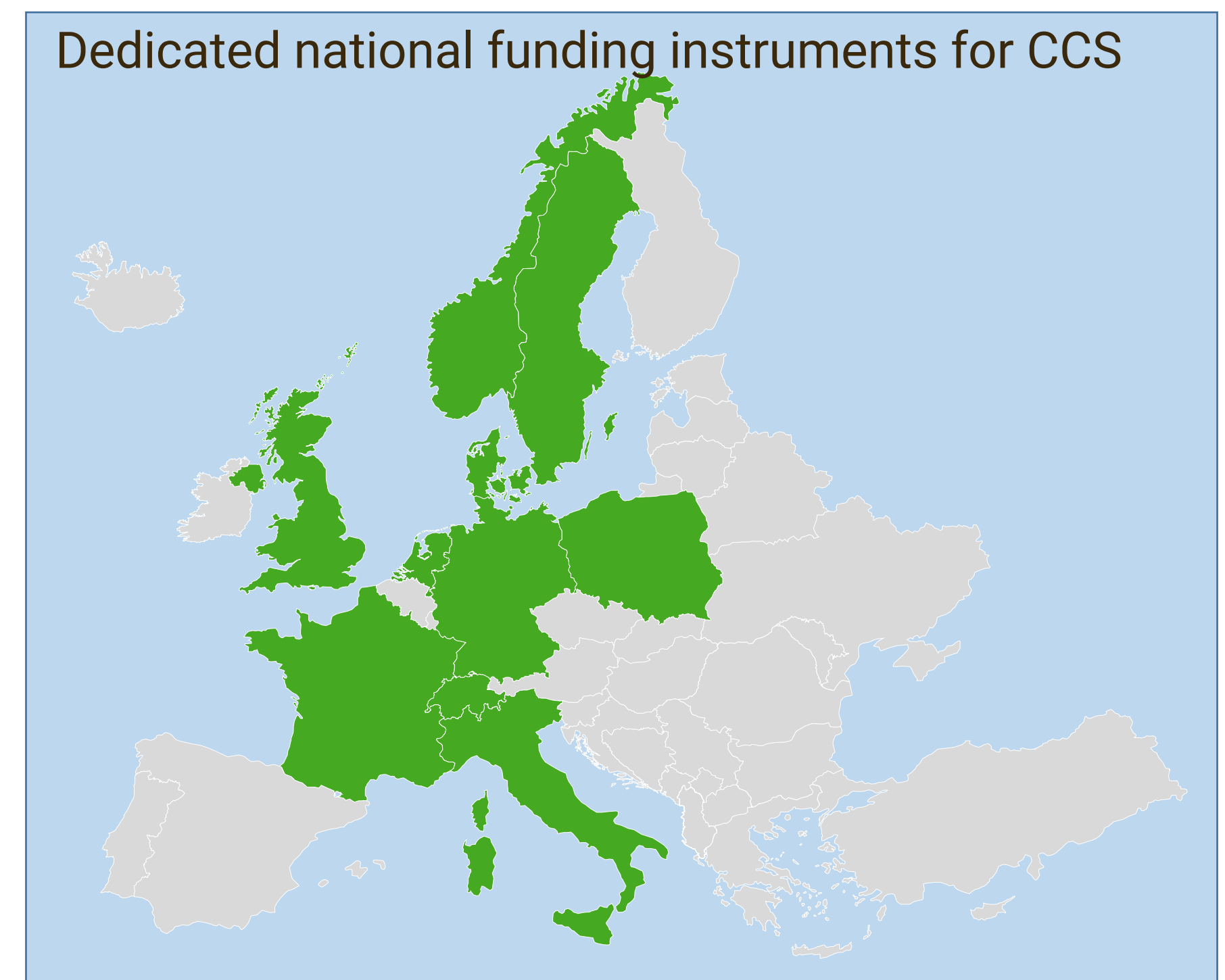
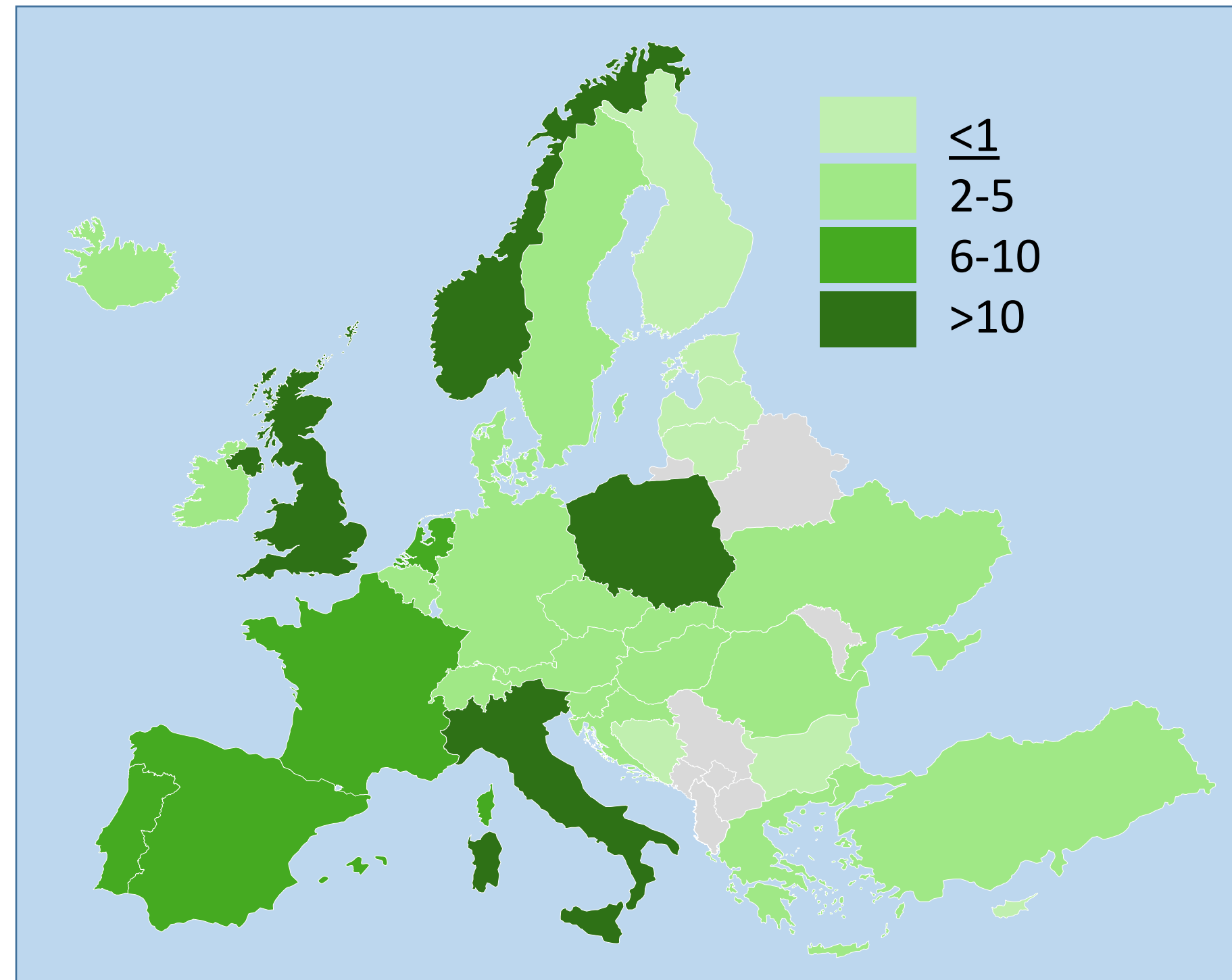
- Research institutions
- FP7 and H2020 projects 2013-2020
- Other Multinational/regional projects
- Europe-wide engagement
- National CCS-related research efforts
- Global engagement



