

NATIONAL PETROLEUM COUNCIL

Meeting the Dual Challenge

*A Roadmap to At-Scale Deployment of
Carbon Capture, Use, and Storage*

Appendix C

CCUS Project Summaries

December 12, 2019

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CCUS Large-Scale Full-Value Chain projects

As of October 2019, there were 19 large-scale carbon capture, use, and storage (CCUS) projects are operating around the world, with a total capacity of about ~32 million tons (Mt) of CO₂ per year.¹ Ten of these projects are in the United States with a total storage capacity of about ~25 Mt per year. The other nine are located around the world, in Canada (2), Brazil (1), Norway (2), Saudi Arabia (1), United Arab Emirates (UAE) (Abu Dhabi) (1), China (1), and Australia (1). In addition, there were two Alberta Carbon Trunk Line (ACTL) projects under construction and expected to be operating by year-end 2019. Those projects are also included here for information in anticipation of their near-term start-up.

The next two sections of this appendix provide summary information on each of these 21 CCUS projects.

Top 10 U.S. CCUS Value Chain Projects (in order of operational date)

The 10 large-scale¹ CCUS projects located in the United States include:

1. Terrell Natural Gas Processing
2. Enid Fertilizer
3. Shute Creek Gas Plant
4. Great Plains Synfuel
5. Century Plant
6. Air Products SMR
7. Coffeyville Gasification
8. Lost Cabin Gas Plant
9. Illinois Industrial CCS
10. Petra Nova (WA Parish)

These 10 projects have a total storage capacity of about ~25 Mt per year, representing ~80% of global capacity. They span a range of CCUS supply chains from multiple industries, including natural gas processing (~17 million tonnes per annum [Mtpa]), synthetic natural gas production (~3 Mtpa), fertilizer production (~2 Mtpa), coal-fired power generation (~1 Mtpa), hydrogen production (~1 Mtpa), and ethanol production (~1 Mtpa). The Global CCS Institute estimates that these U.S. projects have captured and stored approximately 160 Mt of CO₂.

A map showing the location of each project across the United States is provided in Figure 1. Individual summary descriptions of each project are provided in the tables that follow.

¹ Large-scale projects are defined as those integrated projects that store at least 80,000 tonnes of CO₂ per year from a coal-based facility or at least 400,000 tonnes of CO₂ per year from other sources.



Figure C-1. Map of Top 10 U.S. Full-Value Chain Projects.

Terrell Natural Gas Processing, Fort Stockton, Texas	
<i>Operator</i>	Occidental Petroleum
<i>Start Date</i>	1972
<i>Size</i>	0.5 Mtpa
<i>CO₂ Source</i>	Natural gas processing
<i>Transportation</i>	220-mile Val Verde pipeline
<i>Oil Field EOR Storage Site</i>	Fields in West Texas Permian Basin
<i>Key Highlights</i>	The Terrell natural gas processing facility is the oldest operating industrial CCS project in the United States. The Terrell facility processes methane that contains between 18% to 53% of CO ₂ . This CO ₂ must be removed from the methane to meet pipeline specifications. Since 1972, the plant has supplied CO ₂ for enhanced oil recovery operations via a 220-mile pipeline linking the facility to a network of CO ₂ pipelines in the Permian Basin.
<i>References</i>	Global CCS Institute Facilities Database, https://co2re.co/FacilityData . Occidental communication with NPC CCUS Study, 2019.

Enid Fertilizer, Oklahoma	
<i>Operator</i>	Koch Nitrogen Company
<i>Start Date</i>	1982
<i>Size</i>	0.7 Mtpa
<i>CO₂ Source</i>	Koch Nitrogen’s Enid Fertilizer Plant
<i>Transportation</i>	120-mile pipeline
<i>Oil Field EOR Storage Site</i>	Northeast Purdy and the Brady Unit of the composite Golden Trend Field, as well as the Sho-Vel-Tum field, both south of Oklahoma City
<i>Key Highlights</i>	ARCO began EOR in a portion of the Sho-Vel-Tum field in 1982 and expanded in 1998. CO ₂ from Enid Fertilizer has been used since 2003, when Koch Nitrogen Company bought the Enid facility. Operations were expanded in 2010.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies

