

# French-Norwegian R&D cooperation in CCS

---

Ragnhild Rønneberg, special advisor, coordinator of ACT

[rrr@rcn.no](mailto:rrr@rcn.no)

Paris 23 May 2019



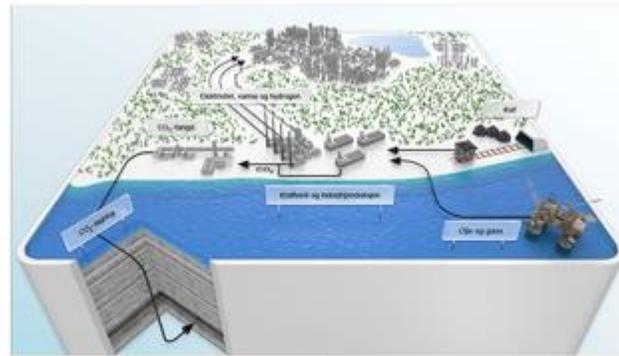


## Norway – in the forefront of CCS

- The Norwegian government accords great importance to Carbon Capture and Storage (CCS).
- The main goal of its CCS policy is to identify measures that can contribute to technology development and cost reductions.



**The Government's carbon capture and storage strategy**

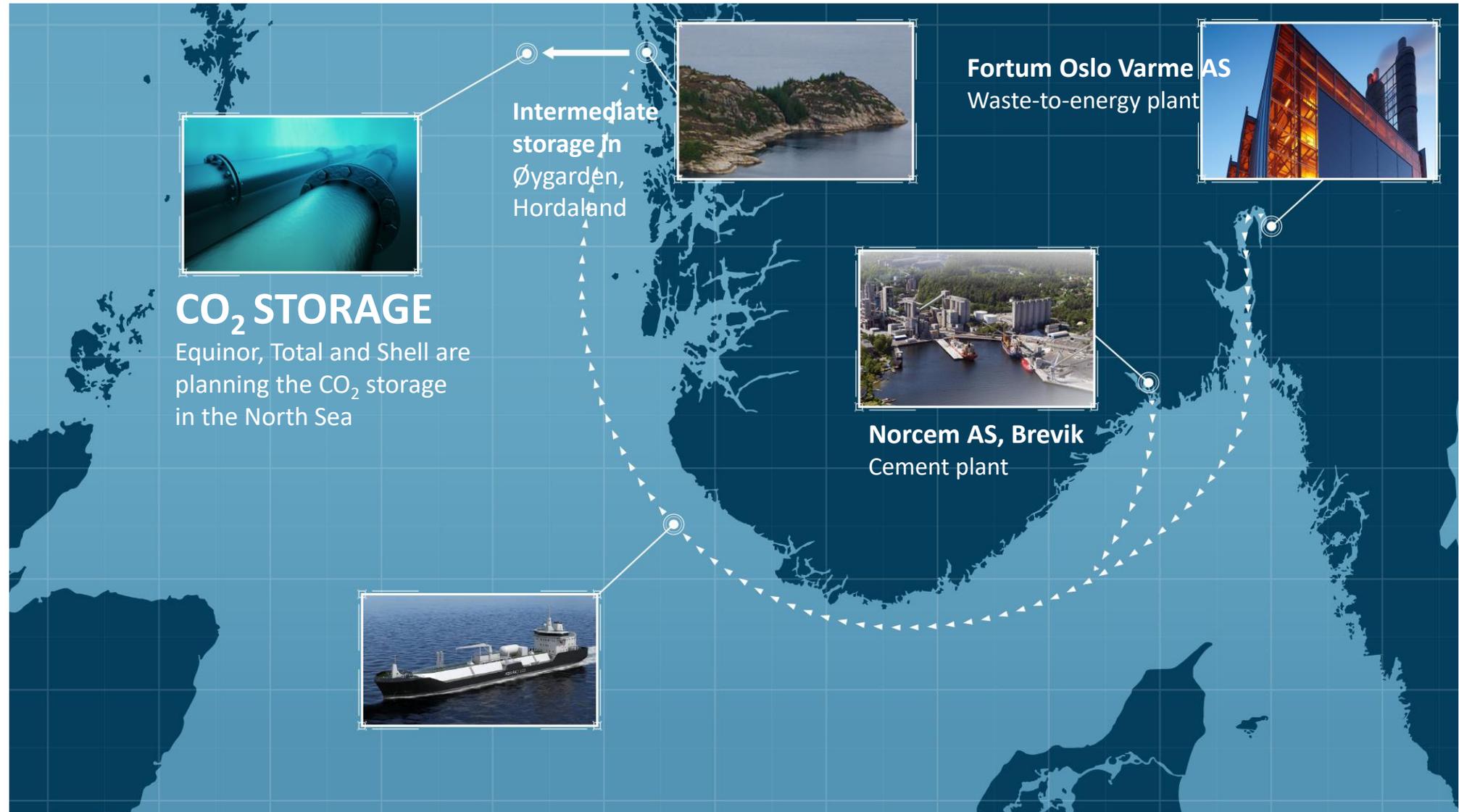


**CLIMIT and Centres for Environment-friendly Energy Research (FME)**



**Technology Centre Mongstad (TCM)**

# ...and