

Carbon Capture in the Refining Industry

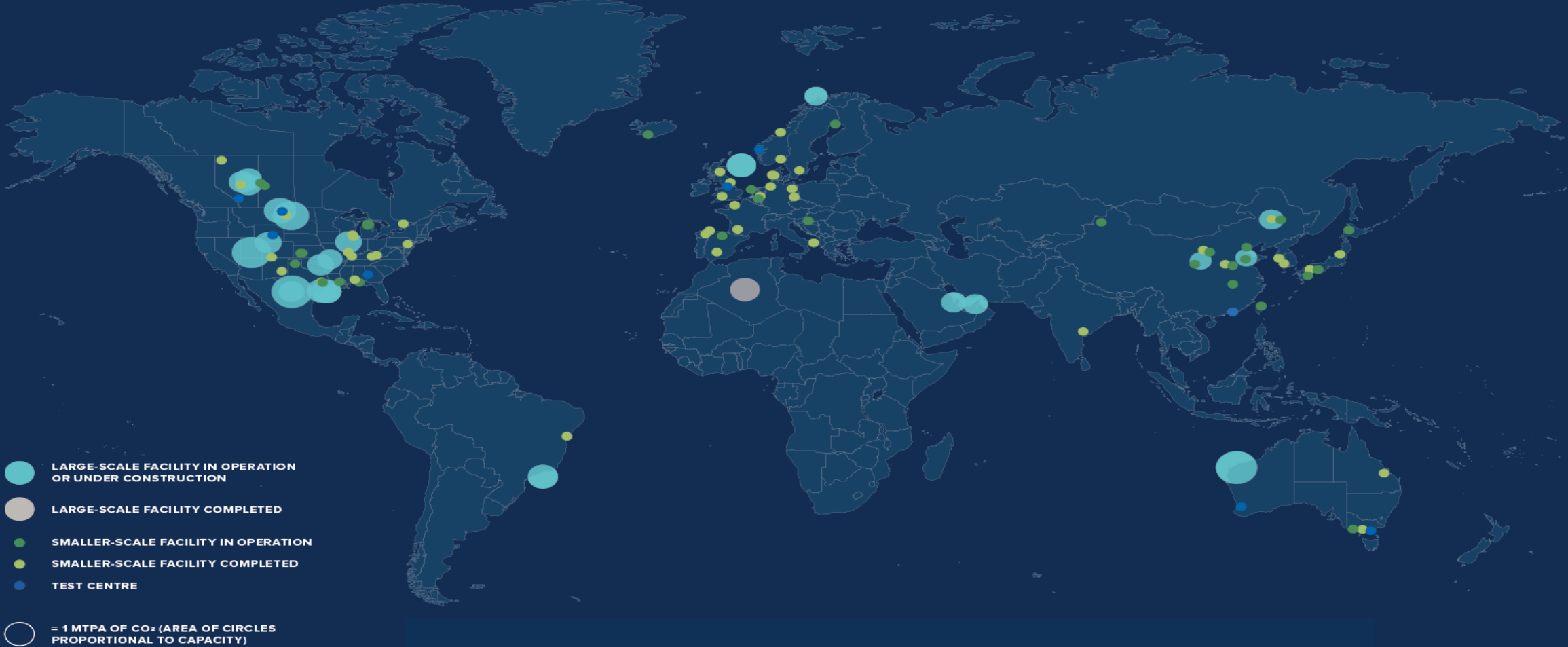
Robert Mitchell

Senior Client Engagement lead



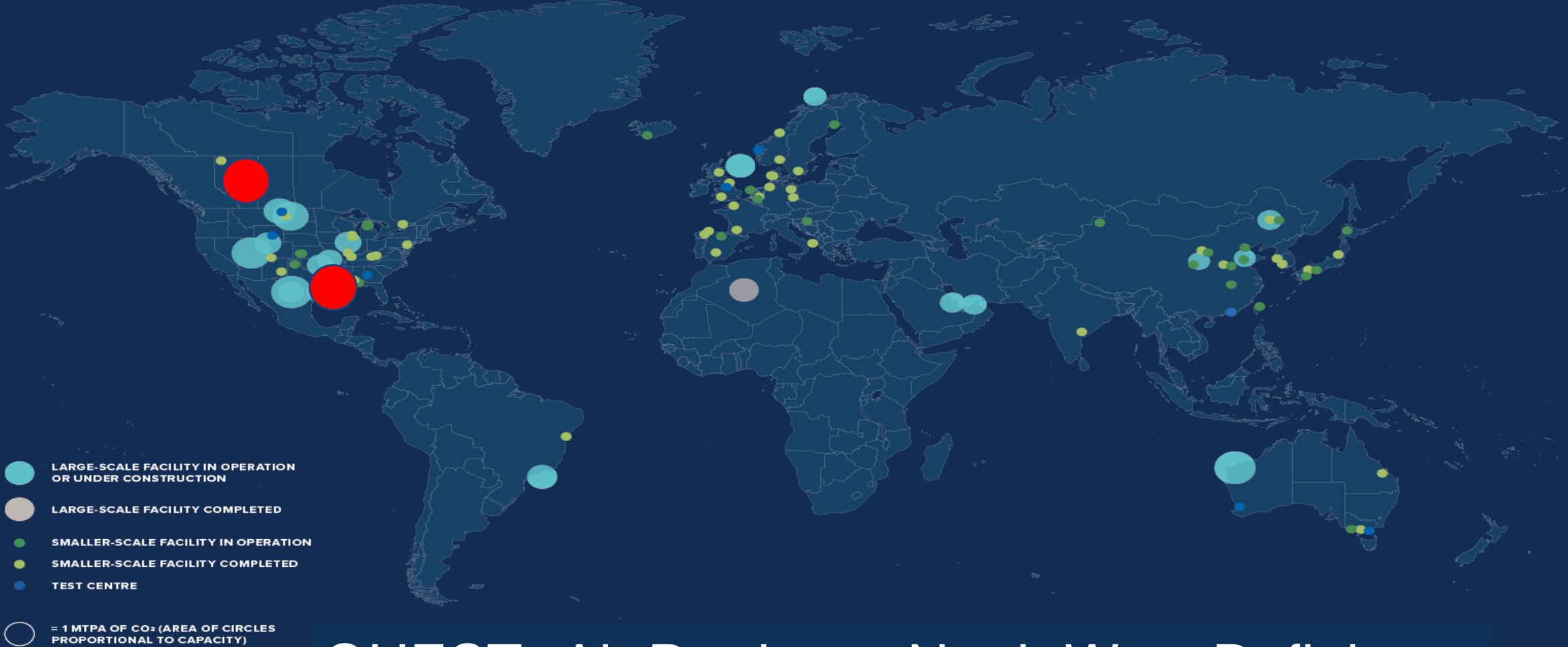
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Large Scale CCUS Facilities



43 large-scale facilities ~ 83 Mtpa*

Refining CCUS Facilities



QUEST, Air Products, North West Refining

Air Products Steam Methane Reformer

1Mtpa 2013

Adsorption - VSA

Steam Methane Reformers