	<p>Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/enid_fertilizer.html.</p> <p>Vandewater, Bob. "ARCO hunts hard-to-get state oil with gas injection," <i>The Oklahoman</i>, June 6, 1982, https://oklahoman.com/article/1986087/arco-hunts-hard-to-get-state-oil-with-gas-injection.</p>
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Shute Creek Gas Plant, La Barge, Wyoming	
<i>Operator</i>	ExxonMobil
<i>Start Date</i>	1986
<i>Size</i>	7 Mtpa
<i>CO₂ Source</i>	Natural gas stream from fields in Wyoming, including LaBarge field
<i>Transportation</i>	142-mile pipeline
<i>Oil Field EOR Storage Site</i>	A series of fields in Wyoming, Colorado, and Montana
<i>Key Highlights</i>	<p>Production of natural gas from LaBarge field began in 1986, which is processed at the Shute Creek Treating facility, where it is separated into CO₂, methane, and helium for sale and removing hydrogen sulfide for disposal. A concentrated acid gas stream of about 60% hydrogen sulfide and 40% CO₂ is injected into a section of the same reservoir from which it was produced, safely disposing of the hydrogen sulfide and CO₂.</p> <p>In 2008, an expansion of the CO₂ capture facility brought the capacity up to 7 Mtpa.</p>
<i>References</i>	<p>Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/la_barge.html.</p> <p>Gearino, Jeff. "ExxonMobil reduces emissions in Wyo, sends more CO₂ for oil production," <i>Billings Gazette</i>, December 15, 2010, https://billingsgazette.com/news/state-and-regional/wyoming/exxonmobil-reduces-emissions-in-wyo-sends-more-co-for-oil/article_96837618-aa96-5465-aedf-fe431fc0e161.html.</p> <p>U.S. Environmental Protection Agency. "ExxonMobil Shute Creek Treating Facility SubPart RR Monitoring, Reporting and Verification Plan," February 2018, https://www.epa.gov/sites/production/files/2018-06/documents/shutecreekmrvplan.pdf.</p>

Great Plains Synfuels Plant, Beulah, North Dakota	
<i>Operator</i>	Dakota Gasification Company
<i>Start Date</i>	2000
<i>Size</i>	3 Mtpa
<i>CO₂ Source</i>	Coal gasification
<i>Transportation</i>	205-mile pipeline across border into Saskatchewan, Canada
<i>Oil Field EOR Storage Site</i>	Weyburn and Midale Fields in Saskatchewan for EOR and CO ₂ storage
<i>Key Highlights</i>	The Synfuels Plant produces methane by gasification of a low-quality coal called lignite. The plant captures more CO ₂ from coal conversion than any facility in the world. Dakota Gas captures about two-thirds of the readily available CO ₂ when running at full rates. Since 2000,

	CO ₂ emissions at the Synfuels Plant have been reduced by about 45%. The plant has captured and transported nearly 38 Mt of CO ₂ for geologic sequestration since 2000.
<i>References</i>	Dakota Gasification Company website, CO ₂ Capture and Storage page, https://www.dakotagas.com/about-us/co2-capture-and-storage Basin Electric Power Conservative website, https://basinelectric.com/sites/CMS/files/files/pdf/Fact-Sheets-Media-Kit/DGC-fact-sheet-8-19.pdf

Century Plant, Pecos County, Texas	
<i>Operator</i>	Occidental Petroleum
<i>Start Date</i>	2010
<i>Size</i>	8.4 Mtpa
<i>CO₂ Source</i>	Natural gas processing
<i>Transportation</i>	100-mile pipeline
<i>Oil Field EOR Storage Site</i>	Permian Basin Fields
<i>Key Highlights</i>	Century Plant gas processing facility is the largest single industrial source CO ₂ capture facility in North America. It processes natural gas from nearby fields in the Val Verde sub-basin that contain up to 65% CO ₂ . Since 2010, the plant has supplied CO ₂ for enhanced oil recovery operations via a 100-mile pipeline linking the facility to the CO ₂ distribution hub in Denver City, Texas. The plant was designed in 2008 with a maximum capacity of 5 Mtpa and brought online in 2010. An expansion in 2012 increased capacity to 8.4 Mtpa.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database http://sequestration.mit.edu/tools/projects/century_plant.html Occidental communication with NPC CCUS Study, 2019.

