

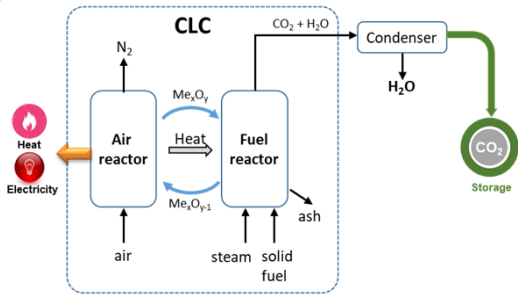
50 kW_{th} CL unit for SOLID fuels

The unit was built in 2013 with a nominal capacity of 50 kW_{th} for CLOU and 20 kW_{th} for *ig*-CLC process.

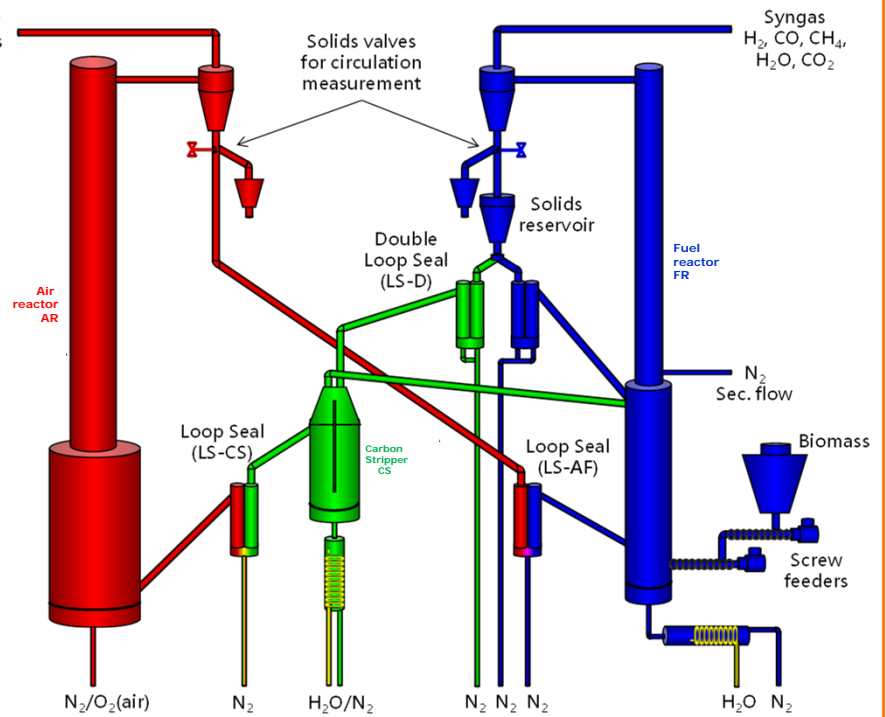
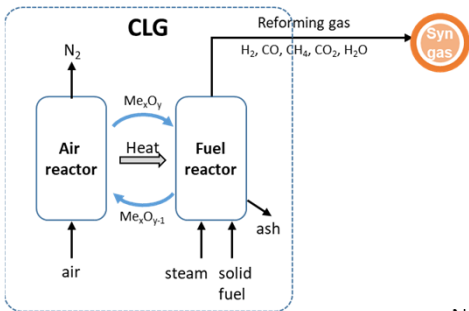
It consists of two interconnected circulating fluidized beds (Fuel and Air reactors), a double loop seal that allows the independent variation of the solids inventory, solids circulation rate and fluid-dynamic conditions and a Carbon Stripper to separate the unconverted char particles from the oxygen carrier and so increasing both the CO₂ capture and the fuel conversion efficiency. The unit is equipped with on-line gas analyzers and tar recovery system.



Chemical Looping Combustion



Chemical Looping Gasification



N₂/air in the AR was used for controlling oxygen used for syngas production in CLG

		FR	AR	CS
Height	(m)	4.00	4.80	0.70
Bottom D	(m)	0.10	0.30	0.15
Upper D	(m)	0.08	0.08	-
Solids inventory	(kg)	45		

Fuel	Oxygen carriers
Coal (<i>ig</i> CLC, CLOU)	Ilmenite, MnFeTi
Olive Stones (<i>ig</i> CLC)	Tierga (iron ore)
Pine forest residue (CLG, CLOU)	Ilmenite, Cu30MnFe
Wheat Straw pellets (w/ or w/o torrefaction) (CLG)	Ilmenite



Operational experience (2022)

***ig*CLC: 180 h**
CLG: 100 h

MILESTONES

First CLG operation controlling oxygen supply in AR

2000 2005 2010 2015 2020 2025

NEGATIVE CO₂

First biomass-fueled CLOU in a continuous unit