ambition for full scale CCS





# Policy instruments for CCS in Norway



Accelerated development of CCS technology



The Research Council  
of Norway



GASSNOVA

Industry

Infra-  
structure

R&D  
Centers

CLIMIT

TCM

Full-scale

Marked



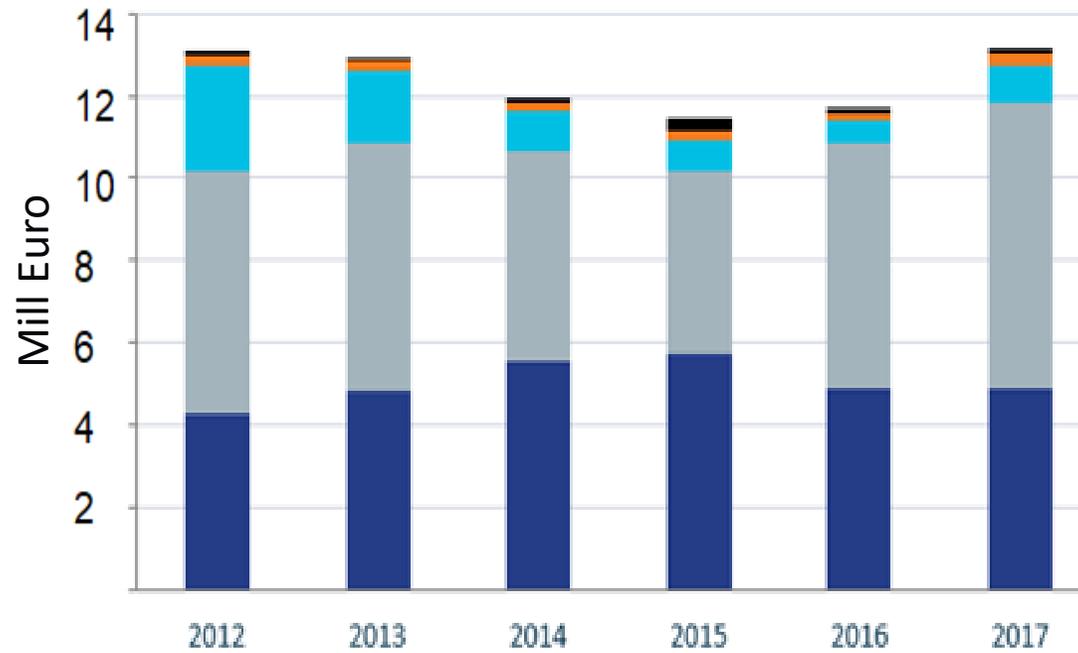
# CLIMIT – the national RD&D programme

- **Objective**
  - RD&D related to CCS technologies.
  - Pave the way for commercialisation of CCS technologies.
- **Budget**
  - 2018 budget: 18M €
    - 50:50 split on R&D (RCN) and pilots and demonstrations (Gassova)
- **Results**
  - Conceptual studies for full scale CCS in Norway would not have been possible without RD&D financed by CLIMIT

