State-of-the-Art Coal Technology

Integrated Coal Gasification Fuel Cell Combined Cycle (IGFC)

Osaki CoolGen
www.osaki-coolgen.jp

The company developed and constructed the pilot project for a cleaner coal-fired power plant in collaboration with NEDO (New Energy and Industrial Technology Development Organisation under the Ministry of Economy, Trade and Industry of Japan). The pilot plant is in operation since 2017.

Coal is gasified at a high temperature, so it is possible to use low grade coals in this technology. Power is generated with a solid oxide fuel cell (SOFC) with an operating temperature of 900 to 1.000 °C using hydrogen and carbon monoxide. Simultaneously the exhaust gas (up to 1,300 °C) is utilised to run gas turbines, and the exhaust gas out of the gas turbines (up to 900 °C) runs a boiler system for generating steam to be fed to steam turbines. This combined power generation technology is accompanied by a gas purifier after gasification, that facilitate the removal of environmental pollutants including CO_2. In addition, by installing a gas separator, CO_2 can be separated and removed at a relatively low cost, and the separated CO_2 can be sequestered and stored underground and/or in the ocean (CCS: Carbon Dioxide Capture and Storage).