



# ITCN INTERNATIONAL TEST CENTER NETWORK

Accelerating the research and development  
of CCUS technologies

# Mission

**Share CO<sub>2</sub> Capture Knowledge**  
to encourage global collaboration and accelerate  
technology development of cost effective CO<sub>2</sub>  
capture processes



# International Test Center Network

- Share public knowledge with carbon capture test facilities.
  - Facility operations
  - Facility funding
  - Safety
  - Analytical techniques
- Bilateral collaboration – deep-dive knowledge sharing, funding proposal cooperation, support of international initiatives
- Collaborate on one technical item per year.
  - Amine carry-over and measurement techniques
  - Support advanced simulations and model development with a focus on reducing capital and operating cost and minimizing scale-up risks
  - Open access solvents



# ITCN Members



# ITCN-2018

- Expansion of international membership
- Partnership and collaboration
- New website with membership data archive ([www.itcn-global.org](http://www.itcn-global.org)).
- Facilities expansion including, sCO<sub>2</sub> reactor, BECCS + WtE, next generation capture technology and CCUS as a part of integrated smart energy system (TRL 3-6)

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# ITCN Members



## Europe

**Germany**  
E.ON's Wilhelmshaven power plant

**Norway**  
CO2 Technology Centre Mongstad (TCM)  
SINTEF's Tiller facility

**United Kingdom**  
Pilot-Scale Advanced Capture Technology facilities (PACT)

## North America

**Canada**  
SaskPower's Shand Power Station

**USA**  
National Carbon Capture Center (NCCC)  
University of Kentucky Center for Applied Energy Research  
University of North Dakota Energy & Environment Research Center

## Asia

**China**  
Huaneng's Clean Energy Research Institute

**Japan**  
Research Institute of Innovative Technology for the Earth

**South Korea**  
KEIR's Hadong and Boryeong test centers

## Australasia

**Australia**  
CO2CRC's Otway Research Project  
CSIRO's Loy Yang and Tarong test centers  
CSIRO's Vales Point pilot plant

# ITCN-2018

## Additional Member Benefits

Online access to ITCN Handbook

Online access to ITCN Facilities database

Online access to the ITCN community via the Members' Exchange facility

## Additional New Pilot Scale Facilities (TRL 3-6)

sCO<sub>2</sub> power cycle reactor + heat exchanger

Waste to energy with CCUS

CCUS facilities Including CCUS-H<sub>2</sub> decarbonization

BECCS (Pre, Post & Oxy)

Next generation capture technology (e.g. PRB)

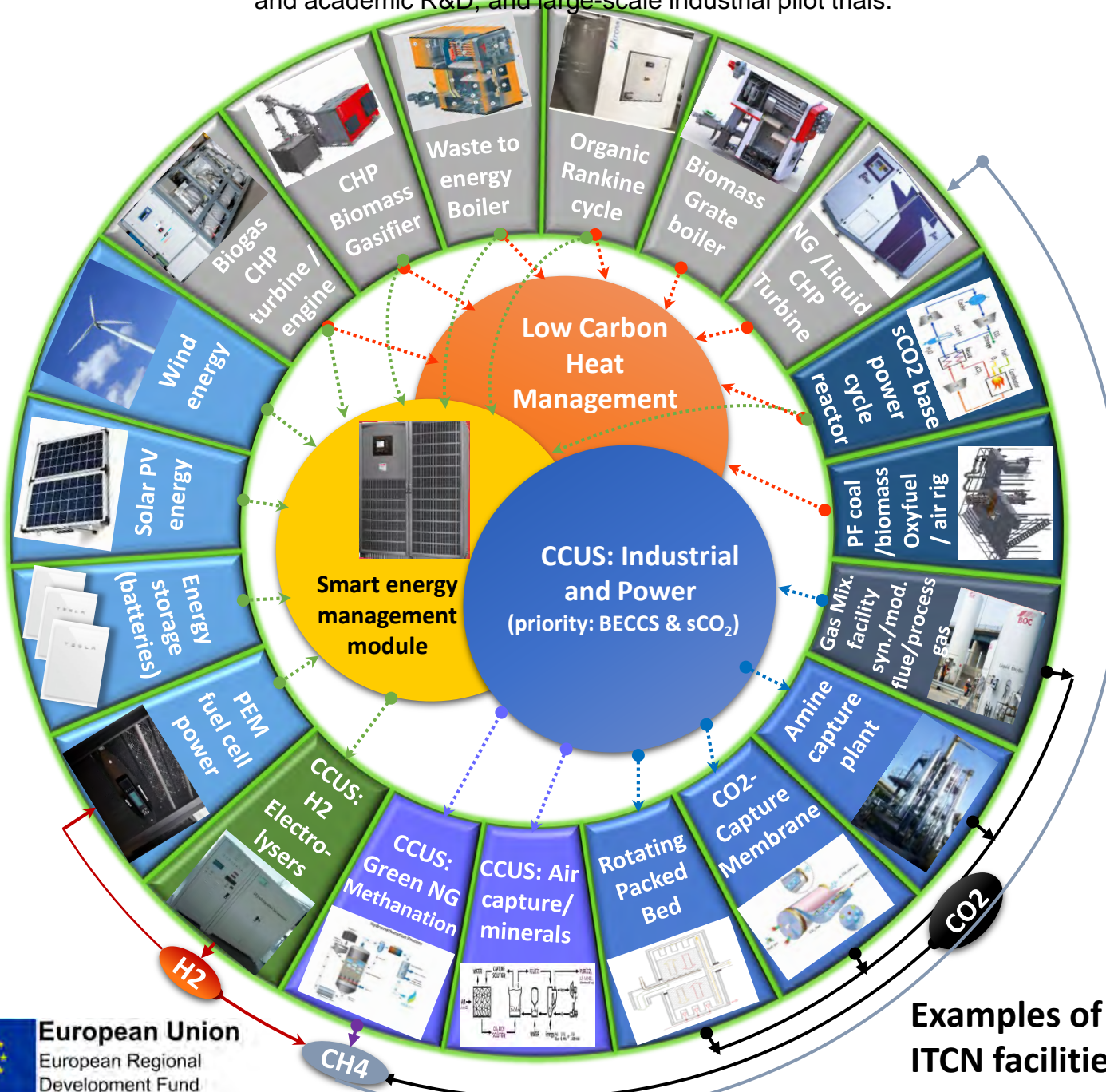
CCS as a part of integrated power system