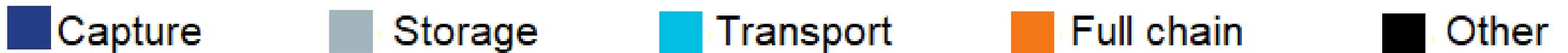
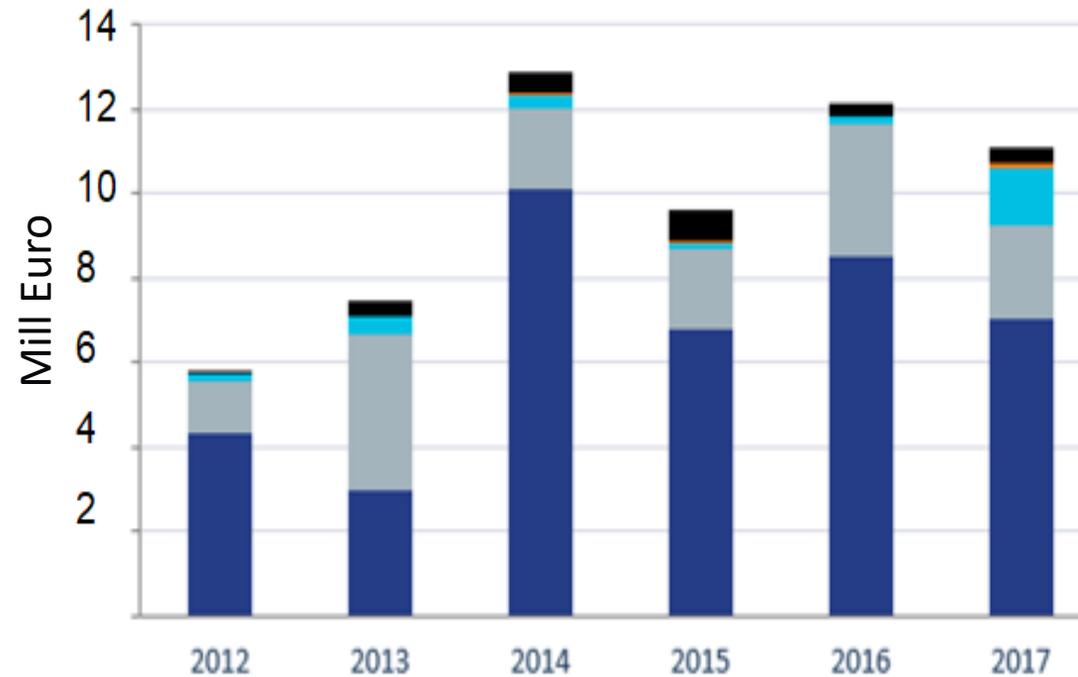


