Abstract

This study describes supercritical carbon dioxide (sCO2) cycle technologies for power generation from fossil fuels, particularly from coal, and reviews recent developments. The sCO2 power cycle is an innovative concept for converting thermal energy to electrical energy. It uses sCO2 as the working fluid in a closed or semi-closed Brayton cycle. These power cycles have several potential benefits, such as high efficiency, small equipment size and plant footprint (and therefore lower capital cost), and the potential for full carbon capture. Achieving the full benefits will depend on overcoming a number of technical, engineering and materials science challenges. Significant progress has been made in developing the systems, with some small, low temperature, sCO2 Brayton cycles emerging in the commercial market and a natural gas-fired demonstration power plant using a sCO2 cycle under construction. If this promising technology matures
successfully, it could address both energy and environmental challenges and radically change the power generation industry.

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