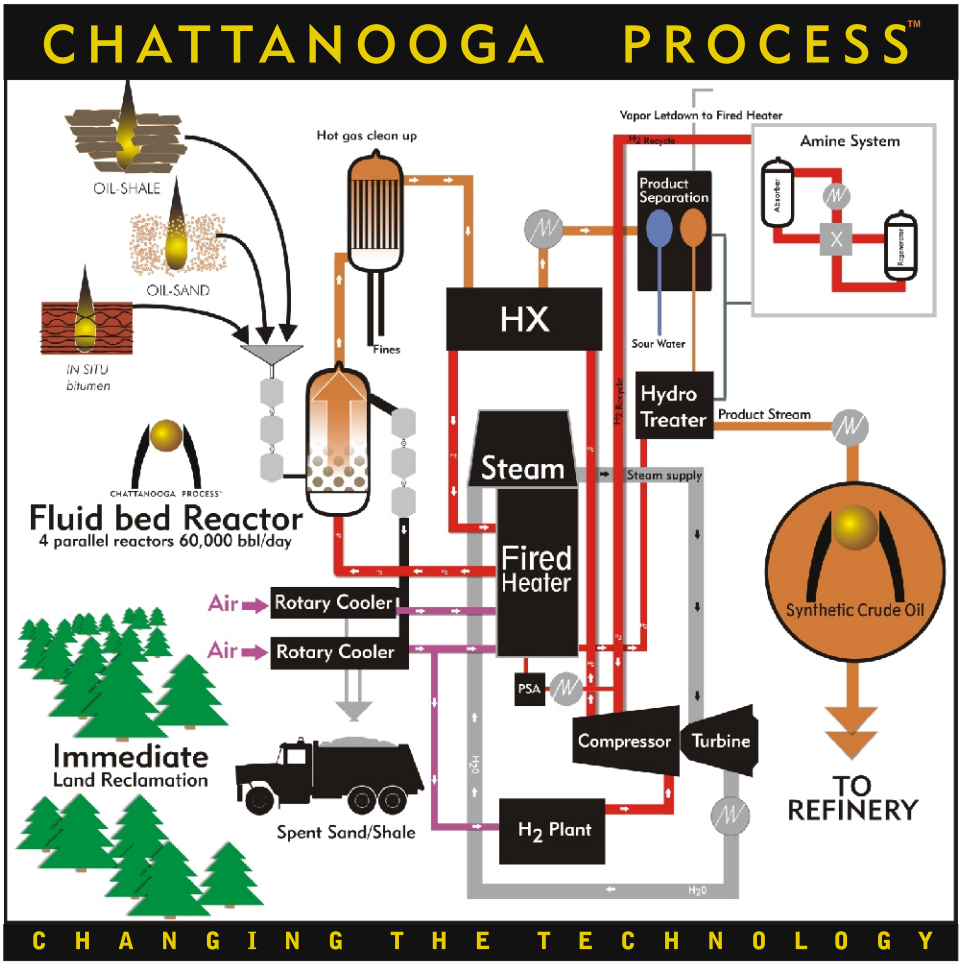
Central to the Chattanooga Process is the fluid bed reactor and its associated fired hydrogen heater.



Hydrogen is used as the heat conveyor to the reactor, reactor bed fluidizing gas and reactant. The hydrogen is heated in an adjacent fired heater which is fueled by oil produced by the process to minimize natural gas requirements. Combustion air for the fired heater and also the associated hydrogen plant reformer is preheated by cooling the spent sand or shale discharged from the reactor.

Reactor overhead gases are cleaned of particulate solids in a hot gas filter, cooled and hydrocarbon products condensed and separated from the gas stream. The liquid product produced at this stage is then further subjected to light hydro-treating to produce a very low sulfur high grade synthetic crude oil.

The excess hydrogen, light hydrocarbon (HC) and acid gases are passed through an amine scrubbing system to remove hydrogen sulfide which is converted to elemental sulfur down stream in a Claus plant. Excess hydrogen and light HC gases, stripped of the acid gases, together with new make-up hydrogen are admitted to a steam turbine driven centrifugal compressor for re-compression and recycling through the fired heater to the reactor. Steam for the turbine is generated by recovering waste heat from the fired heater. Compressor power requirements are minimized by maintaining a low pressure drop around the process loop.

A slip stream of recycle gases is taken from the compressor discharge and passed through a purification system to remove light HC gases produced in the reactor. The purified hydrogen gas stream is returned to the compressor inlet. The light HC gases become feed stock to the integrated hydrogen plant thus again minimizing the requirement for purchased natural gas.

Recovery of waste heat, power co-generation and the utilization of the light HC gases produced in the reactor as feed stock for the hydrogen plant make the Chattanooga Process virtually self sufficient obtaining its energy requirements from the primary plant feed stock.

For more information:
www.chattanoogaprocress.com