# The CLIMIT program – portfolio and topics

## CLIMIT R&D, administrated by RCN

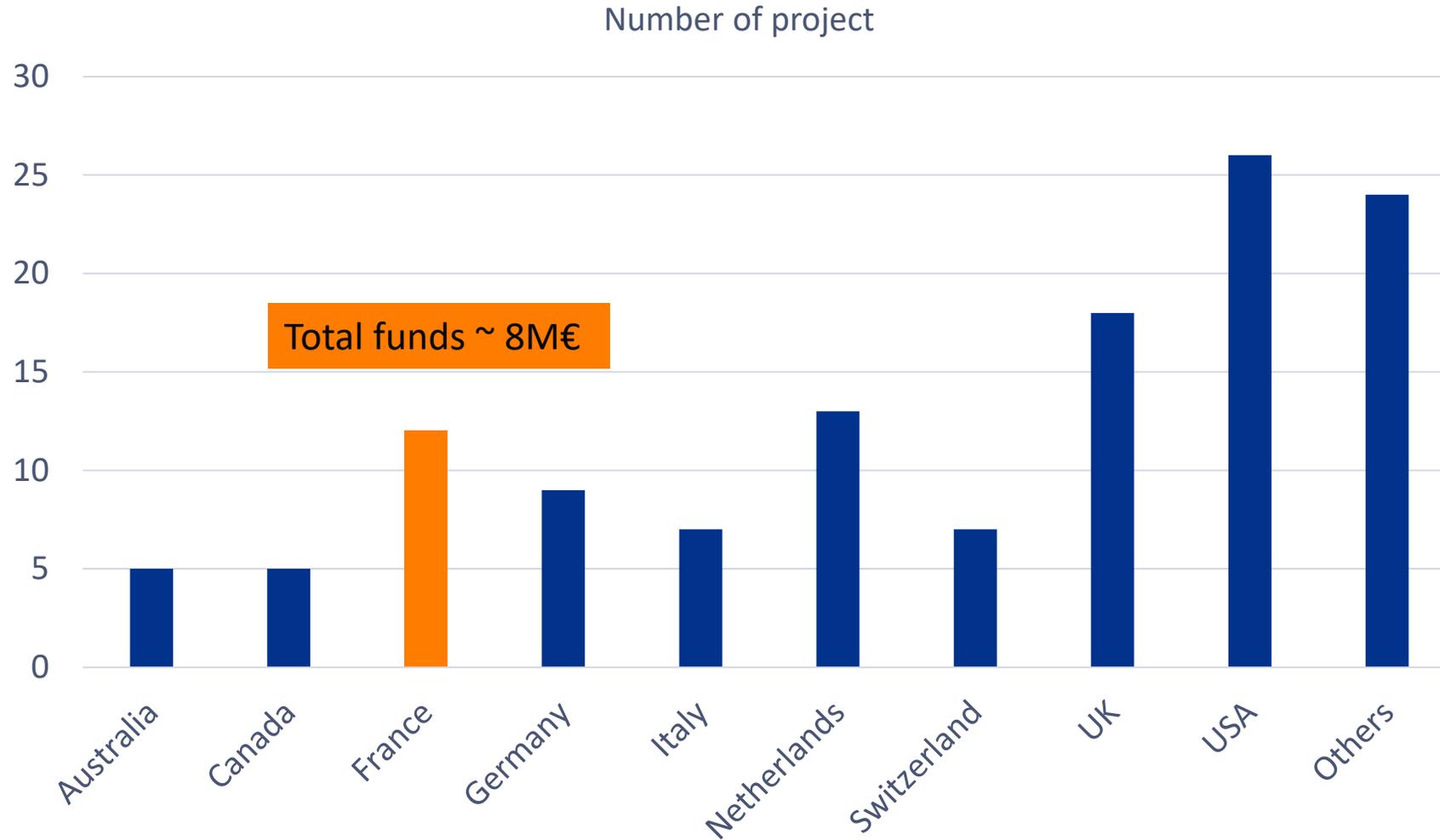


## CLIMIT Demo, administrated by Gassnova





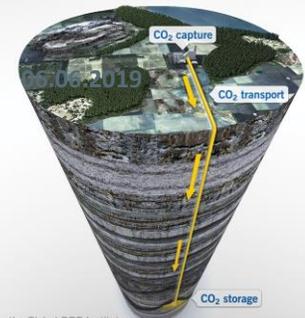
# CCS projects with international partners funded by CLIMIT







