

“Generation of Hydrogen through Thermo-Chemical Gasification of Biomass”, funded by CSIR-NMITLI.

Project Leader / Co-ordinator:

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Total Project Cost :

Rs 45 Lakh (Rupees forty five lakh only)

Brief Description:

An important application of biomass conversion could be generation of hydrogen which is a green fuel and suitable for application in **fuel cell** and other devices as fuel. Thermo-chemical gasification of biomass has been identified as possible process of renewable hydrogen production. Fluidized Bed (FB) gasification ensures better conversion. This application is dependent on tar elimination and CO conversion by water gas shift reaction. As reported extensively in literature biomass steam gasification results in conversion of carbonaceous materials to gases like H₂, CO, CO₂, CH₄, light hydrocarbons, char, tar etc. Conversion of tar component by cracking followed by shift reaction leads to increased quantum of H₂ generation.

Objective:

- To investigate the process of Hydrogen generation through thermo-chemical fluidized bed gasification of biomass followed by tar cracking.
- To develop a lab pilot unit for demonstration.
- Purification of Hydrogen for hydrogen generation through steam reforming, shift reaction and PSA (Pressure Swing Adsorption)

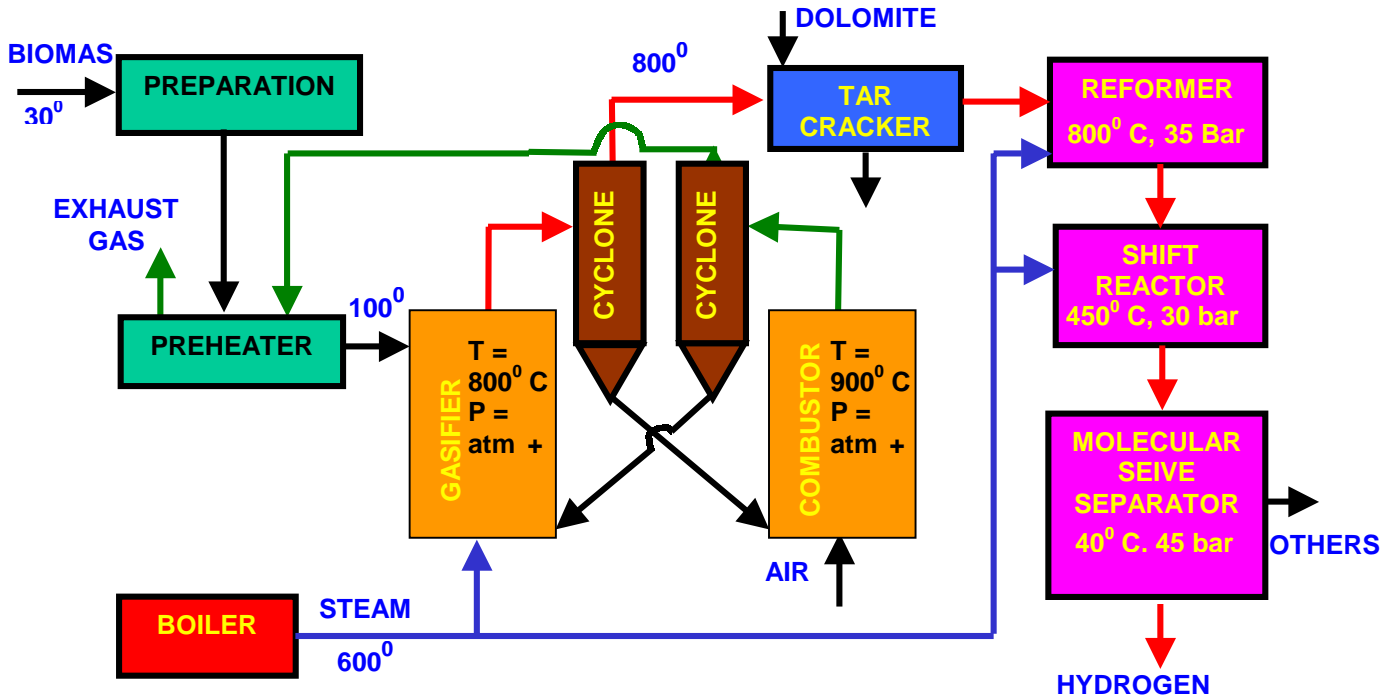
Scope:

- Development of Biomass pre-treatment plant.
- Development of fluidized bed Biomass Gasifier.
- Development of circulating fluidized bed tar cracker.
- Development of gas cleaning system
- Modeling and analysis
- Techno economic assessment.

Benefits:

- Biomass is renewable and net CO₂ impact is small.
- Lesser pollution and greenhouse effect.
- It provides a method for biomass utilization with better efficiency.
- It has potential to accelerate realization of hydrogen as one major fuel of the future.

Flow Chart:



FLOW DIAGRAM OF PROPOSED CYCLE