Energy Efficiency Improvement & Emission Reduction for Calcining Process

Petroleum coke is usually calcined (roasted at high temperature, 1200 to 1350°C) in a gas-fired rotary kiln or rotary hearth to remove moisture, drive off volatile matter, increase the density of the coke structure, increase physical strength, and increase the electrical conductivity of the material. The result is a hard, dense carbon (calcined petroleum coke) with low hydrogen content and good electrical conductivity. These properties along with low metals and ash contents make calcined petroleum coke the best material currently available for making carbon anodes for smelting of alumina to aluminum.

Ongoing Research

-- Combustion Efficiency --

- Develop a 3-D computational model to simulate the thermal flow behavior and reaction inside the kiln & pyroscrubber
- Study the effective utilization of volatiles and tertiary air to improve combustion efficiency

-- Fuel Usage Reduction --

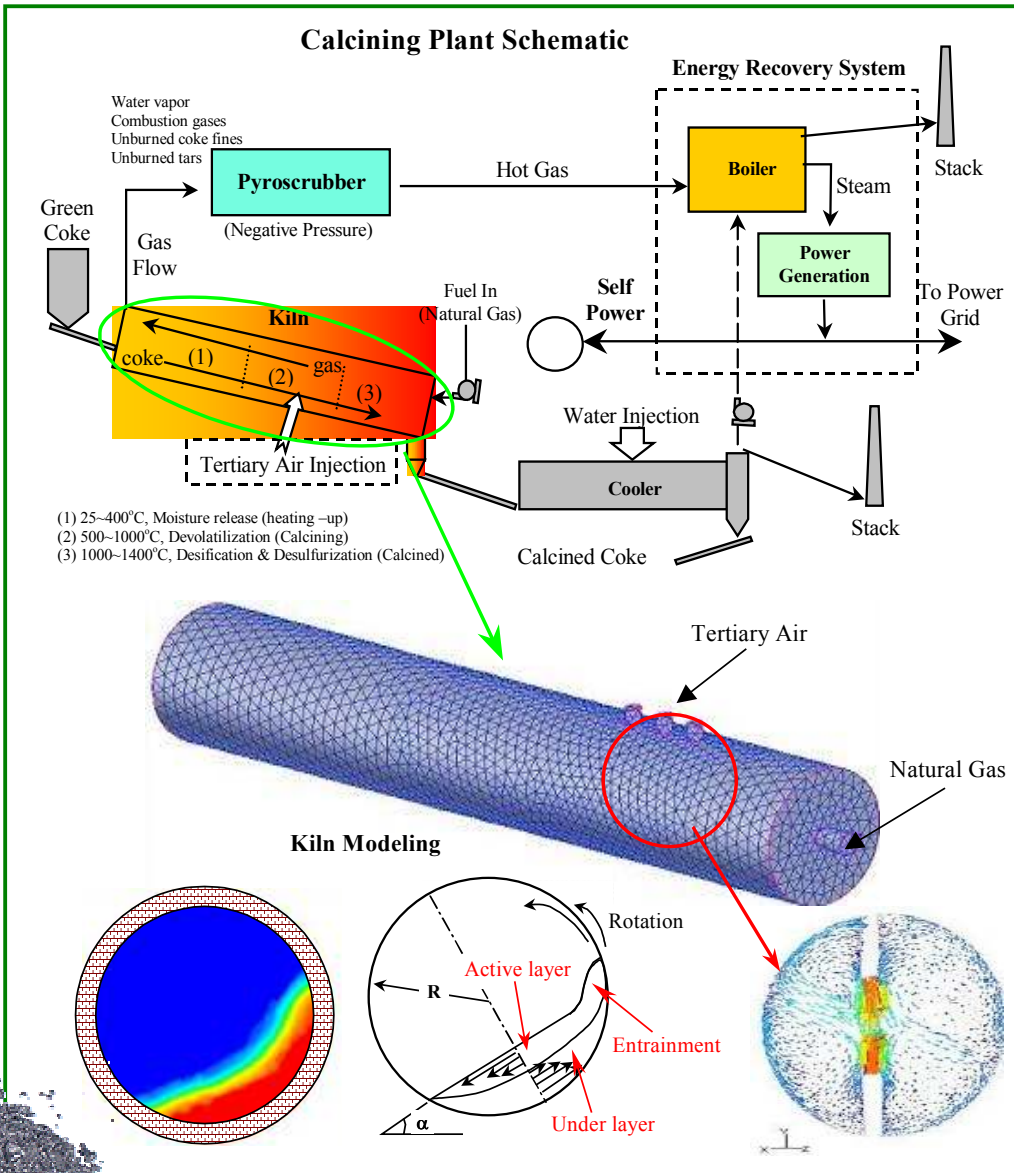
- Investigate methods to minimize or completely remove natural gas consumption

-- Waste Heat Recovery --

- Improve utilization of the low-grade energy

-- Emission Control --

- Reduce NO_X & SO_X emissions from the kiln and pyroscrubber
- Reduce particle carryover



Energy Conversion & Conservation Center

In collaboration with CII Carbon, L.L.C.