Research institutions



Research Institutions



152 research institution involved in CO₂-storage-related research in 32 European countries

Centralisation of research in some countries



FP7 and H2020 projects 2013-2021



Other multinational/regional CO2 storage research projects 2013-2021



EERA – European Energy Research Alliance

Research pillar of the European Strategic Energy Plan (SET)

Task of aligning R&D activities of individual research organizations with SET plan priorities.

Joint Programme CCS

Sub programmes on CO₂ capture, transport and storage

Storage sub programme organized into

Monitoring

Static modelling

Dynamic modelling

Close cooperation with the European CCS Research infrastructure (ECCSEL) and the European Zero Emissions Technology and Innovation Platform (ZEP).

EERA supports H2020 CCS projects

Builds collaborations outside Europe



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ACT – Accelerating CCS technologies

Initially an ERA NET Co fund through H2020 and then entirely funded by participating countries

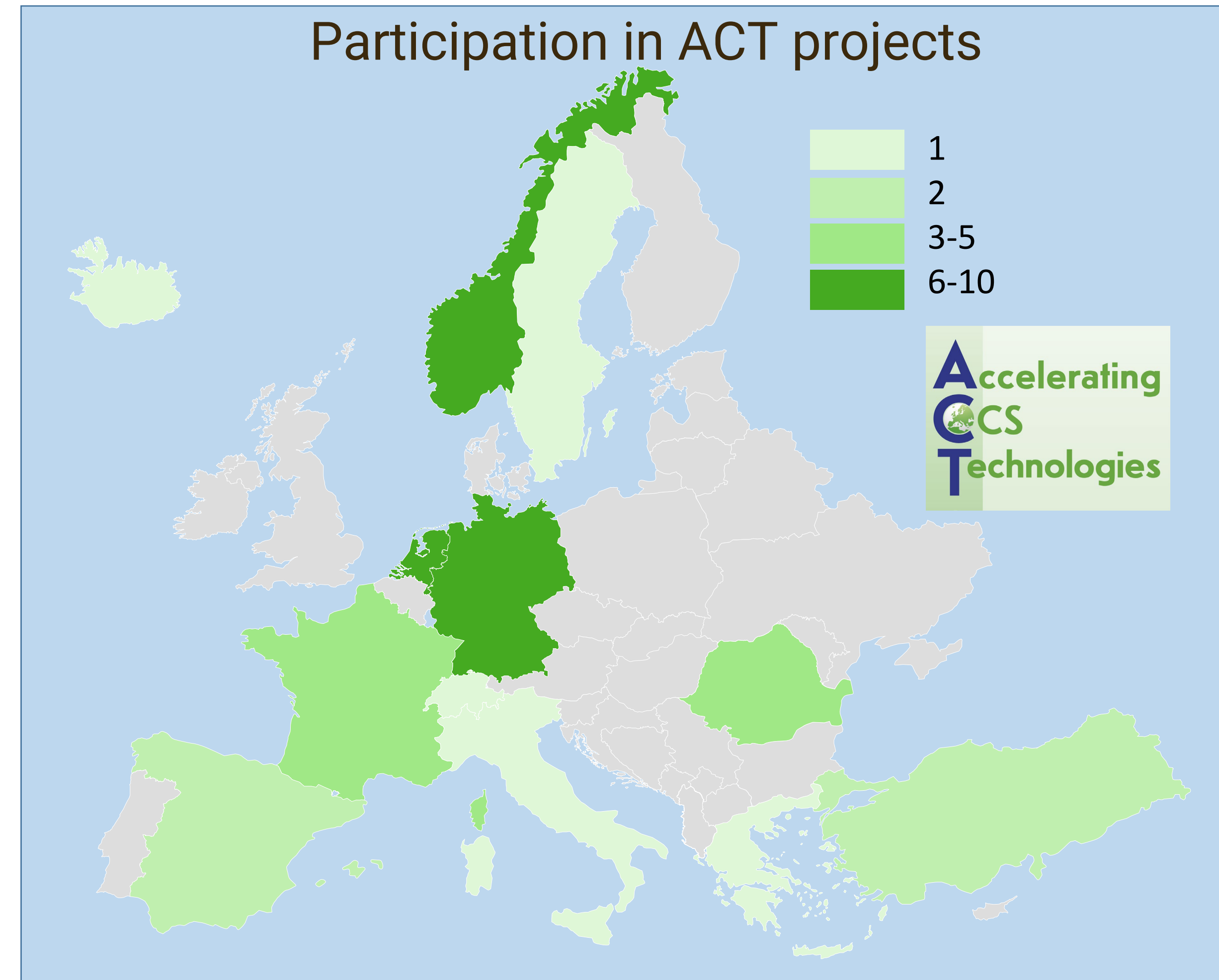
Key topics

- Monitoring
- Storage capacity assessment
- Land planning and infrastructure

Eleven storage-related projects funded between 2017-2020 (see map)

Four storage-related projects funded from 2020 call Recently announced

- CEMENTTEGRITY – Well cements for improved integrity and sealing
- ENSURE – Microseismic monitoring
- RETURN – Safe and cost-efficient storage in depleted O & G fields
- SHARP – Improved assessment of rock stress and failure scenarios



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RFCS - The Research council for Coal and Steel

Supports research and innovation within coal and steel industry

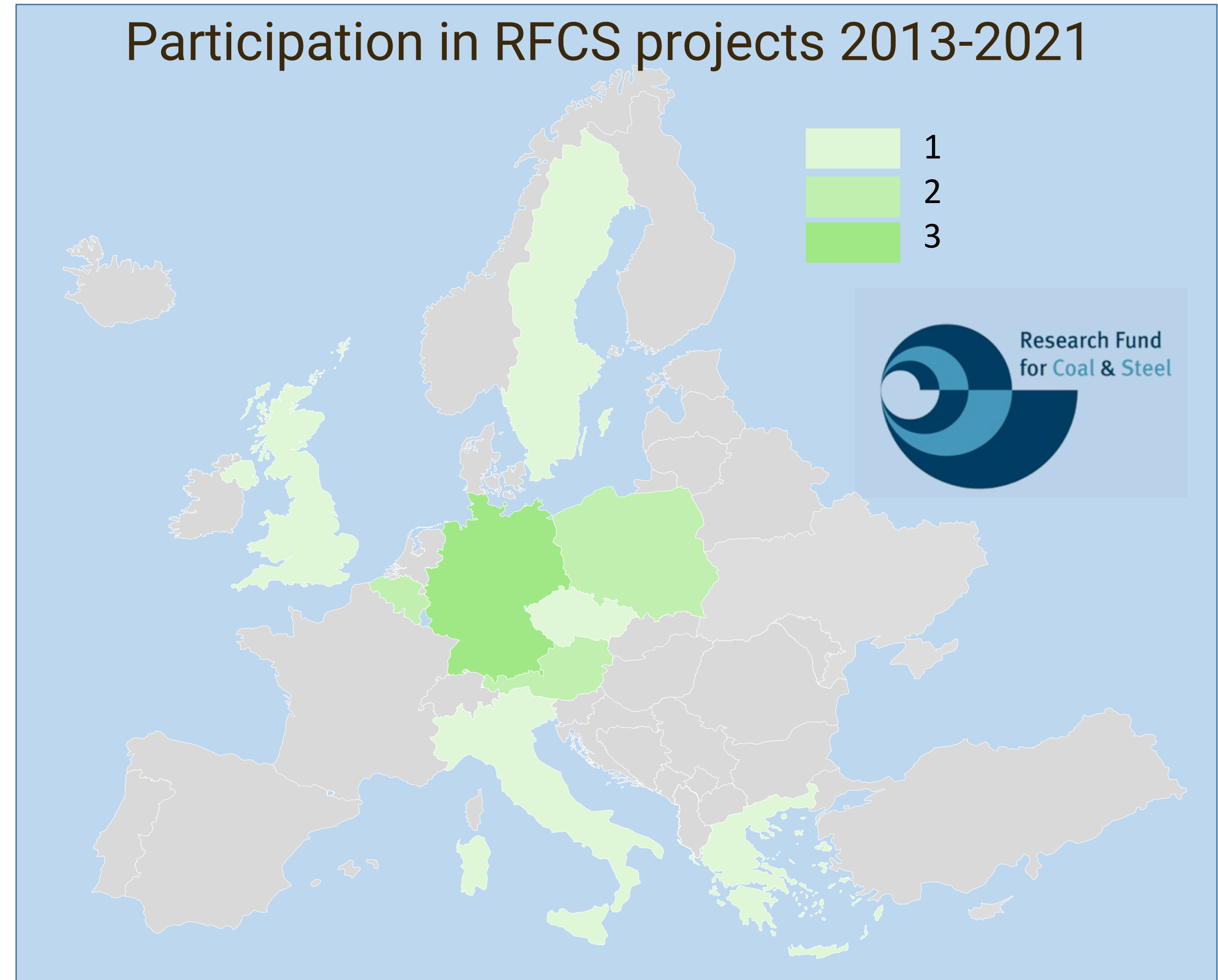
Aligns with European green Deal, supporting zero-carbon steel-production by 2030