Air Products SMR, Port Arthur, Texas	
<i>Operator</i>	Air Products
<i>Start Date</i>	2013
<i>Size</i>	1.0 Mtpa
<i>CO₂ Source</i>	Existing steam-methane reformers
<i>Transportation</i>	13-mile pipeline
<i>Oil Field EOR Storage Site</i>	EOR in West Hastings and Oyster Bayou oil fields, Texas
<i>Key Highlights</i>	CO ₂ capture units were retrofitted to Air Product's two steam methane reformers located within the Valero Port Arthur refinery. This is the first-ever commercial-scale steam methane reformer (SMR) hydrogen production facility incorporating vacuum-swing adsorption carbon capture gas separation technology.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/port_arthur.html . Carolyn Preston, "The Carbon Capture Project at Air Products' Port Arthur Hydrogen Production Facility," 14th Greenhouse Gas Control Technologies Conference, Melbourne 21-26 October 2018,

	https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3365795 .
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<i>Coffeyville Gasification, Kansas</i>	
<i>Operator</i>	Coffeyville Resources
<i>Start Date</i>	2013
<i>Size</i>	1.0 Mtpa
<i>CO₂ Source</i>	Fertilizer
<i>Transportation</i>	68-mile pipeline
<i>Oil Field EOR Storage Site</i>	North Burbank Unit in Osage County, Oklahoma
<i>Key Highlights</i>	The Coffeyville Resources Nitrogen Fertilizer plant was built in 2000 by Farmland Industries. It uses a petroleum coke gasification process to produce hydrogen for use in the manufacture of ammonia for fertilizer. The CO ₂ is separated from the hydrogen through pressure swing adsorption, which originally was either used for urea synthesis or vented to the atmosphere. Since 2013 the plant has been delivering compressed CO ₂ to the North Burbank Oil Unit for enhanced oil recovery.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/coffeyville.html .

<i>Lost Cabin Gas Plant, Fremont County, Wyoming</i>	
<i>Operator</i>	ConocoPhillips
<i>Start Date</i>	2013
<i>Size</i>	0.9 Mtpa
<i>CO₂ Source</i>	Lost Cabin natural gas processing facility
<i>Transportation</i>	232-mile Denbury pipeline
<i>Oil Field EOR Storage Site</i>	Denbury's Belle Creek oil field in Montana
<i>Key Highlights</i>	In 2010, Denbury acquired the Bell Creek field with the intention of rejuvenating the once robust field by switching from water to CO ₂ injection. The injection site is the Bell Creek integrated CO ₂ EOR and Storage Project, a collaboration between Denbury and the Plains CO ₂ storage associated with a commercial scale EOR operation. To date the CO ₂ EOR operations have injected more than 10 Mt of CO ₂ . Denbury is currently extending the pipeline another 110 miles northeastward into Montana to commence EOR.
<i>References</i>	Bleizeffer, Dustin. "Deep into Wyoming," <i>Casper Star Tribune</i> , March 9, 2003, https://trib.com/business/deep-into-wyoming/article_c1b3467a-4853-53dc-8e83-ba5351679f73.html . Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/lost_cabin.html .

Illinois Industrial CCS (ADM), Decatur, Illinois	
<i>Operator</i>	Archer Daniels Midland
<i>Start Date</i>	2017
<i>Size</i>	1.1 Mtpa
<i>CO₂ Source</i>	Ethanol production
<i>Transportation</i>	2-mile pipeline
<i>Geologic Storage Site</i>	Geological storage – Mount Simon sandstone
<i>Key Highlights</i>	The ADM agricultural processing and biofuels complex produces a highly concentrated stream of CO ₂ from the ethanol fermentation process is captured, dehydrated, compressed and injected into the Mount Simon Sandstone reservoir adjacent to facility. This project is the only saline reservoir carbon storage project in the United States. The project has stored about 2 Mt since injection began in April 2017.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/illinois_industrial_ccs.html .

