FETC SUCCESS
U.S. Department of Energy
Federal Energy Technology Center

CLEAN AFFORDABLE POWER

- [x] fossil energy
- [ ] environmental
- [ ] energy efficiency
- [ ] other

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Tomorrow's Power Plants

States Impacted:
All 50 states

Benefit Areas:
Energy Independence, Lower Cost of Electricity, Environment

Participants:
Pennsylvania State University, University of West Virginia, ABB, United Technologies, Carnegie Mellon, Ohio State, Babcock & Wilcox, Foster Wheeler, Oak Ridge National Lab, Pacific Northwest, EER, General Electric, FCI, Sandia, Parsons Power, Los Alamos, Burns & Roe, Seimen-Westinghouse, Dresser-Rand, Southern Illinois University, Air Products & Chemicals, EG&G, PraxAir, American Electric Power, Argonne National Labs, DB-Riley, Southern Company Services, Stamet, University of North Dakota Energy & Environmental Research Center and many others.

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Description

As a result of federal investments in the development of advanced coal- and gas-fired electric generation components and technologies, pressurized fluidized bed combustion, gasification combined-cycle, and fuel cells have been scaled up from bench-scale to commercial size and have demonstrated reliable operation at the larger sizes.

These highly advanced systems have resulted in the virtual elimination of conventional pollutant emissions: SO_2, NO_X, and particulate matter. With the integration of new materials and components, the efficiencies (and thus, CO_2 reduction) of these systems will improve even more. Reductions in carbon dioxide (CO_2), the primary greenhouse gas, are constrained by the limited efficiencies of conventional technologies.

These advanced technologies will replace (1) pulverized coal boilers as the primary means for burning coal to produce electricity, and (2) wet scrubbers as the most common method of cleaning sulfur dioxide (SO_2) from combustion flue gases.

Goals

The objective is to continue to generate power from coal while reducing or eliminating pollutant emissions.

Tangible Benefits

National: Tomorrow's power plants will integrate power systems to reduce pollutants, especially CO_2 emissions, while improving efficiency. The Vision 21 concept integrates higher efficiency power production and pollution controls into a new class of fuel-flexible electricity generation facilities. These facilities can produce electricity, high-value liquid fuels, chemicals, and process heat. This integrated use of virtually all the input energy will result in much higher efficiencies and significant reductions in pollutant emissions.

Regional: In the regions where coal and natural gas are used to produce electricity, the existing level of economic development will be maintained.

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