Funds a number of CCS-related projects e.g.,

COALBYPRO – handling of of CO2 emissions

ROCCS – research on coal seams for CO2 storage

LOWCARBONFUTURE – low carbon future steel industry



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BASRECCS –Regional Baltic CCUS network

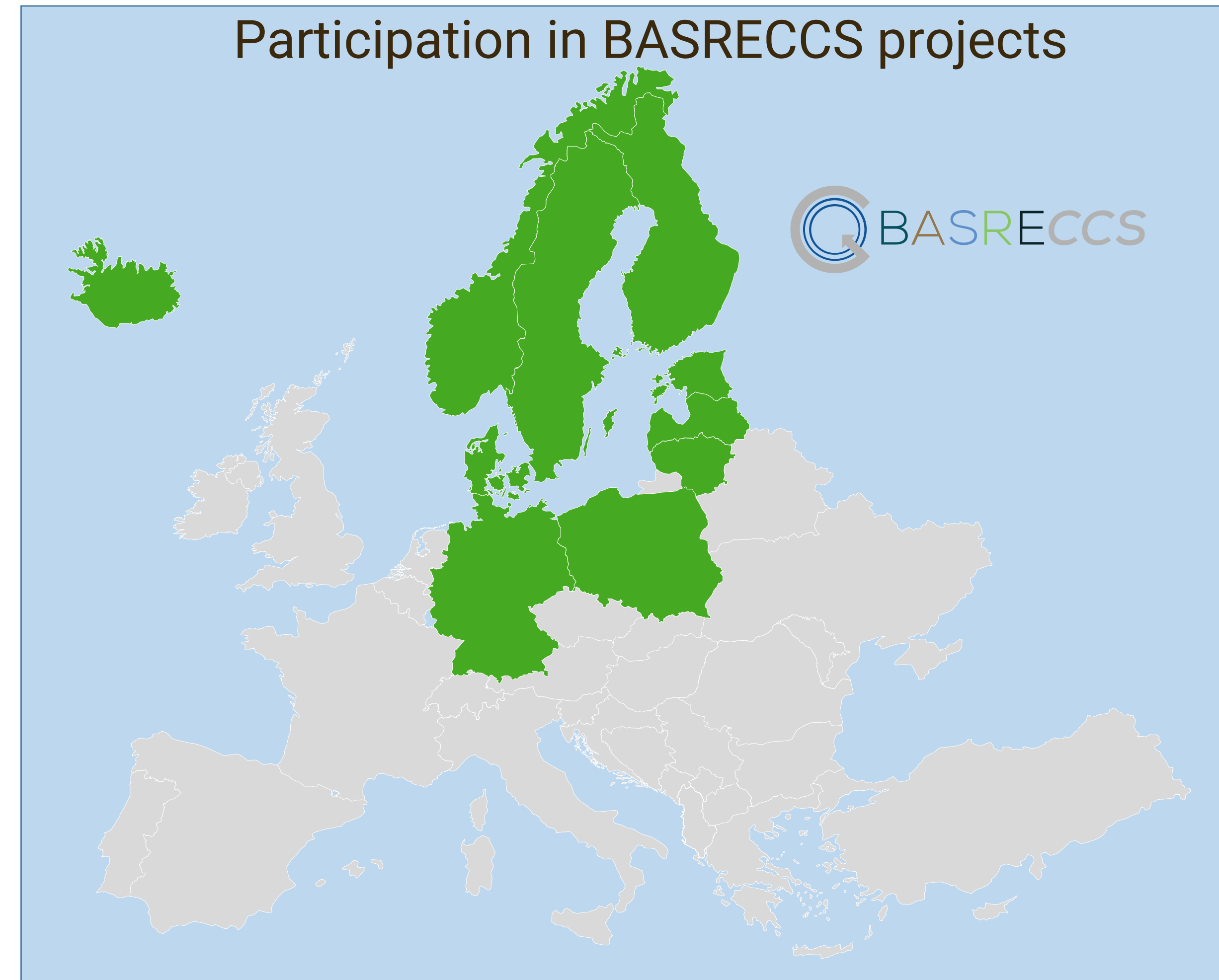
Association of experts and stakeholders

Hosts Annual Baltic Carbon Forum (BCF)

Projects include

RouteCCS (Routing Deployment of Carbon Capture, Use, and Storage in the Baltic Region)

