



Carbon Capture with Carbonate DFC® Power Plants

FuelCell Energy’s carbon capture system utilizes **Direct FuelCell® (DFC®)** power plants to **separate CO₂** from the flue gases of natural gas or coal-fired power plants or industrial facilities while **producing ultra-clean electric power**. **This technology produces power during CO₂ capture**, rather than consuming it like other technologies.

Destroys NO_x

This fuel cell carbon capture system destroys 70% of the smog-producing nitrogen oxide (NO_x) within the coal plant flue gas.

Avoiding NO_x removal equipment saves the plant operators money and cleaner air benefits society.

Removal of particulate emissions upstream of the DFC system will also improve air quality.

Affordable Proven Solution

- Can be implemented in as little as 5% capture increments with no appreciable change in the cost of power and with minimum capital outlay
- 90% capture increases cost of power by only \$0.02/kWh. Conventional carbon capture technologies can nearly double the cost of power
- Project generates a return on capital rather than increase in operating expense
- Extends life of existing coal-fired power plants
- Enables low carbon utilization of domestic coal and gas resources
- Proven technology with over 3.6 Billion kWh total of power generated from 115+ DFC power plants at 50+ sites with customers in nine countries

How it works

The exhaust flue gas from the coal/gas plant is fed into the cathode side of the fuel cell, instead of ambient air. The CO₂ in the exhaust is transferred to the anode side of the fuel cell, where it is much more concentrated and easy to separate. The CO₂ from the anode exhaust stream is liquefied using common chilling equipment. The purified CO₂ is then available for enhanced oil recovery, industrial applications or sequestration.



11 MW Fuel Cell Park



15 MW Fuel Cell Park



20 MW Fuel Cell Park



59 MW Fuel Cell Park

“One of the main issues with technologies like carbon capture is their cost,” says Wayne Hillier, Director of Canada’s Oil Sands Innovation Alliance’s GHG EPA. “Combining carbonate fuel cell technology with carbon capture is transformative because it could bring the cost of carbon capture down, making it a more viable solution – economically and environmentally.”

Source: <https://www.cosia.ca/molten-carbonate-fuel-cells>

Canada’s Oil Sands Innovation Alliance (COSIA) is an alliance of oil sands producers focused on accelerating the pace of improvement in environmental performance in Canada’s oil sands.

“The fact that carbonate fuel cell plants are already being used for commercial power generation represents a significant step forward for the technology,” says Song P. Sit, a principal engineer at Cenovus. “It can also be adapted to capture carbon dioxide.”

Source: <https://www.cosia.ca/molten-carbonate-fuel-cells>

Cenovus is a developer of one of Canada’s most valuable resources – the oil sands, applying fresh, progressive thinking to minimize our impact on the environment while safely producing energy resources the world needs

Capturing Carbon as a Byproduct of Running a Fuel Cell

– *The New York Times*
[Article Link](#)

FuelCell Reduces Cost to Scrub Greenhouse Gases from Coal Plants

– *Bloomberg*
[Article Link](#)