Overview of the ACT Initiative
November 5, 2019

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US DOE ACT Representative
Why ACT?

• Carbon Capture, Utilization and Storage (CCUS) is an essential part of the toolbox for reducing CO₂ emissions.

• International cooperation and knowledge-sharing are crucial factors for widespread deployment.

• Leverage skills, capabilities, etc.
ACT – How it works

• ACT is a fit-for-purpose, partner-driven, **flexible** and an easy-to-join multi-national mechanism that is focused on accelerating CCUS technology.
• Research Council of Norway (RCN) is overall coordinator for the effort
• National funding stays within country to fund researchers (e.g., U.S. funds U.S. researchers, etc.)
• Follows national procedures for funding
• Can tailor to your countries interests (e.g., capture, or even more specific technologies)
• Does require coordination amongst members for overall call for proposals and evaluations; and agreements between project partners.
• Selected projects monitored for progress
• Third call under consideration: *New partners are welcome!*
## CSLF Members Participating in ACT1 and ACT2

<table>
<thead>
<tr>
<th>ACT</th>
<th>Australia</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>Czechia</th>
<th>European Commission</th>
<th>France</th>
<th>Germany</th>
<th>Greece</th>
<th>India</th>
<th>Italy</th>
<th>Japan</th>
<th>Korea</th>
<th>Mexico</th>
<th>Netherlands</th>
<th>New Zealand</th>
<th>Norway</th>
<th>Poland</th>
<th>Romania</th>
<th>Russia</th>
<th>Saudi Arabia</th>
<th>Serbia</th>
<th>South Africa</th>
<th>United Arab Emirates</th>
<th>United Kingdom</th>
<th>United States</th>
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<tr>
<td>ACT</td>
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</table>

- Non-CSLF Members participating in ACT: Spain, Switzerland, Turkey; Nordic Energy Research
- Momentum and interest is growing
Status for the two ACT calls

1\textsuperscript{st} Call for proposals, June 2016

- 10 partners from 9 countries cooperate
- 8 new projects decided for funding in 2017
- Project period 3 years
- 36 M€ from ACT
  - of which ~11.9 M€ from the EC

2\textsuperscript{nd} Call for proposals, June 2018

- 13 partners from 11 countries cooperate
- 12 new projects decided for funding in June 2019
- Project period up to 3 years
- 31 M€ from ACT
  - No EC money
  - Kick off in Sept/Oct. 2019
### 1st call. Projects funded, 2017-2020

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

- 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 call 2 in 2018, partners

- **France**, Germany, **Greece**, The Netherlands, Norway, Romania, Switzerland, Spain, Turkey, UK and **USA**
  (green = new in ACT2)

- Total budget: up to 30 M€ (varies from 0,4 - 6M€)
- Projects encouraged to target issues defined by:
  - SET-Plan CCS and CCU Implementation Plan
  - Mission Innovation Research Priorities
  - ...and make use of world class infrastructure, e.g ECCSEL
### 2nd call. Projects funded, 2019-2022

<table>
<thead>
<tr>
<th>Project</th>
<th>Activities</th>
<th>ACT, M €</th>
<th>France</th>
<th>Germany</th>
<th>Greece</th>
<th>Netherlands</th>
<th>Norway</th>
<th>Romania</th>
<th>Spain</th>
<th>Switzerland</th>
<th>Turkey</th>
<th>UK</th>
<th>USA</th>
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<tbody>
<tr>
<td>DigiMon</td>
<td>Digital Monitoring of storage sites</td>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>LAUNCH</td>
<td>Predict and control degradation</td>
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<td>X</td>
<td>X</td>
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<tr>
<td>AC2OCEM</td>
<td>Oxyfuel technology for cement industry</td>
<td>3</td>
<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>ACTOM</td>
<td>Monitoring of offshore storage</td>
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<td>ANICA</td>
<td>Carbonate looping process</td>
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<td>FUNMIN</td>
<td>Mineral carbonization</td>
<td>0.7</td>
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<td>MemCCSea</td>
<td>Compact membrane offshore</td>
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<td>NEVEST-CCS</td>
<td>Technology for CCS in WtE plants</td>
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<td>PrISMa</td>
<td>Sorbent materials for capture</td>
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<td>REX-CO2</td>
<td>Reuse of existing wells for storage</td>
<td>2.5</td>
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<td>SENSE</td>
<td>Integrity through ground surface monitoring</td>
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<td>SUCCEED</td>
<td>CO2 storage and geothermal</td>
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</table>

- Total budget for 12 projects: € 43.5 M
- ACT supporting: € 31 M

**bold X** = lead country

more info at [www.act-ccs.eu](http://www.act-ccs.eu)
Distribution of ACT2-projects

- Projects have included communication, knowledge sharing and social aspects
- Germany, The Netherlands, Norway, UK and USA participate in 7-10 of the projects
- France, Greece, Spain, Switzerland and Turkey participate in 1-4 projects
- Participants from 3-7 countries in each project

Number of projects in ACT2

Funding to ACT2 projects, Euros

Co-funded by the European Commission within the Horizon 2020

www.act-ccs.eu
Additional activities and Knowledge Sharing

- ACT is more than just the single projects
- The projects can learn from each other
- Knowledge Sharing Workshop in Romania 24 October 2017 for funded projects
- Knowledge Sharing Workshop at RWE, Germany, 13 November 2018
- ...in Greece in 6-7 November 2019
- The projects should together with the ACT consortium and other initiatives lead to accelerated CCUS deployment globally

www.act-ccs.eu
Summary

• **Lessons Learnt**
  • Cooperation within the ACT consortium is very good
  • NO, UK an NL very much in line with same goals for a full chain CCS implementation, industry interest and relevant
  • Smaller CCS countries benefit much from the cooperation
  • Hard to attract industry in some countries
  • Extended consortium (included US and France) in 2018 and NER in ACT3

• **Added value and Impact**
  • Cooperation between the funded project (from ACT1) is very good
  • Learnings across borders and across projects, very beneficial to all partners
  • The majority of projects (from ACT1 and ACT2) are at TRL 2-5, higher TRL projects are more challenging...