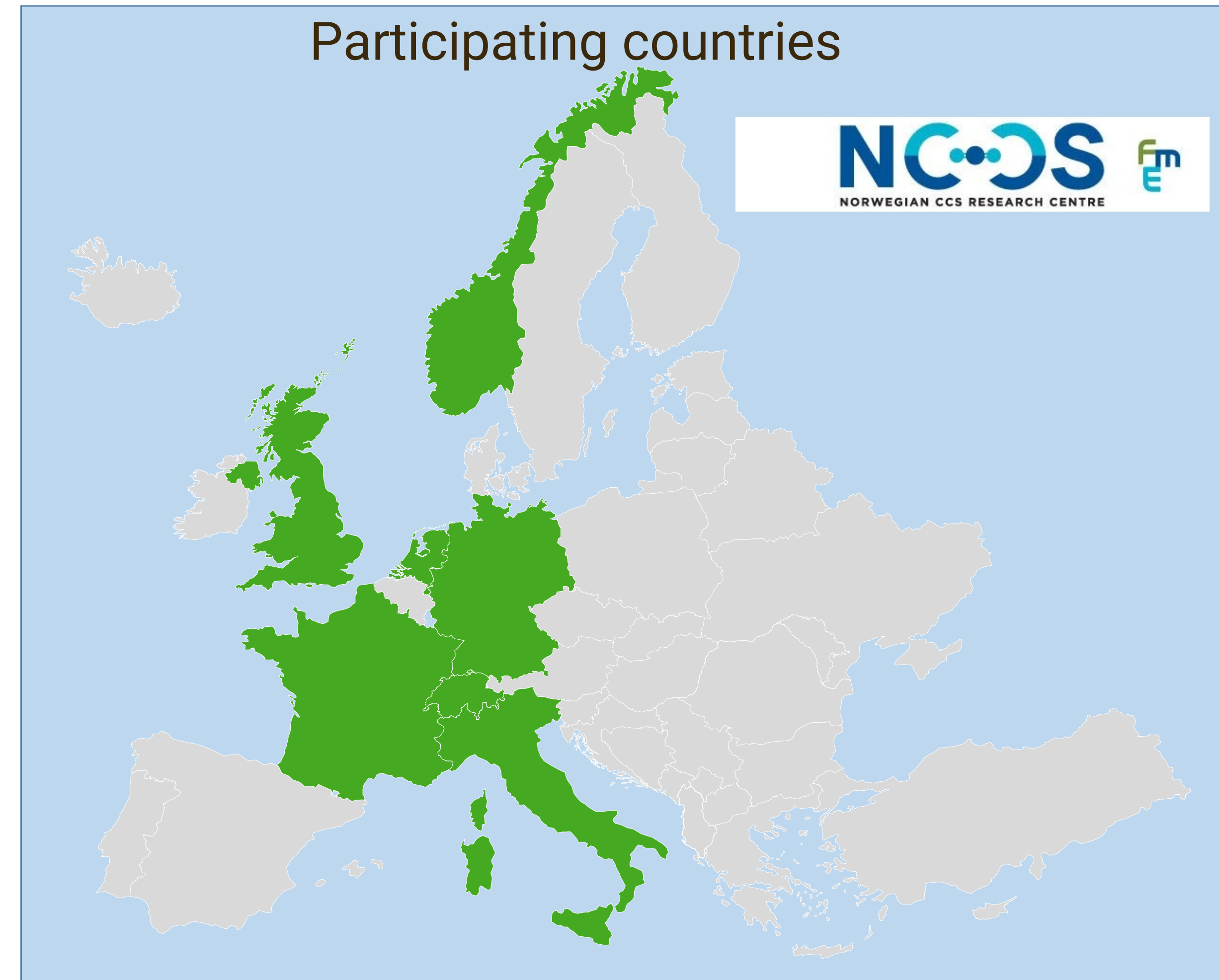
Currently developing a CO₂ geological storage project plan for the Baltic Sea Region.



NCCS - The Norwegian CCS Centre

International research cooperation on CO2 capture, transport and storage

Supports CO2 storage in the North Sea and realization of full-chain CCS project by 2022 (Longship project)



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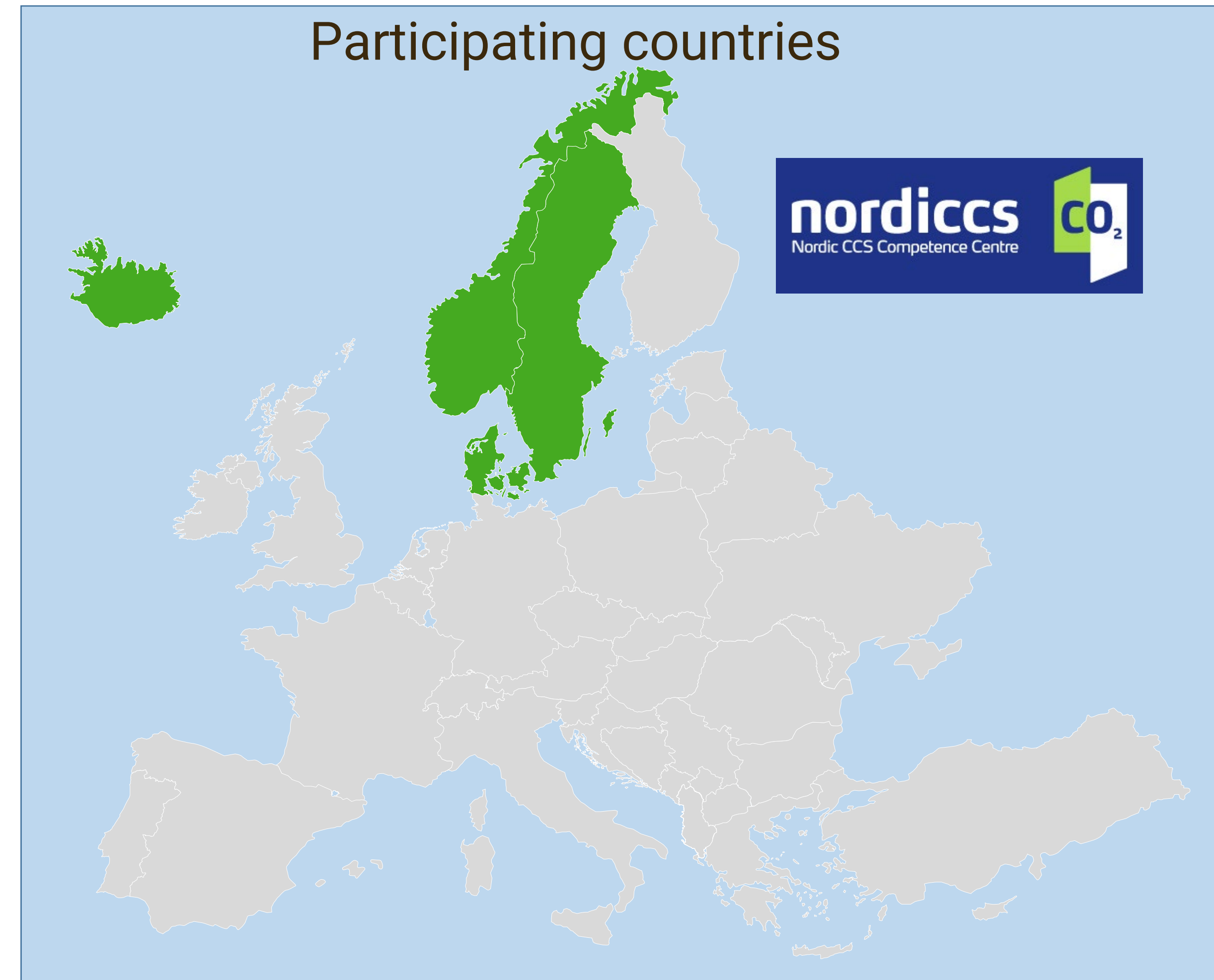


