

FUEL-STAGED OXY-COMBUSTION PROCESS AND APPARATUS

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Technology Description: Washington University in St. Louis researchers have developed new technology for clean coal combustion. The Staged Pressurized Oxy-Combustion (SPOC) system, pioneered by researchers at Dr Axelbaum's Laboratory for Advanced Combustion & Energy Research, provides a path to Carbon Control and Sequestration at a cost comparable to current coal technology.

The SPOC system improves efficiency and reduces capital costs, featuring:

- Modular boiler construction to reduce construction time and costs
- Removal of SOX, NOX, and mercury in one step via a the direct contact cooler/scrubber, eliminating other flue gas treatments
- Elimination of flue gas recycling, reducing capital costs and parasitic power consumption
- Maximal use of radiation heat transfer, improving efficiency and further reducing capital costs

The projected cost of electricity using this technology is comparable to new deployments of conventional coal technology and significantly cheaper than other 'carbon friendly' alternatives like nuclear and biomass. These technology advances clearly provide a path for coal as an integral part of a diversified and environmentally friendly energy portfolio.

Patents: [US 9,939,153](#); [US 10,767,861](#)