



SureSource Capture By FuelCell Energy

Fuel cell carbon capture

Utilizing **SureSource** power plants to **separate CO₂** from the flue gas of natural gas or coal-fired power plants **while producing ultra-clean power**; *rather than consuming it like other capture technologies*

HOW IT WORKS:

The exhaust flue gases from the coal or gas fired system are fed into the cathode side of the fuel cell, replacing the ambient air used in typical applications, and the CO₂ in the exhaust is transferred to the anode side, where it is much more concentrated and easy to separate. The CO₂ from the anode exhaust stream is purified by chilling the stream to extract CO₂ liquid. This enables a cost effective capture as the purified CO₂ can then be transported by pipeline for Enhanced Oil Recovery applications or underground storage.

Destroys NO_x & Particulates

A separate reaction occurs in the fuel cell stacks which destroys approximately 70% of the smog-producing nitrogen oxide (NO_x) emissions in the coal or gas fired system, reducing the cost of NO_x removal equipment for plant operators and benefiting society with cleaner air.

Produces Additional Power

To capture 90% of CO₂ from a 500 MW coal plant, the power output increases 80% to 900 MW, with a cost of electricity rate of \$0.08 cents/kWh and a 78% decrease in pollutants.

AFFORDABLE & PROVEN SOLUTION:

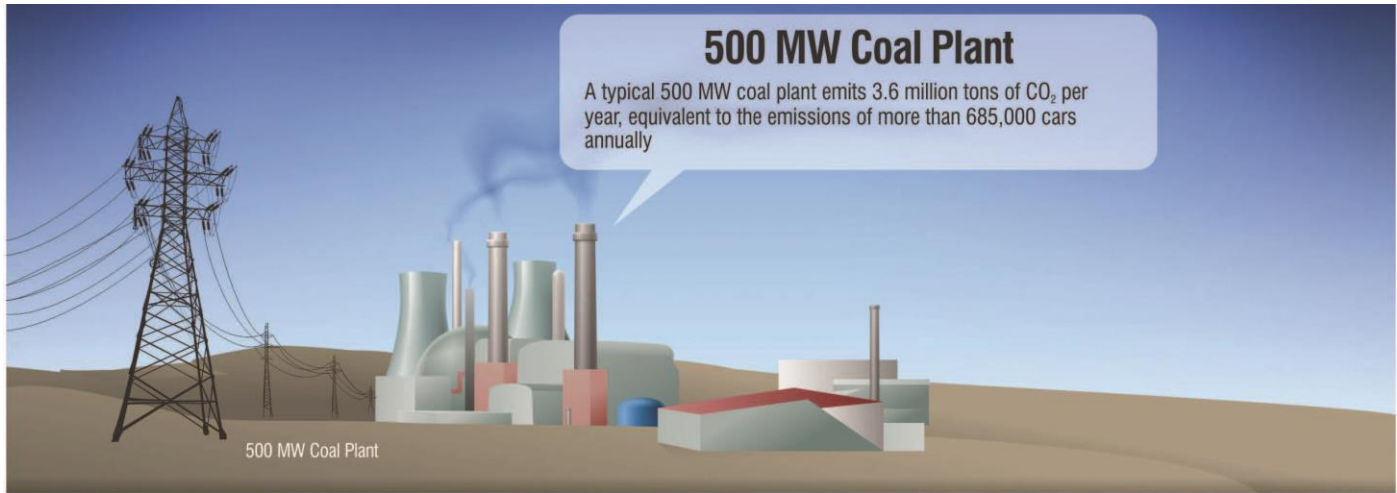
- Achieves **costs below** Department of Energy (DOE) **target** of \$40/ton
- **Destroys pollutants** and prevents the release of green-house gases while increasing overall power output
- **Generates return on capital** with energy revenue streams
- **Extends life** of existing coal-fired power plants
- Allows **low carbon** utilization of natural gas resources
- **Proven technology** with billions of kilowatt hours total of power generated from SureSource plants across three continents