NORDICCS – Project (2011-2015)

Established a virtual CCS networking platform aiming to increase CCS deployment in the Nordic countries through close collaboration between research institutions and industry

Storage atlas

Regional CCS scenario with respect to centralised storage



GeoERA – Establishing the European Geological Surveys Research Area

ERA-NET co-fund action run by the national and regional Geological Survey Organisations of Europe (GSOs)

32 member countries

Funding through H2020 (2018-2022)

Integrate GSO information on subsurface energy, water, and raw materials resources

Organises and co-funds transnational research projects

Although GeoERA does not directly address CO₂ storage, we include it here because of its relevance to geological storage and trans-national cooperation.



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Europe-wide engagement

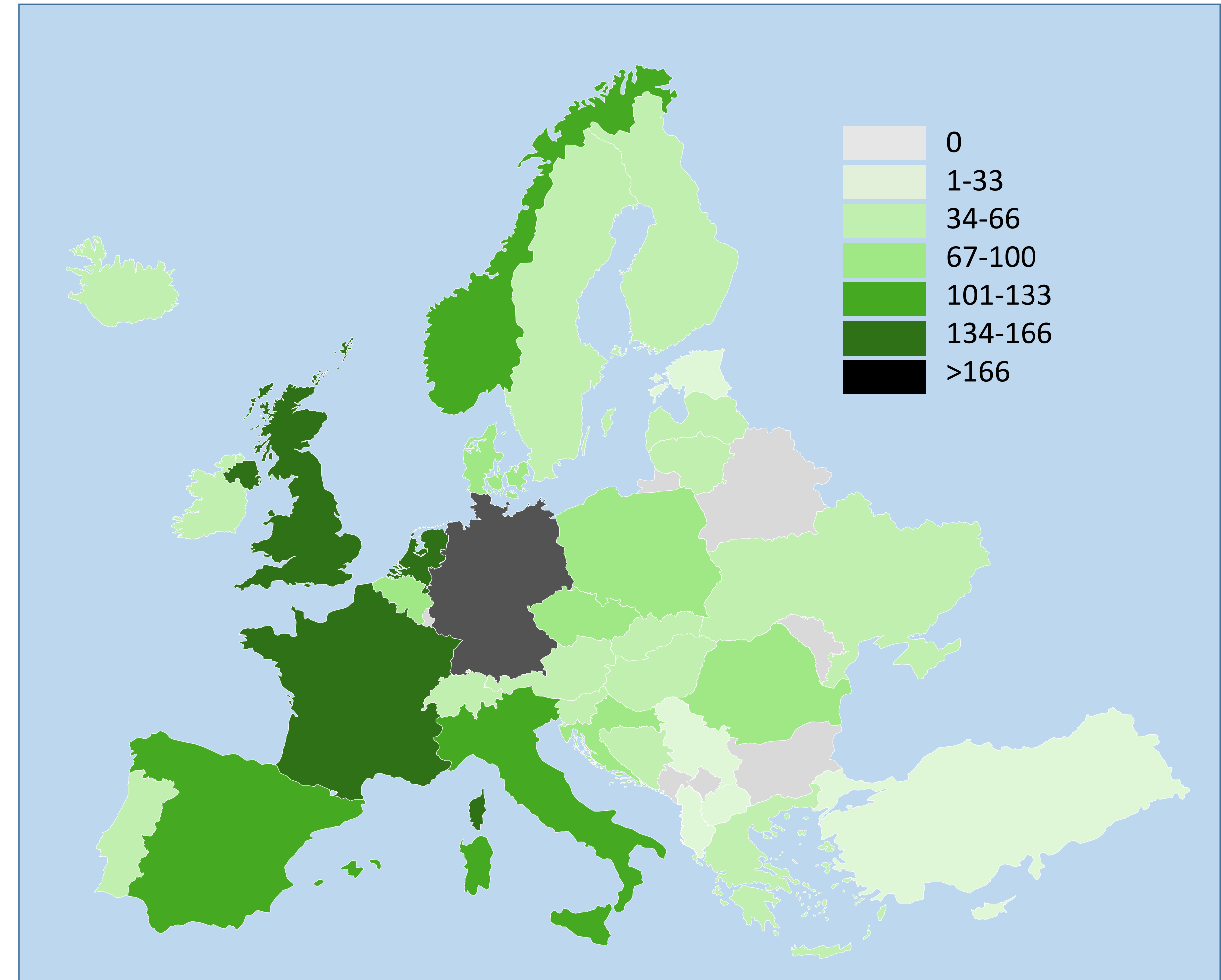


Engagement – Country-country links