# CLIMIT projects with French partners – CO<sub>2</sub> Storage

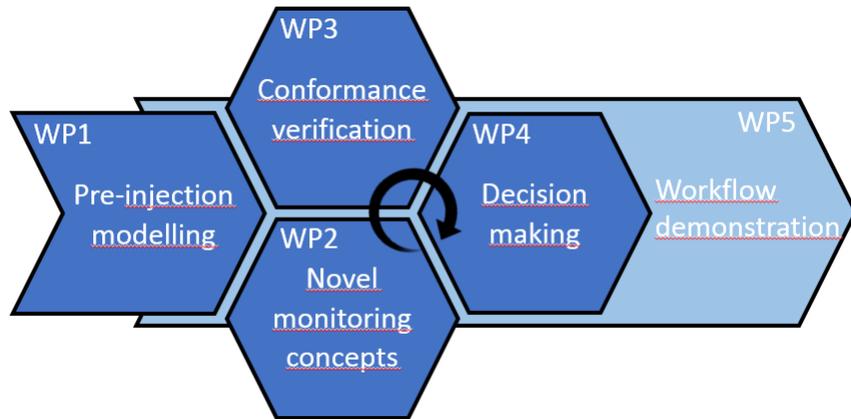


Project	Objective	Project owner	Budget	Period	French partners
SPHIN-CCS	Geomechanical studies to investigate CO <sub>2</sub> flow paths in rocks	SINTEF Industry	€ 1.1 M	2017-2019	CURISTEC
FLUCCS	Studying moving fluid interfaces during cementing of CCS wells	SINTEF Industry	€ 810 000	2017-2019	Etudes et Productions Schlumberger
IGCCS	Induced-seismicity geomechanics for controlled CO <sub>2</sub> storage	Norwegian Geotechnical Institute (NGI)	€ 680 000	2017-2020	Total
OASIS	Seal integrity study for CO <sub>2</sub> sequestration in the North Sea	University of Oslo	€ 870 000	2018-2022	Total
FRISK	Quantification of fault-related leakage risk	Norwegian Geotechnical Institute (NGI)	€ 950 000	2019-2022	Total



# Ongoing ACT projects with French partner

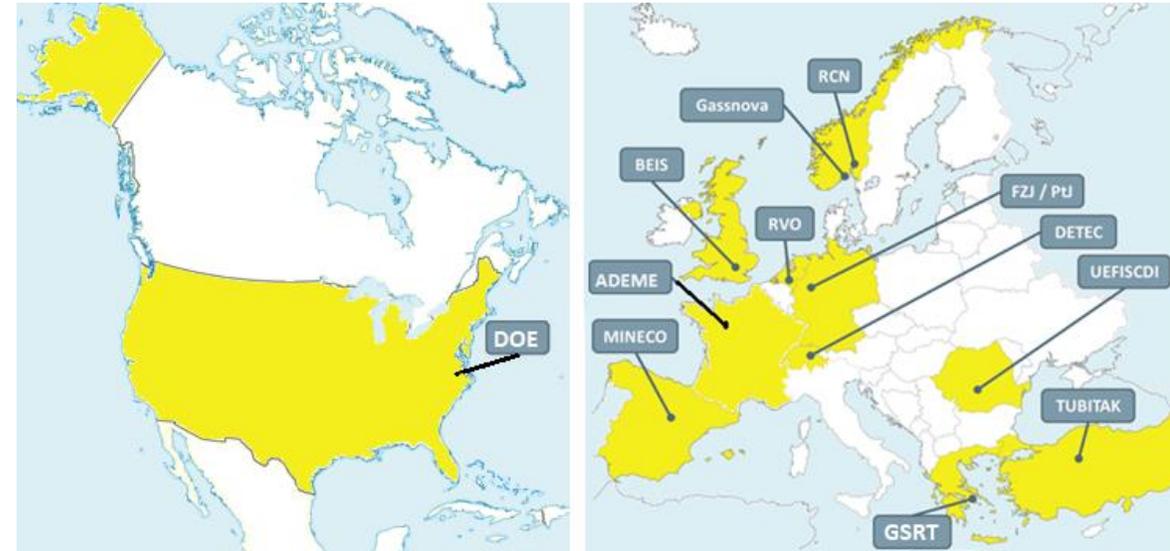
Project	Objective	Project owner	ACT support	Period	French partner
PreACT	Pressure control and conformance management for safe and efficient CO2 storage	SINTEF Industry	€ 4.6 M	2017-2020	Total





# ACT – Accelerating CCS technologies

- 11 countries (13 partners) cooperating on transnational calls and knowledge sharing
  - **ADEME**, GRST and US-DoE, new partners in 2018
- Coordinated by the Research Council of Norway
- 1<sup>st</sup> call in 2016 -> eight first projects funded in 2017 with € 36 M in support from ACT
- Second call launched June 2019, with budget up to € 30 M
- 26 proposals assessed, of which less than half will be funded – decision in June



New call in 2020 is planned



# 1<sup>st</sup> ACT call. Projects funded, 2017-2020

Project	Activities	ACT, M €	Norway	Netherlands	UK	Germany	Romania	Switzerland	Spain	Turkey
ALIGN	Chain integration, clusters	14,5	x	<b>X</b>	x	X	X			
ELEGANCY	Chain integration, hydrogen	8,9	<b>X</b>	x	x	X		x		
PRE-ACT	CO2 storage, pressure handling	4,5	<b>X</b>	x	x	X				
ACORN	Full chain CCS / infrastructure	2,0	x	x	<b>X</b>					
DETECT	CO2 storage, risk assessment	2,0		<b>X</b>	X	X				
ECOBASE	CO2-EOR SouthEast Europe	1,2	<b>X</b>	x			x			x
GASTECH	Gas switching technology	1,7	<b>X</b>	x			x	x	x	x
3D-CAPS	3D printed sorbents	1,5	X	<b>X</b>			x			