Petra Nova (WA Parish), Houston, Texas	
<i>Operator</i>	NRG Energy
<i>Start Date</i>	2017
<i>Size</i>	1.4 Mtpa
<i>CO₂ Source</i>	Coal-fired power generation
<i>Transportation</i>	80-mile pipeline
<i>Oil Field EOR Storage Site</i>	Hilcorp Energy's West Ranch Oilfield
<i>Key Highlights</i>	Petra Nova is the world's largest operational post-combustion CO ₂ capture facility and the first commercial-scale power sector CCS project in the U.S. It is the first instance of an independent power producer (NRG) investing in the all parts of the CCS value chain. The project captures CO ₂ using technology from Mitsubishi Heavy Industries America on a 240-megawatt slipstream of flue gas from WA Parish Unit 8. Within 10 months of operational startup in January 2017, the plant has captured more than 1 Mt of CO ₂ and boosted oil production by 1,300%.
<i>References</i>	Howard Herzog. Carbon Capture and Sequestration Technologies Program, MIT, CCS Project Database, http://sequestration.mit.edu/tools/projects/wa_parish.html . NRG website. Petra Nova: Carbon capture and the future of coal power case study, https://www.nrg.com/case-studies/petra-nova.html . Ampriester, Anthony. W.A. Parish Post Combustion CO ₂ Capture and Sequestration Project Final Public Design Report. United States: N.p., 2017, https://www.osti.gov/servlets/purl/1344080 . The Shand CCS Feasibility Study Public Report, https://ccsknowledge.com/pub/documents/publications/Shand%20CCS%20Feasibility%20Study%20Public%20_Full%20Report_NOV2018.pdf .

Major International CCUS Value Chain projects (in order of operational date)

The nine large-scale¹ CCUS projects operating worldwide (outside the United States) as of October 2019 include:

1. Sleipner CO₂ storage project, Norway (offshore)
2. Snøhvit CCS project, Norway (offshore)
3. Petrobras Santos Basin EOR Project, Brazil (offshore)
4. Boundary Dam Coal-Fired Power and CCS Project, Canada
5. Quest Project, Canada
6. Uthmaniyah Project, Saudi Arabia
7. Emirates Steel CCS Project, United Arab Emirates
8. Jilin Oil Field CO₂ EOR Project, China
9. Gorgon LNG and CCS Project, Australia

Two new large-scale CCUS projects are expected to start-up by end of 2019, both in Canada and associated with the Alberta CO₂ Carbon Trunk Line. Project summaries of these 2 projects are also included below in anticipation of their existence by the time this report is published:

10. Alberta Carbon Trunk Line with Sturgeon Refinery CO₂ Stream, Canada
11. Alberta Carbon Trunk Line with Agrim CO₂ stream, Canada

Individual summary descriptions of each project follow.

<i>Sleipner CO₂ Storage, Offshore North Sea, Norway</i>	
<i>Operator</i>	Statoil
<i>Start Date</i>	1996
<i>Size</i>	1 Mtpa
<i>CO₂ Source</i>	Natural gas processing
<i>Geologic Storage Site</i>	Utsira saline formation
<i>Key Highlights</i>	Sleipner is the world's first offshore CCS facility. CO ₂ from the nearby Alfa Nord and Gudrun fields is also separated here.
<i>References</i>	Scottish Carbon Capture & Storage, Global CCS Map, http://www.sccs.org.uk/expertise/global-ccs-map .

<i>Snøhvit, Norway</i>	
<i>Operator</i>	Equinor
<i>Start Date</i>	2008
<i>Size</i>	0.7 Mtpa
<i>CO₂ Source</i>	Natural gas – LNG facility on the island of Melkøya
<i>Geologic Storage Site</i>	Snøhvit field offshore