A proxy metric for the engagement of individual countries with other European countries in CCS research can be calculated by summing the number of other participating countries in all projects a given country is involved in.

“Country participation” here includes both industry and research institutions

GeoERA plays key role in establishing cross-country links



National CCS-related research



National CCS-related research

Difficult to assess and compare national research efforts in detail

Level of detail provided by the questionnaires about national projects varies substantially in detail

18 countries reported a total of >90 CO₂ storage-related projects since 2020, ranging from development of test sites to PhD projects

Nationally funded projects appears to be focused on

- Storage capacity assessments (reported by 16 of 18 countries)

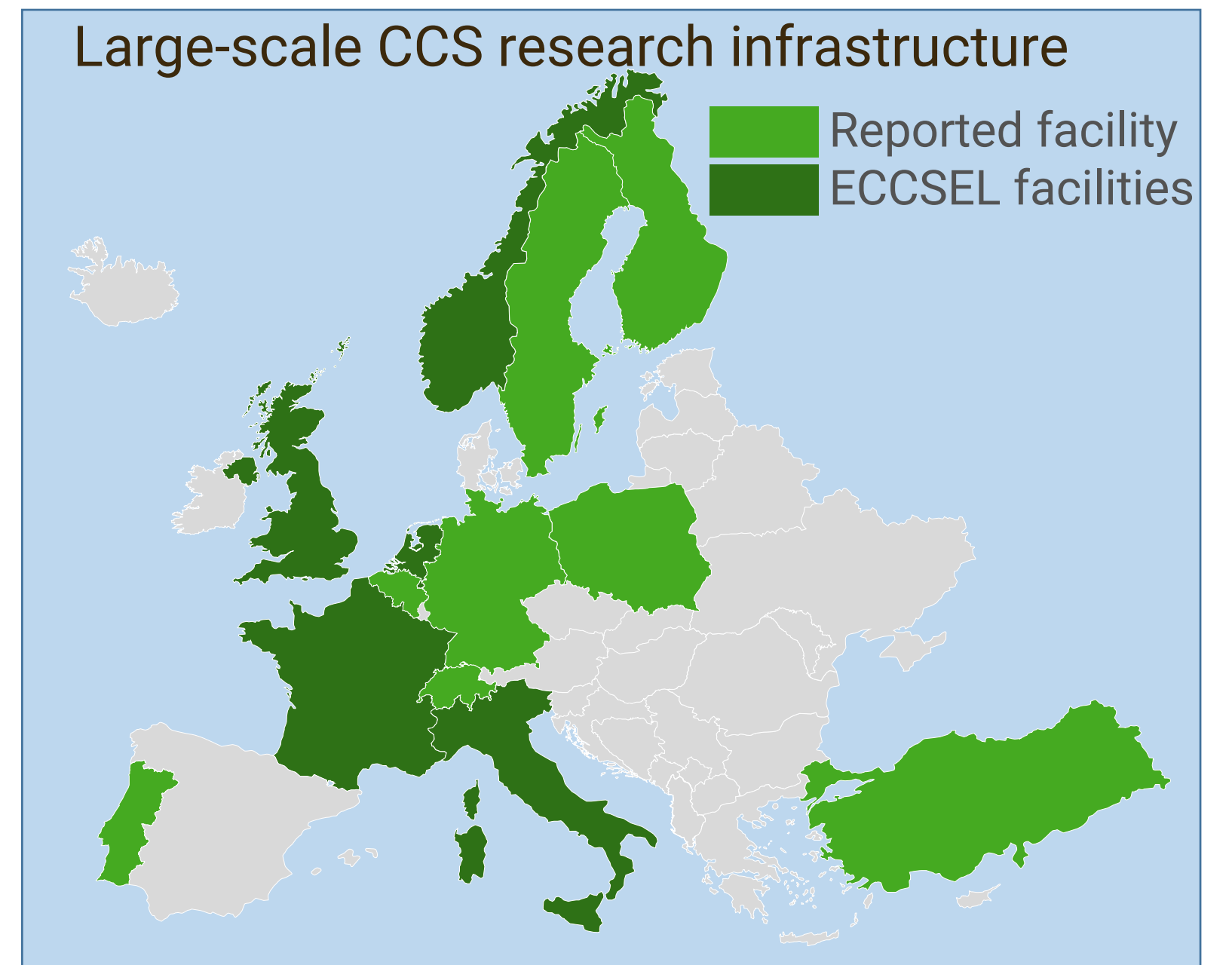
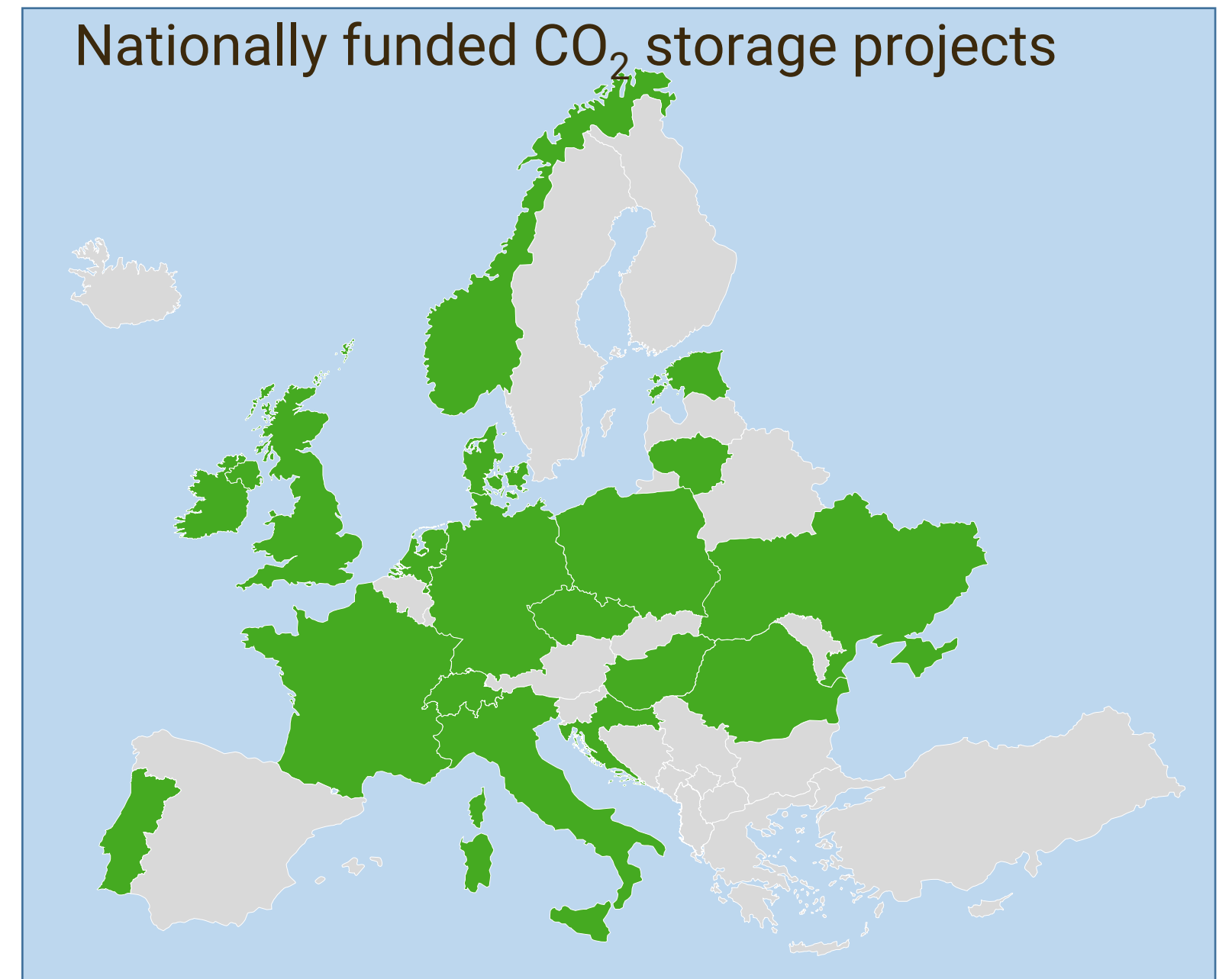
- Modelling of subsurface storage process (14 of 18)

