Test-loop Design of the Supercritical CO_2 Power Cycle with an Axial Turbine

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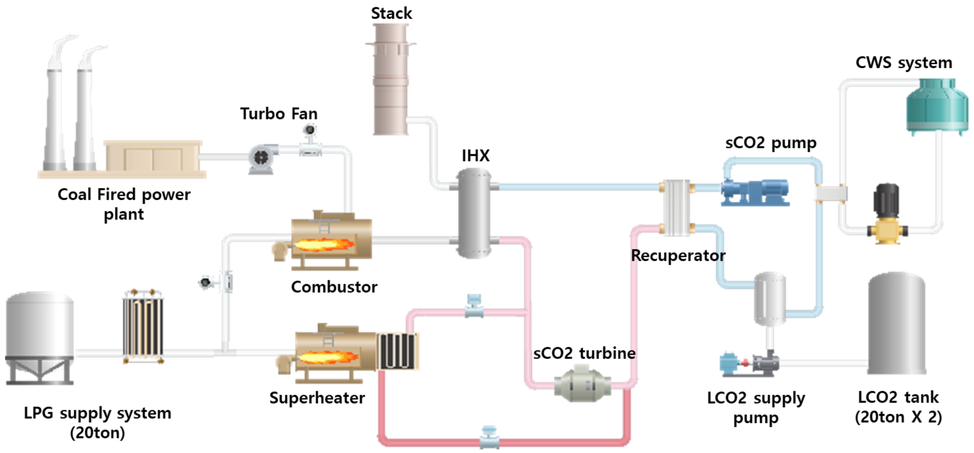
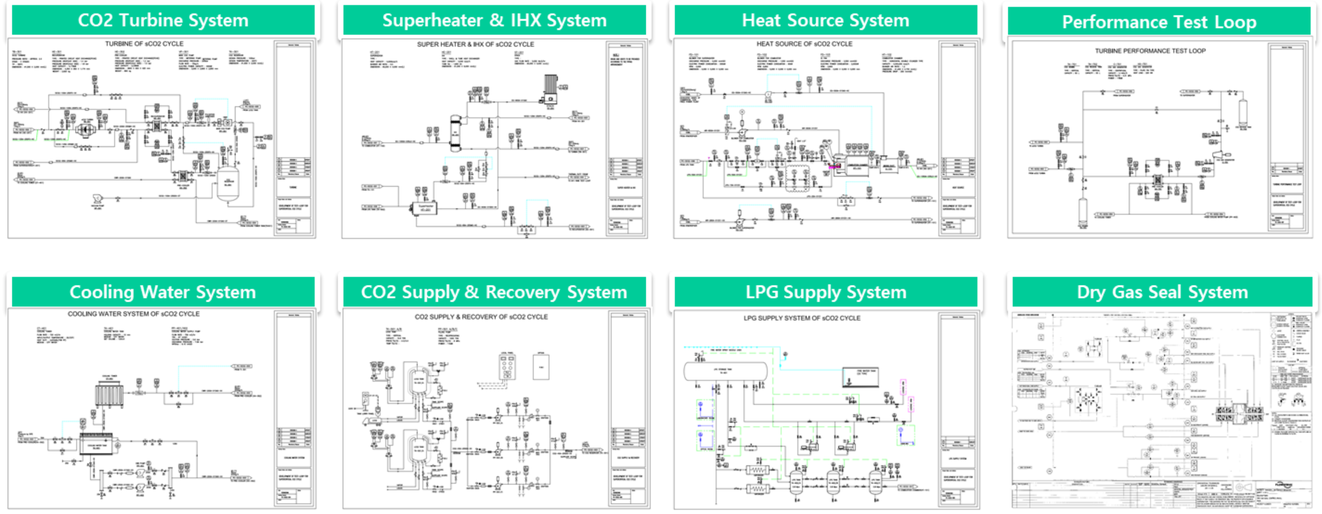
Background

- Due to the Paris Climate Change Agreement (COP21, Dec. 12, 2015), Korea should reduce 37% of greenhouse gas compared to BAU (greenhouse gas emission estimates) by 2030.
- To meet the target of Korea BAU requirement, other approaches such as sCO_2 power cycle are needed for higher power generation efficiency.
- Test-loop of the supercritical CO_2 power cycle was designed for using a part of flue gas from a coal-fired power plant as a heat source.

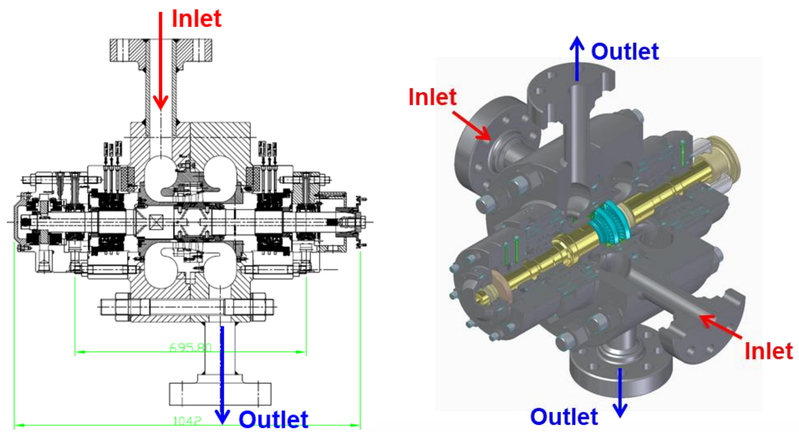
Graphical Process Flow Diagram



Piping and Instrument Diagrams



Axial Turbine for Supercritical CO_2



✓ It was selected as a two-stage turbine through thermal-FEM analysis and aerodynamic analysis by KIMM.

Test-loop 3D Modeling and Pipe Thermal Stress Analysis