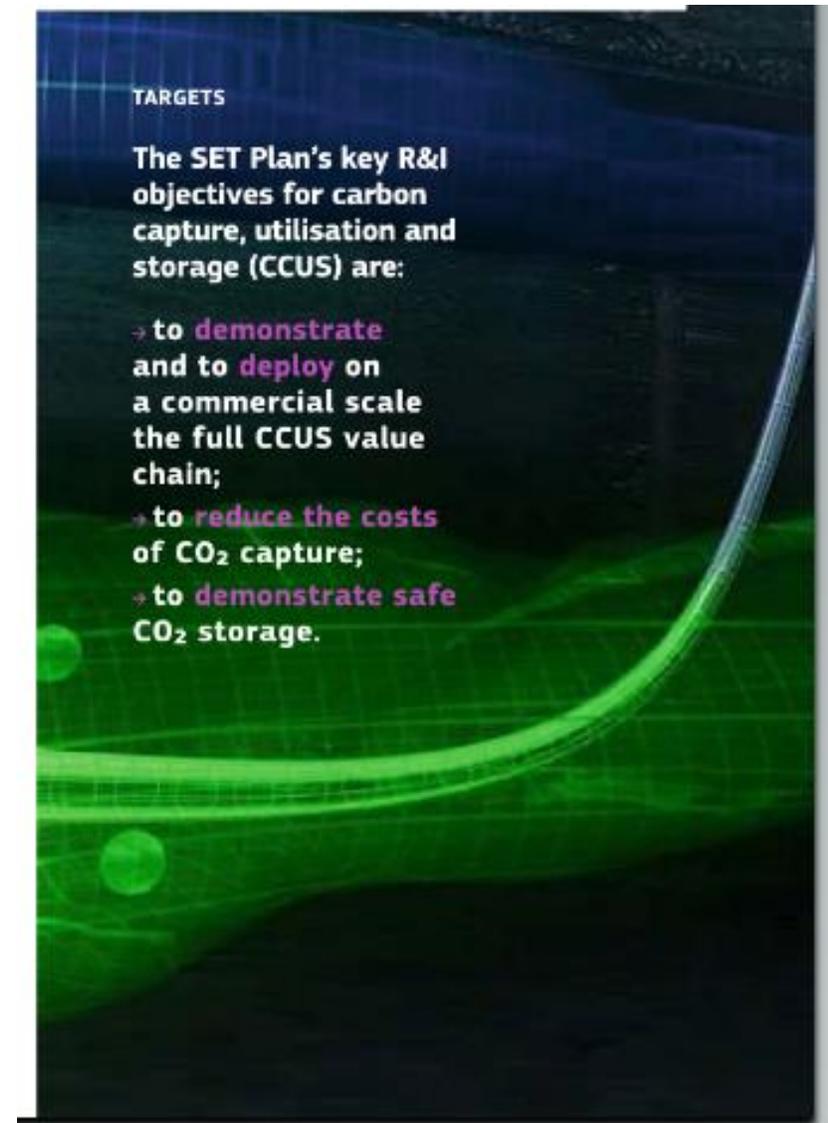
- Total budget for 8 projects: € 50 M
- ACT supporting: € 36 M