<i>Key Highlights</i>	The Snøhvit CO ₂ storage facilities form part of the development of gas fields in the Barents Sea, offshore Norway. The CO ₂ is captured at an LNG facility on the island of Melkøya, northern Norway, where the offshore sourced gas stream is processed. The captured CO ₂ is transported via pipeline back to the Snøhvit field offshore where it is injected into an offshore storage reservoir, more than 4 million tonnes of CO ₂ has been stored to date since 2008.
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>Petrobras Santos Basin Pre-Salt Oil Field, Brazil</i>	
<i>Operator</i>	Petrobras
<i>Start Date</i>	2013
<i>Size</i>	1 to 3 Mtpa
<i>CO₂ Source</i>	Natural gas
<i>Oil Field EOR Storage Site</i>	Lula, Sapinhoa, and Lapa fields
<i>Key Highlights</i>	Ten CO ₂ separation and injection systems aboard floating production, storage and offloading vessels anchored in the Santos Basin, off the coast of Rio de Janeiro. This is the first application of CO ₂ EOR in an offshore oil field.
<i>References</i>	Oil and Gas Climate Initiative, 2019 Annual Report, https://oilandgasclimateinitiative.com/policy-and-strategy/#annual-report .

<i>Boundary Dam, Saskatchewan, Canada</i>	
<i>Operator</i>	SaskPower (owned by Government of Saskatchewan)
<i>Start Date</i>	2014
<i>Size</i>	1 Mtpa
<i>CO₂ Source</i>	Coal-fired power
<i>Oil Field EOR Storage Site</i>	Weyburn Oil Unit
<i>Key Highlights</i>	It is the world's first post-combustion CO ₂ capture process on a coal power plant at Boundary Dam Unit 3. CO ₂ sold to Cenovus for use in EOR. Unit 3 at the Boundary Dam coal-fired power station completed a refurbishment program in October 2014 that included retrofitting CO ₂ capture facilities with a capture capacity of approximately 1 Mtpa of CO ₂ . The majority of the captured CO ₂ is transported via pipeline and used for enhanced oil recovery at the Weyburn Oil Unit, also in Saskatchewan. A portion of the captured CO ₂ is transported via pipeline to the nearby Aquistore Project for dedicated geological storage.
<i>References</i>	Sask Power. "2030 Emission Reduction Goal Progressing," news release July 9, 2018, https://www.saskpower.com/about-us/media-information/news-releases/2030-emission-reduction-goal-progressing . Scottish Carbon Capture & Storage, Global CCS Map, http://www.sccs.org.uk/expertise/global-ccs-map . Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>Quest, Fort Saskatchewan, Alberta, Canada</i>	
<i>Operator</i>	Athabasca Oil Sands Project – JV between Canadian Natural Resources (70%), Chevron (20%), Shell (10%) and Operator.
<i>Start Date</i>	2015
<i>Size</i>	1 Mtpa
<i>CO₂ Source</i>	Process gas streams from hydrogen manufacturing units
<i>Geologic Storage Site</i>	Basal Cambrian Sands saline formation
<i>Key Highlights</i>	Quest is the world's first oil sands CCS project. It captures and stores about one third of the CO ₂ emissions from the Shell-operated Scotford Upgrader which turns oil sands bitumen into synthetic crude that can be refined into fuel and other products.
<i>References</i>	Scottish Carbon Capture & Storage, Global CCS Map, http://www.sccs.org.uk/expertise/global-ccs-map , Shell communication with NPC CCUS Study, 2019.

