The National Coal Council
Power for America from America

Reliable & Resilient

The Value of Our Existing Coal Fleet

Enhancing Efficiency of Power Generation from the Existing Coal Fleet

www.nationalcoalcouncil.org/NEWS/NCCValueExistingCoalFleet.pdf

Improving thermal efficiency can reduce fuel consumption, lowers operating costs and reduce emissions, including CO_2.

The operating paradigm of coal-fired plants has changed. Today base load units routinely operate in cycle mode; boiler and emissions control systems operate in highly variable modes; maintenance intervals have been extended to 3 years or longer. These trends compromise plant generating efficiency.

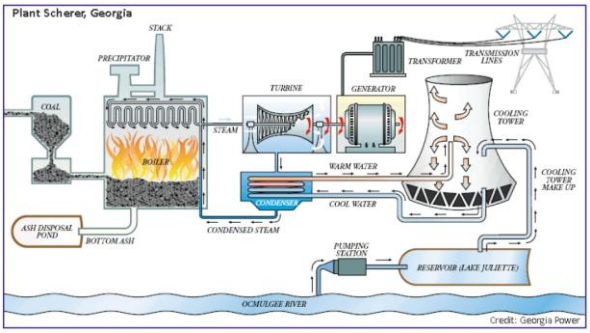
Numerous Opportunities Exist to Improve Power Plant Efficiency Today

In 2012, the average coal-fired power plant efficiency in the U.S. was 33%. State of the art plants around the world today can exceed efficiencies of 45%. While a number of efficiency measures are commercially available today, the benefits and cost are highly variable and site specific; many measures have already been deployed. Modest efficiency improvements are achievable today using existing technologies to improve heat transfer, reduce heat losses and make better use of low quality heat.

Additional RD&D Can Achieve Even Greater Efficiency Improvements

Numerous opportunities exist to achieve greater levels of efficiency improvements. Many would have a significant cost, would impose major changes to the power plant and/or would require incremental RD&D.

Achieving the most significant improvements in efficiency may be deterred by concerns that the required improvements will be characterized as a "major modification" under New Source Review regulations, resulting in additional environmental requirements that would increase costs and reduce intended efficiency gains.



Potential Efficiency Improvements

- Moisture Reduction in Low-Rank Coals Using Waste Heat
- Boiler & Steam Conditions
- Steam Turbine & Condenser Upgrades
- Employment of Advanced Materials
- Process Instrumentation & Controls
- Enhanced Boil Tube Coatings
- Low Temperature Heat Recovery
- Auxiliary Power Consumption
- Cooling System Design Improvements
- Changing Plant Thermodynamics
- Topping & Bottoming Cycles
- Alkali Injection to Reduce Fouling

NCC Recommendations

The private sector should undertake efforts to develop and demonstrate the effectiveness and reliability of efficiency-enhancing technologies for commercial plants.

DOE should lead collaborative efforts with industry to design next-generation efficiency-enhancing technologies.

DOE should work with EPA to find a way to deploy changes at existing coal-fired power plants that would result in higher fleet efficiency without imposing new emission reduction requirements.

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