**bold X** = lead country  
more info at [www.act-ccs.eu](http://www.act-ccs.eu)

# ACT 2<sup>nd</sup> call (June 2018)

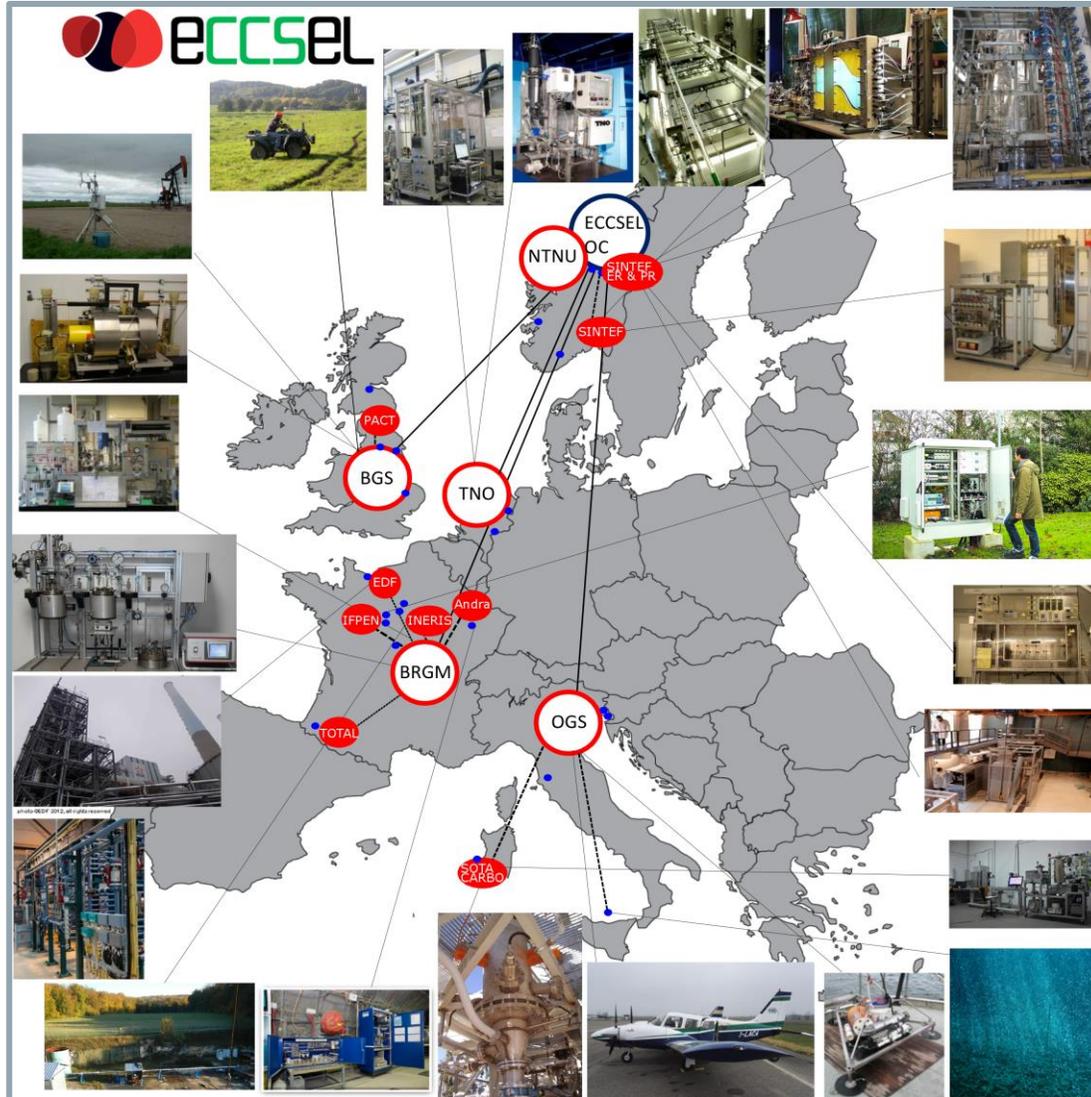
26 full proposals with the following distribution:

- 12 capture
  - 7 storage
  - 2 utilisation
  - 1 transport and storage
  - 1 capture and utilisation
  - 1 storage and mineralisation
  - 1 full chain
  - 1 storage and utilisation
- Total request for funding from ACT is 62M€
  - External evaluation -> ranking list, decision for funding will be taken in June.