<i>Uthmaniyah, Saudi Arabia</i>	
<i>Operator</i>	Saudi Aramco
<i>Start Date</i>	2015
<i>Size</i>	0.8 Mtpa
<i>CO₂ Source</i>	Natural gas
<i>Oil Field EOR Storage Site</i>	Ghawar oil field
<i>Key Highlights</i>	Uthmaniyah CO ₂ – EOR Demonstration compresses and dehydrates CO ₂ from the Hawiyah NGL natural gas liquids recovery plant in the Eastern Province of the Kingdom of Saudi Arabia. The captured CO ₂ is transported via pipeline to the injection site in Ghawar oil field a small flooded area in the Uthmaniyah production unit for enhanced oil recovery.
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>Abu Dhabi CCS – Emirates Steel Industries, UAE</i>	
<i>Operator</i>	ADNOC
<i>Start Date</i>	2016
<i>Size</i>	0.8 Mtpa
<i>CO₂ Source</i>	Steel production
<i>Oil Field EOR Storage Site</i>	Various ADNOC oil reservoirs
<i>Description</i>	Abu Dhabi CCS is the world's first fully commercial CCS facility in the iron and steel industry and involves the capture of CO ₂ via a new build CO ₂ Compression Facility using high purity CO ₂ produced as a by-product of the direct reduced iron-making process at the Emirates Steel Industries factory in Mussafah. The captured CO ₂ is transported via pipeline to Abu Dhabi National Oil Company ADNOC oil reservoirs for enhanced oil recovery.
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>CNPC Jilin Oil Field CO₂ EOR, China</i>	
<i>Operator</i>	CNPC
<i>Start Date</i>	2018
<i>Size</i>	0.6 Mtpa
<i>CO₂ Source</i>	Natural gas
<i>Oil Field EOR Storage Site</i>	Jilin oil field
<i>Key Highlights</i>	This facility injects CO ₂ for EOR in low permeability reservoirs of the Jilin oil field in northeast China. The CO ₂ is captured from a nearby natural gas processing plant at the Changling gas field and transported by pipeline. After 12 years of pilot and demonstration tests, the commercial operation, as Phase III, began in 2018, reaching 600,000 tonnes CO ₂ per annum. Cumulative CO ₂ injection of 1.12 million tonnes for pilot and demonstration scale operation was reached in the 2017.
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>Gorgon, Australia</i>	
<i>Operator</i>	Chevron
<i>Start Date</i>	2019
<i>Size</i>	3.4 to 4.0 Mtpa
<i>CO₂ Source</i>	Natural gas
<i>Geologic Storage Site</i>	Saline formation beneath Barrow Island
<i>Key Highlights</i>	Gorgon CO ₂ Injection is part of the wider Gorgon gas development project offshore Western Australia. Reservoir CO ₂ would be separated and compressed at facilities located on Barrow Island and then piped a short distance to CO ₂ injection wells on the Island where the CO ₂ would be injected deep in the subsurface.
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

The following two ACTL projects are planned to be operating by year-end 2019 after ACTL construction is completed. The projects are listed here for information in anticipation of their near-term start-up. However, they are not included in the count of 19 large-scale CCUS full-value chain projects in operation at the time of this report's preparation.

<i>Alberta Carbon Trunk Line with Sturgeon Refinery CO₂ Stream, Canada</i>	
<i>Operator</i>	Enhance Energy and North West Redwater Partnership
<i>Start Date</i>	2019
<i>Size</i>	1.2 to 1.4 Mtpa
<i>CO₂ Source</i>	Petcoke gasification plants for hydrogen
<i>Oil Field EOR Storage Site</i>	Devonian carbonate in a depleted oil field near Red Deer in central Alberta
<i>Key Highlights</i>	The initial sources of CO ₂ for the ACTL includes the new build North West Redwater NWR Partnerships Sturgeon Refinery. The refinery

	<p>includes a new CO₂ compression and cooling facility owned by Enhance Energy that will be able to capture 1.2 to 1.4 Mtpa CO₂ for transport via ACTL.</p> <p>The ACTL aims to transport CO₂ from a number of sources in Alberta’s Industrial Heartland, near Redwater, to declining oil fields in Central Alberta for the purpose of enhanced oil recovery.</p>
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .

<i>Alberta Carbon Trunk Line with Agrim CO₂ Stream, Canada</i>	
<i>Operator</i>	Enhance Energy and Agrium
<i>Start Date</i>	2019
<i>Size</i>	0.3 to 0.6 Mtpa
<i>CO₂ Source</i>	Agrium fertilizer plant
<i>Oil Field EOR Storage Site</i>	Devonian carbonate in a depleted oil field near Red Deer in central Alberta
<i>Key Highlights</i>	<p>The initial sources of CO₂ for the ACTL include the existing Agrium fertilizer plant. The plant will have a CO₂ recovery facility retrofitted by Enhance Energy that will be able to capture 0.3 to 0.6 Mtpa CO₂ for transport via ACTL.</p> <p>The ACTL aims to transport CO₂ from a number of sources in Alberta’s Industrial Heartland, near Redwater, to declining oil fields in Central Alberta for the purpose of enhanced oil recovery.</p>
<i>References</i>	Global CCS Institute, Facilities database, https://co2re.co/FacilityData .