\$431M Total Project Costs

- \$284M US DOE funding



QUEST

1Mtpa 2015

Absorption - Amine

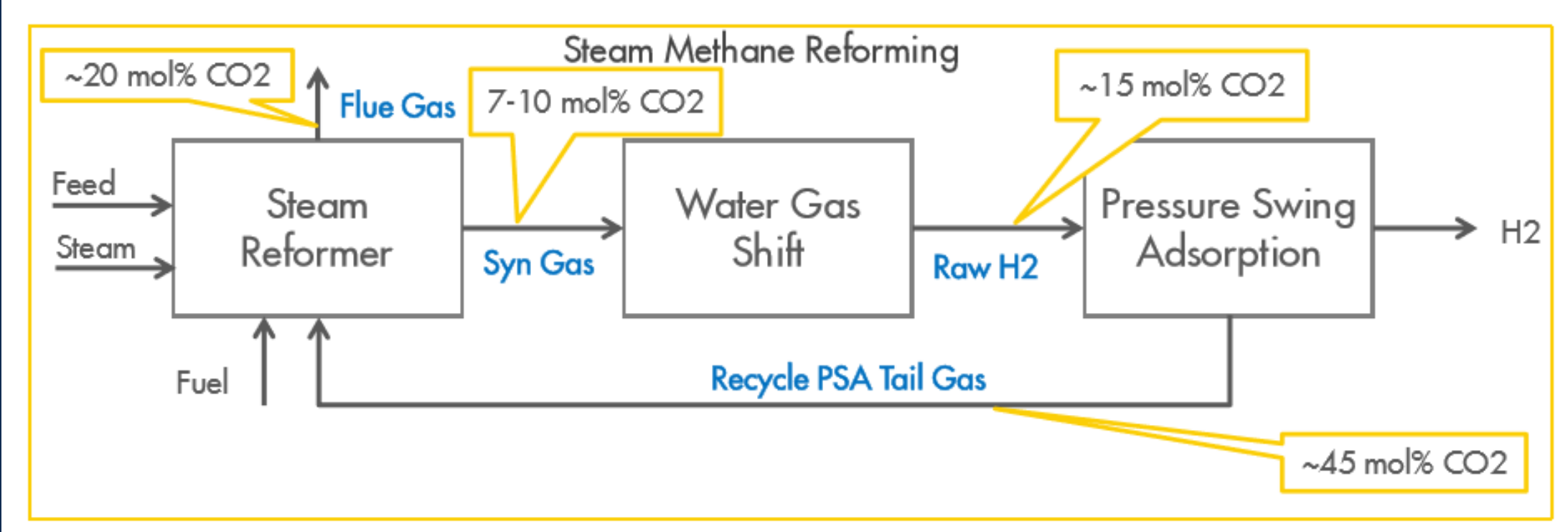
Steam Methane Reformers

\$1.35B Total Project Costs

- \$745M from Alberta
- \$120M from Canada
- 10yrs operation Credits



CO2 Capture



*Image from Shell



Policy

LCFS CCS Protocol

Output Based Allocation

Technology Innovation and Emissions Reduction

Clean Fuel Standards



THANK YOU

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