



# CCS/CCUS IN THE AMERICAS

The Americas region leads the world in the development and deployment of carbon capture and storage/carbon capture, utilization and storage (CCS/CCUS), with enhanced oil recovery (EOR) an important enabler for project development.

## STATUS OF PROJECTS

- Half of the world's 44 large-scale CCS projects are located in the Americas (13 in the US, six in Canada and one in Brazil). Of the 22 projects in operation or under construction, 16 are in the Americas.
- North America is home to all three of the world's large-scale CCS power projects in operation or under construction:
  - The Boundary Dam Integrated Carbon Capture and Storage Project in Saskatchewan, Canada (1.0 million tonnes per annum (Mtpa)) commenced operation in October 2014, and
  - The Kemper County Energy Facility in De Kalb, Mississippi, US (3.0 Mtpa) and the Petra Nova Carbon Capture Project, south of Houston, Texas, US (1.4 Mtpa) are both expected to be operational in 2016.
- One industrial project in North America was launched in 2015, with two more expected by 2017:
  - Quest in Alberta, Canada (CO<sub>2</sub> capture capacity of 1.0 Mtpa, launched in November 2015)
  - Illinois Industrial CCS in Decatur, Illinois, US (1.0 Mtpa), and
  - the Alberta Carbon Trunk Line (ACTL) with Agrium CO<sub>2</sub> Stream in Alberta, Canada (0.3 to 0.6 Mtpa).

These projects extend across a range of industries (ethanol, oil sands refining, and fertilizer production). The Quest and Illinois Industrial CCS projects will also provide the region with its first operational large-scale CCS projects that store CO<sub>2</sub> in saline geologic formations.

- Brazil is home to the Petrobras Lula Oil Field CCUS Project (0.7 Mtpa). Located approximately 300 km off the coast of Rio de Janeiro, it is the world's only offshore CO<sub>2</sub>-EOR project. By 2020, Petrobras expects to install 20 new

floating production systems in the Santos Basin, many of which will include CO<sub>2</sub>/gas re-injection for CO<sub>2</sub> storage purposes.

- Mexico has begun significant efforts to lay the foundation for CCUS project development. In its CCUS Technology Roadmap, the Mexican Government has identified five key stages that will lead to the implementation of pilot and demonstration projects and ultimately a commercial-scale project. The World Bank is also supporting a number of Mexico's CCUS capacity building efforts.

## POLICY AND REGULATORY ENVIRONMENT

- CO<sub>2</sub>-EOR is a major economic driver for CCUS deployment in the Americas and much of the current policy, legal and regulatory landscape is focused on incorporating CCUS into existing oil and gas regulations at both the federal and state, or provincial levels.
- US Federal action on CCS has focused on the regulatory environment, with the US Environmental Protection Agency (EPA) taking the lead with proposals to advance President Obama's Climate Action Plan. The EPA issued proposed regulations to address CO<sub>2</sub> emissions from both new and existing natural gas and coal-fired power plants.
- Federal funding from the US and Canadian Governments has supported the development of a number of large-scale CCS projects in North America. The US Department of Energy also supports an extensive R&D program on CCUS technologies.
- The Canadian Government's emissions reduction policy, to come into effect on 1 July 2015, will place limits on CO<sub>2</sub> from coal-fired units. The Canadian Government works with provinces through the Federal-Provincial CCS Network to establish greenhouse gas emissions reductions targets and build on a solid CCS regulatory foundation from the oil and gas sector.
- CCUS has been identified as part of Mexico's low-emission strategies. Led by the Ministry of Energy (SENER), Mexico issued its CCUS Technology Roadmap in early 2014 and is currently undertaking a review of its CCS regulatory framework.