# European Carbon Dioxide Capture and Storage Laboratory Infrastructure



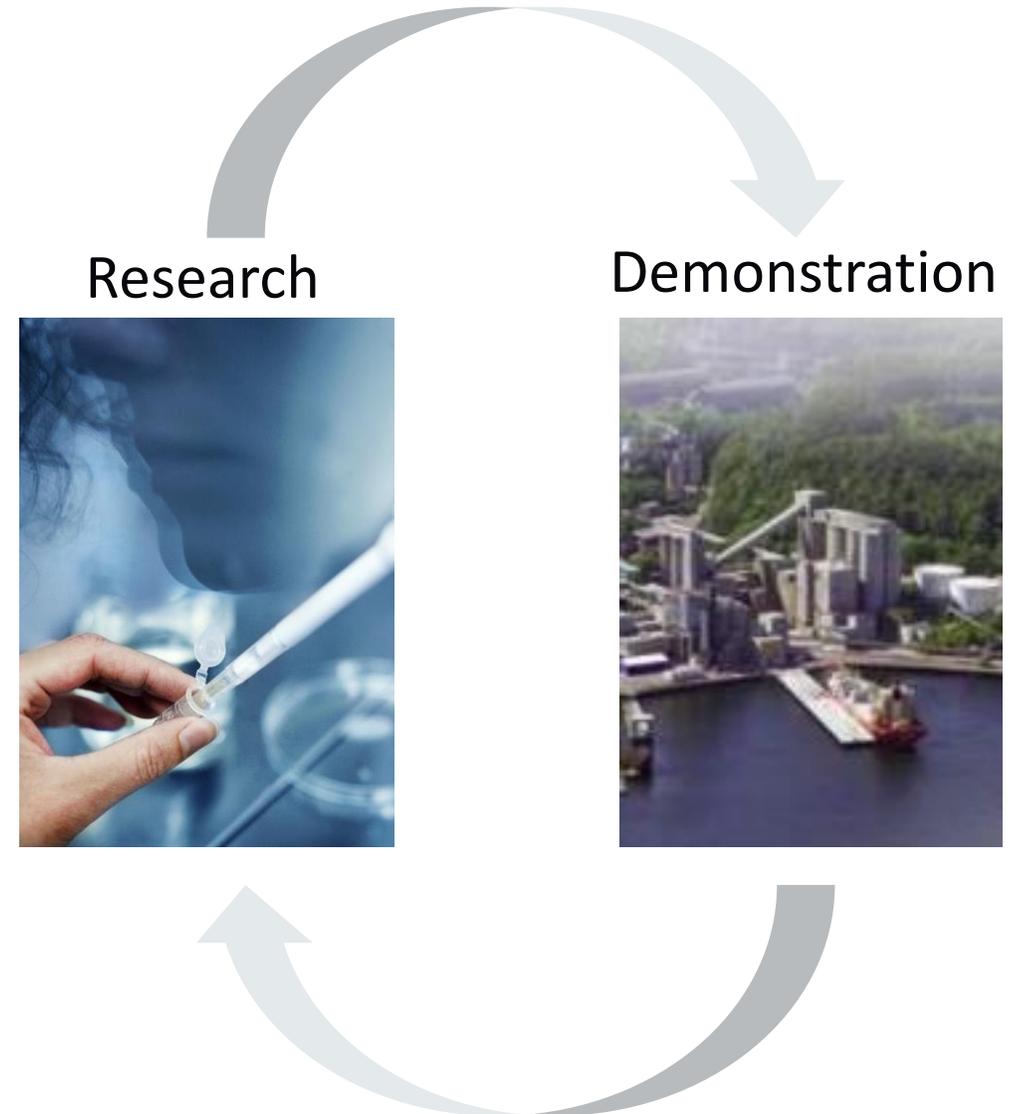
Enabling low to zero CO<sub>2</sub> emissions from industry and power generation

- ***5 countries***
- ***15 owners***
- ***54 research facilities***



## Iterative process

- Building full scale CCS will generate new challenges
- Research and demonstration in an iterative process is needed to ensure cost reduction





## Conclusion – possibilities for further collaboration



- Bilaterally
- ACT
- ECCSEL
- CSLF
- ...more....

....in all topics of the CCUS field, but also work towards the EC and the public so that CCUS is regarded and accepted as:

- Necessary and essential tool for the green shift
- ...for combating climate change
- Safe
- Effective
- and good for creating jobs and sustainability



**Thank you for your attention**

[www.climit.no](http://www.climit.no)

[www.act-ccs.eu](http://www.act-ccs.eu)



Ragnhild Rønneberg [rr@rcn.no](mailto:rr@rcn.no)