

Field performance of the Gasifier system

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Field Expectations From Gasifier System

- The system should be capable of performing 24 X 7 X 300.
- Use seasonal fuel at low cost.
- Lower down time - reliability of the system; service support.
- Economic viability; return on investment - guaranteed performance.
- Environmentally benign - low on pollutants and emissions.

Design of Gasifier System Elements

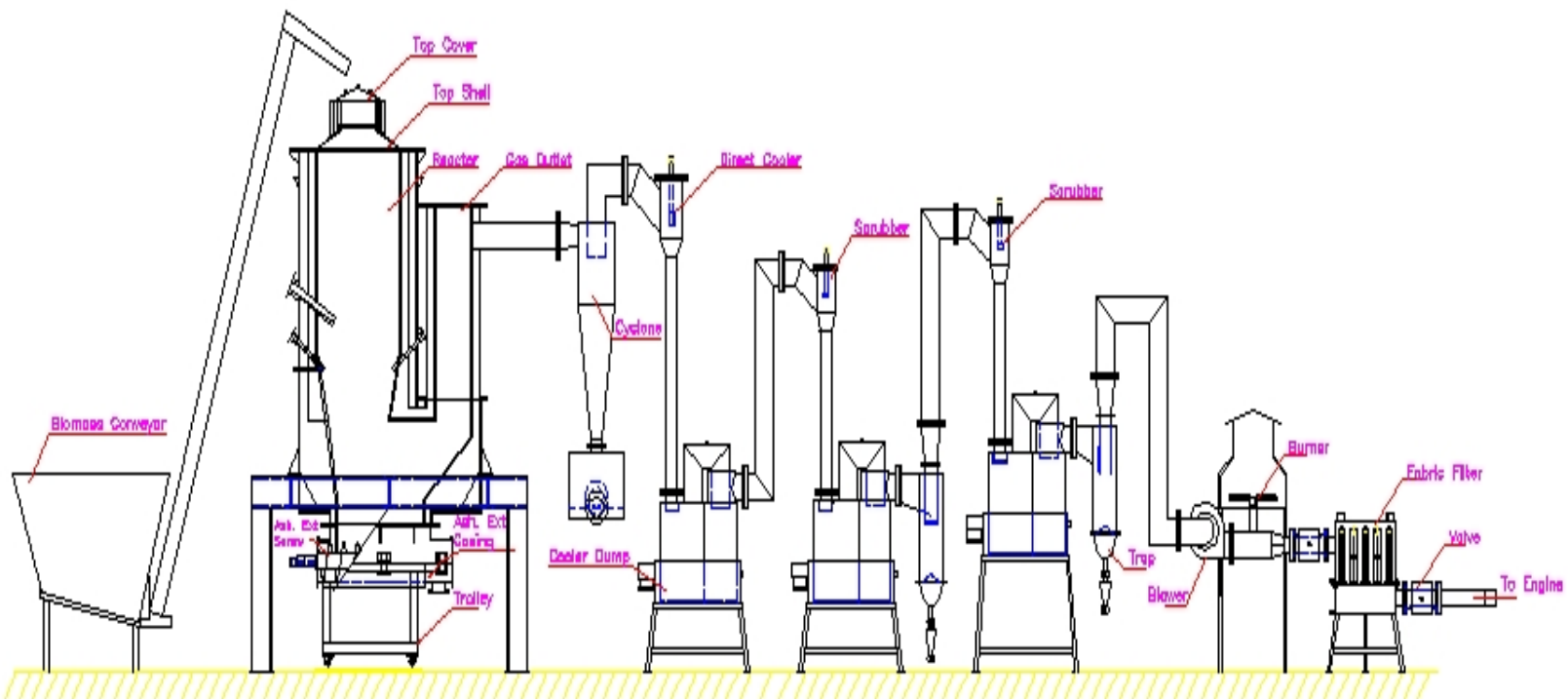
- Designed like a typical power plant.
- Online facilities of ash and particulate extraction from reactor and cyclone.
- All necessary accessories identified and incorporated.
- Scrubbers and filter designed for low pressure drop.
- Tar and Particulate level less than 1 PPM.