- Well technology (8 of 18)

- Social acceptance (8 of 18)

- Complex management (9 of 18)

13 countries reported they host large-scale CCS research facilities ranging from specialist laboratories to complete test sites. This includes 80 facilities tied to the European Research Infrastructure for CO₂ Capture, Utilisation, Transport, and Storage (ECCSEL)



Global engagement



Global collaboration

Non-European engagement in European CO₂-storage-related research projects

	H2020 projects active as of 30 th June 2021			Regional networks	ACT projects granted 2019						ACT projects granted 2017		
Countries	C4U	CHEERS	ConsenCUS	NCCS	ACTOM	DIGIMON	LAUNCH	MemCCSea	PrISMa	REX-CO2	SENSE	ALIGN CCUS	Pre-ACT
AUSTRALIA													
CANADA													
CHINA													
JAPAN													
U.A.E.													
USA													

Mission Innovation (MI) – Global intergovernmental platform comprising 22 countries and the European Commission for action-oriented cooperation.

Mission innovation 2.0 – Launched in June 2021. catalysing action and investment in research, development and demonstration to make clean energy affordable, attractive and accessible for all, this decade



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Conclusions

- European CCS research is shaped by the sum of national efforts:
 - National legislation (e.g., legal constraints to storage nationally)
 - National/regional storage opportunities
 - Access to funding (EU, regional networks, and availability of dedicated national funds)
 - National research infrastructure
 - Institutional collaborative networks (national and international)
 - Industry involvement (petroleum, emission-intensive industries)
- FP7 and H2020 numbers show a substantial increase in spending on CCS research since 2013
- International outreach





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Thank you for your attention

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