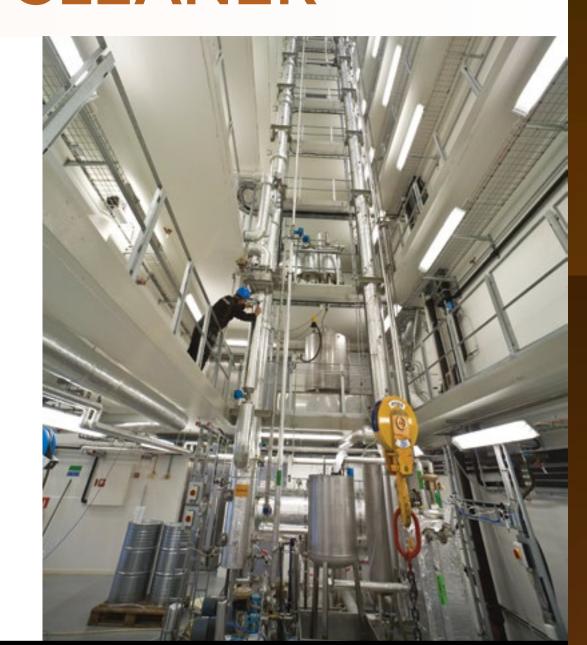
# CAPTURING CO<sub>2</sub> USING LESS ENERGY AT SCALE

Validating a water-lean solvent process that can reduce energy use and decrease the cost required for carbon capture compared to current technologies

# MAKING COAL-FIRED POWER PLANTS CLEANER

RTI's water-lean solvent-based CO<sub>2</sub> capture process using coal-fired flue gas moves closer to commercialization through testing completed at the National Carbon Capture Center and SINTEF's Tiller plant by:

- Increasing solvent performance
- Designing and building unique non-aqueous solvent (NAS) process modifications for the Tiller plant
- Performing long-term testing of non-aqueous solvent at larger scale on coal-derived flue gas



COMPLETED ON

1,200 hours of NAS testing

at the SINTEF Tiller plant

duty of about 2.6 MJ/kg CO<sub>2</sub>

COAL-FIRED FLUE GAS

Captured 90% of the CO<sub>2</sub> contained

in the flue gas at a specific reboiler

**FUTURE DEVELOPMENT** 

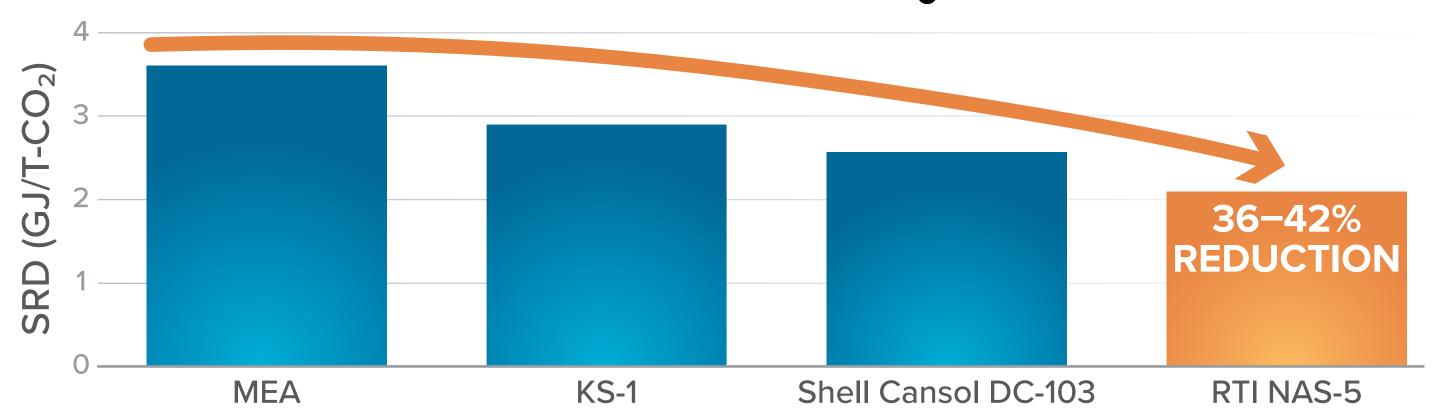
2018–2021

TRLs **7–8** 

# MODIFICATIONS IMPROVE CO<sub>2</sub> CAPTURE PERFORMANCE

Interstage coolers, a new regenerator packing section, and a rich solvent preheater have improved the NAS-based CO<sub>2</sub> capture process.

#### SPECIFIC REBOILER DUTY COMPARISON

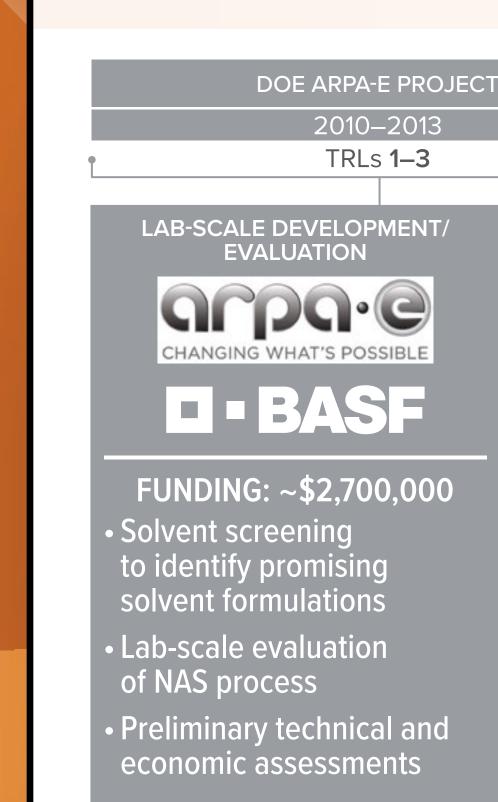


DOE NETL PROJECT

2014-2016

TRL 4

# PATH TO COMMERCIALIZATION



LARGE BENCH-SCALE SYSTEM/
RELEVANT ENVIRONMENT TESTING



FUNDING: ~\$3,000,000
• Finalize NAS formulation

- Finalize NAS formulation
   Develop critical process components
- Demonstrate ≤2.0 GJ/T-CO<sub>2</sub> using bench-scale system
- Detailed solvent degradation studies and techno-economic analysis
- Demonstrate T&EA competitiveness and environmental permitability

#### COMBINED SINTEF (TILLER)

DOE NETL PROJECT (CURRENT)

2015–2018

TRLs **5–6** 





- FUNDING: ~\$2,700,000
- Tiller Plant (~60 kWe)
  Demonstrate all NAS
- process components

  Oughtify solvent lesse
- Quantify solvent losses and emissions
- Test using coal-derived flue gas
- compatibilityCollect critical process

data to support scale-up

- Determine materials

#### TCM PATHWAY LARGE PILOT EVALUATION

2021+

TRL 9



#### • TCM (~10 MWe)

- Complete process unit with components at minimum size for confident scale-up
- Collect critical process information to support detailed techno-economic assessment, emissions monitoring, and long-term testing to develop reliability, availability and maintainability metrics

### QUICK FACTS

AWARD NUMBER
DE-FE0026466

# PROJECT BUDGET

FY18 FUNDING



• FEDERAL \*\*\*\*\* \$3,468,584

● RTI INTERNATIONAL···\$1,064,068

## CONTACTS

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Reducing the cost of captured carbon and putting it to work for America



