

Research is underway to advance next-generation technologies toward the ultimate goal of electricity from coal that is virtually free of emissions. This approach includes commercializing carbon capture utilization and storage technologies (CCUS) for various beneficial uses such as recovering stranded oil from aging oil fields.

In the United States, greater use of carbon capture for enhanced oil recovery could produce 2 to 3 million barrels of oil daily, according to the National Coal Council, a federal advisory committee to the U.S. Secretary of Energy.¹

CCUS offers the greatest opportunity to capture, use and store significant volumes of carbon dioxide for coal, natural gas and industrial sectors at scale.

Global leaders recognize CCUS as the path to near-zero emissions. The International Energy Agency's Tim Dixon says: "In terms of CCS, its importance cannot be hidden...removing CCS from the mix will increase mitigation costs by a massive 138%."²

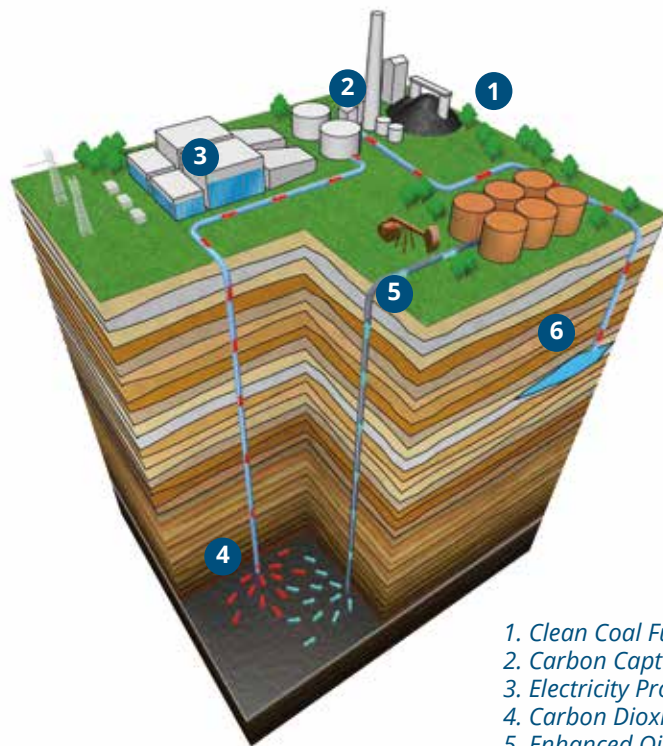
Today, there are 22 large-scale CCUS projects in operation or development around the world.³ The world's leadership is needed to bring a substantial increase in the number and diversity of these projects in the next five to 10 years.

Development of CCUS technologies also should enjoy policy parity with other low carbon energy options.

Consider the progress demonstrated by these major projects:

- The GreenGen power plant and carbon research center in Tianjin, China, is a gasification facility that would capture carbon for enhanced oil recovery in later phases of operation.

Carbon Capture Can Deliver Major Emission Improvements



1. Clean Coal Fuel Supply
2. Carbon Capture
3. Electricity Production
4. Carbon Dioxide Injection
5. Enhanced Oil Recovery
6. Saline Aquifer Storage

¹ "Coal: America's Energy Future," National Coal Council, 2006.

² International Energy Agency Greenhouse Gas, "Information Paper 2014 – 22: IPCC 5th Assessment Report and CCS," Nov. 7, 2014.

³ The Global Status of CCS, 2014; Global Carbon Capture and Storage Institute.

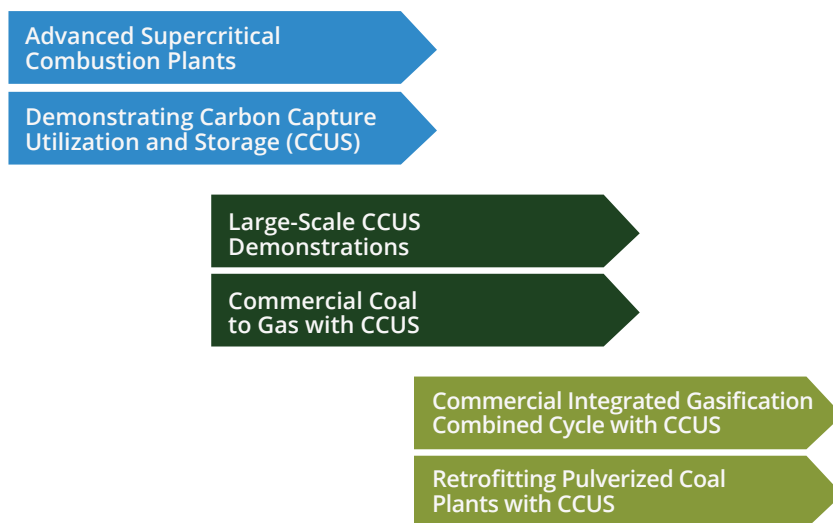
- GreenGen began operating its first unit in 2012 and is expected to increase generation to 650 megawatts.
- At full build, GreenGen could eventually be among the world's largest near-zero emissions coal-fueled power plants. Peabody is the only non-Chinese equity partner in the project.
- Canada's Boundary Dam project is the first carbon capture project in the power sector that uses carbon dioxide for enhanced oil recovery. This project was brought on line in 2014.



The GreenGen power plant and carbon research center has been called a "remarkable breakthrough" for next generation coal power and ultimately would capture carbon for enhanced oil recovery.

The Clean Energy Path to Near-Zero Emissions from Coal

Technology will enable coal power to virtually eliminate emissions



- Two additional large projects in the power sector are expected to become operational in Mississippi and Texas in the near future.
- Construction is also underway on the world's first large CCUS project in the iron and steel sector, which is in development in the United Arab Emirates.⁴

CCUS technology can achieve large emission reductions from fossil fuel use and must play a significant role alongside renewables, energy efficiency, nuclear and other low-carbon options. Success will require policy parity for CCUS, including significant government support and investment.

Urgent action is required from industry and governments to develop CCUS technology, the business models and the incentive frameworks that can help drive CCUS deployment in the power sector and in industrial applications.

Once broadly available, CCUS will deliver major emission improvements to help the world achieve its ambitious environmental goals.

⁴ The Global Status of CCS, 2014; Global Carbon Capture and Storage Institute.