NASDAQ: FCEL

www.fuelcellenergy.com



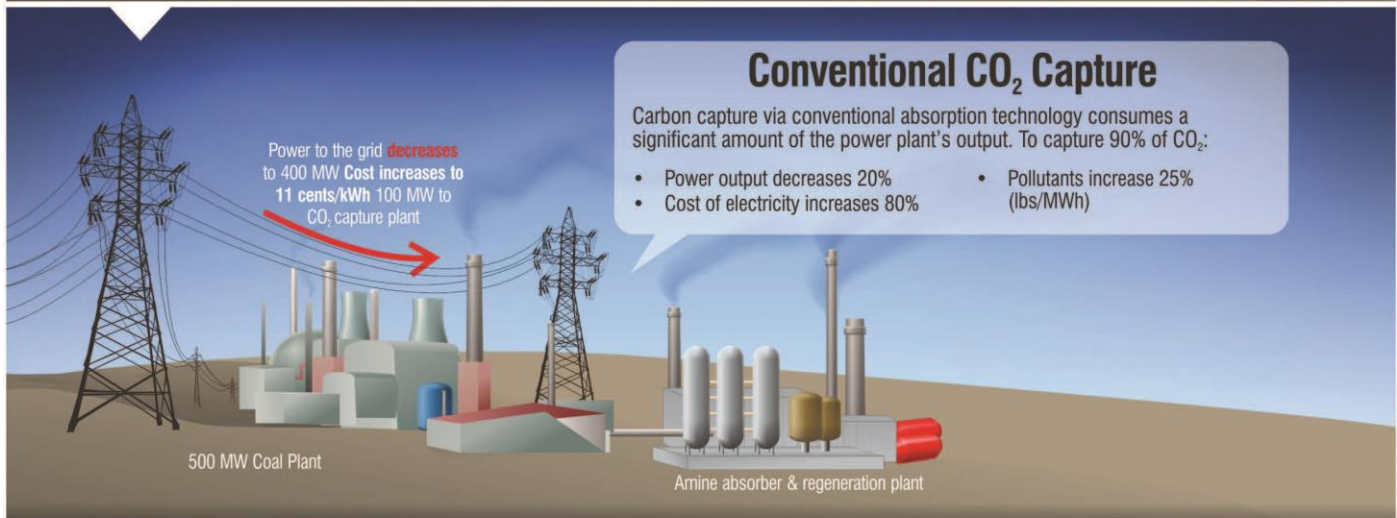
SureSource Recovery



500 MW Coal Plant

A typical 500 MW coal plant emits 3.6 million tons of CO₂ per year, equivalent to the emissions of more than 685,000 cars annually

500 MW Coal Plant



Conventional CO₂ Capture

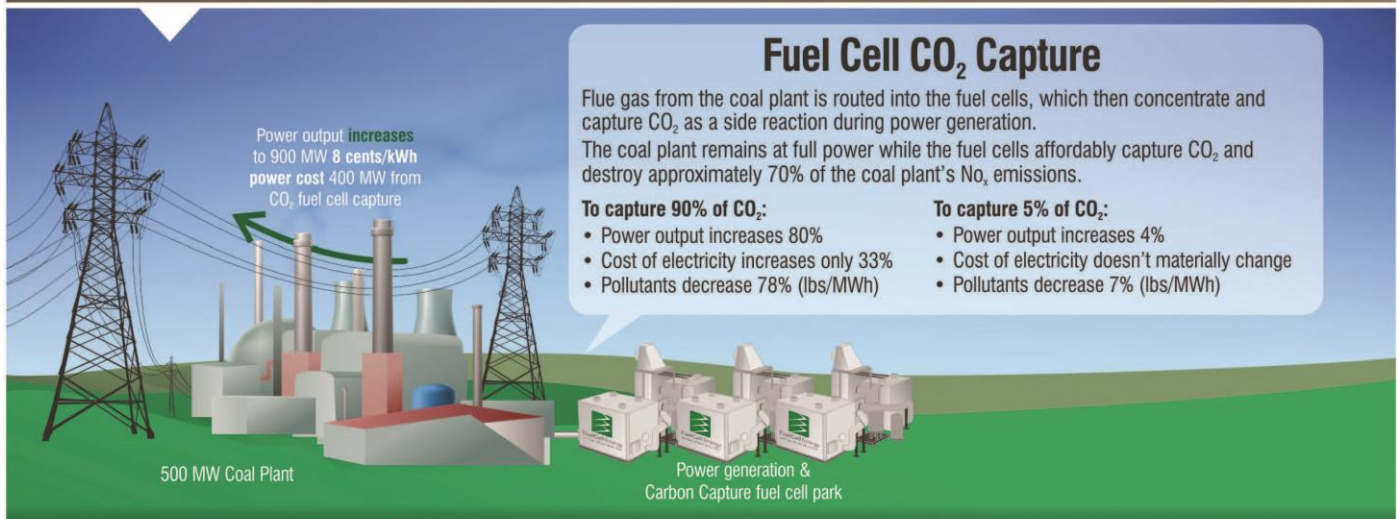
Carbon capture via conventional absorption technology consumes a significant amount of the power plant's output. To capture 90% of CO₂:

- Power output decreases 20%
- Pollutants increase 25% (lbs/MWh)
- Cost of electricity increases 80%

Power to the grid **decreases** to 400 MW **Cost increases to 11 cents/kWh** 100 MW to CO₂ capture plant

500 MW Coal Plant

Amine absorber & regeneration plant



Fuel Cell CO₂ Capture

Flue gas from the coal plant is routed into the fuel cells, which then concentrate and capture CO₂ as a side reaction during power generation. The coal plant remains at full power while the fuel cells affordably capture CO₂ and destroy approximately 70% of the coal plant's NO_x emissions.

To capture 90% of CO₂:

- Power output increases 80%
- Cost of electricity increases only 33%
- Pollutants decrease 78% (lbs/MWh)

To capture 5% of CO₂:

- Power output increases 4%
- Cost of electricity doesn't materially change
- Pollutants decrease 7% (lbs/MWh)

Power output **increases** to 900 MW **8 cents/kWh** power cost 400 MW from CO₂ fuel cell capture

500 MW Coal Plant

Power generation & Carbon Capture fuel cell park

	Coal Plant - no CO ₂ capture	90% Conventional Amine Capture	90% CO ₂ Capture w/ Fuel cells	5% CO ₂ Capture w/ Fuel cells
Output (MW)	500	400	900	522
Cost of electricity (cents/kWh)	\$ 0.06	\$ 0.11	\$ 0.08 (\$0.075 w/ ITC)	\$ 0.06
NO _x emissions (lbs/MWh)	0.6	0.8	0.1	0.6