## ITCN – CSLF Collaboration

Contribution to Possible Future Technical Group Actions (new topics for appraisal)

Offer of support from ITCN members to CSLF

Bringing together a comprehensive range of integrated facilities bridging the gap between bench-scale industrial and academic R&D, and large-scale industrial pilot trials.



**Online-Analytical**

- Emissions & process gas analysis
- ICP metal emissions
- Solvent analysis
- Particle emissions

**Lab-Analytical**

- Auto titrator
- GC-MS
- TG-IR
- CHNS Analyser
- Petroxy
- ICP-MS
- Micro GC
- Characterization & prototyping facilities
- Laser Diagnostics for temperature, species and flow\*
- Oxidative & thermal degradation equipment\*

**Examples of new ITCN facilities**



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# Supplemental Slides

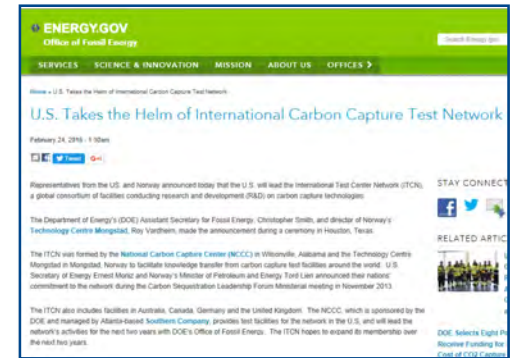
# CC ITCN Objectives

- Share lessons learned and results from parallel activities
- Provide enhanced technical learning and confidence
- Increase insight and awareness of different technologies that may reduce risks and increase investments in CO2 capture technology
- Enhance public awareness and acceptance of the technology
- Work with technology developers to scale up tests and operate under different conditions



# Key Accomplishments

- Established Network Charter and Demonstrated relationship and contractual model
- Drafted Technical Report
- Served as a model for creation of CSLF's Large-Scale Saline Storage Project Network
- Successful transition to Leadership by the United States
- Increased public awareness of capture R&D
- Supported progressive scale up of capture technology to larger demonstrations
- Technical Sharing Lessons Learned
  - measuring emissions and amine degradation products from post-combustion capture
  - aerosols and mist formation and mitigation and how to measure mist particle size and distributions



The image shows the cover page of a technical report. The title is "Lessons learned from measuring amine-related emissions to air from post-combustion CO<sub>2</sub> capture: Experiences of members of the CCS Test Centre Network". The report includes a table of contents with the following sections and page numbers:

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# Possible Future Technical Collaboration

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- Evaluation of Flue Gas from natural gas sources and the benefits of reducing oxygen concentration.
- Consider alternative base runs to MEA solvent such as a mixture of solvents or other public domain solvents.
- How to support model development and advanced simulations with a focus on reducing capital cost and opex?
- Data and equipment configuration required for input
  - Is it possible to participate with US DOE CCSI?
  - How data is collected and used in simulations? Accuracy of data?
  - What are the parametric tests that inform simulation?
- Addition of on-line monitoring of liquid absorbents.