Gasifier Accessories

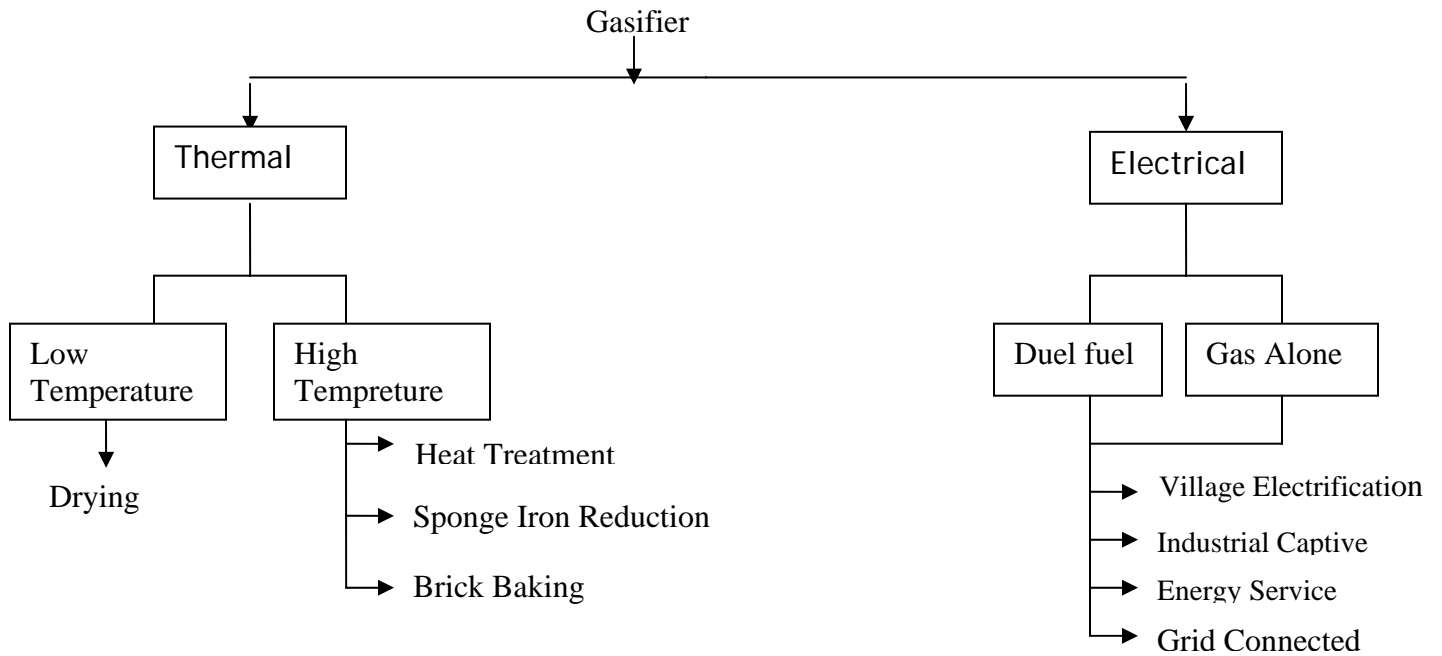
- Biomass conveying - Hoist systems for handling various biomass with different shapes and sizes.
- Water treatment system - Cooling and treatment for recirculation, discharge water confirming to CPCB standards.
- Biomass Drying system - Waste heat from Engine and Furnace exhaust used for biomass drying.

- Biomass Sizing - Manual and semi-automatic saw cutter and coconut shell crusher.
- Automation - For startup and shutdown operations including emergency and other safety aspects.

System configuration



Applications Served



Biomass Used

- Fire wood (Casaurina, Eucalyptus, Prosopis Juliflora etc.)
- Ipomea, Cotton stalks, Mulberry stalks.
- Coconut shell and fronds.
- Briquettes of Saw dust, Rice husk and Marigold spent meal.

Summary of field Installations

- Total number of systems installed : 30
- Total thermal : 7 Systems.
- Total electrical : 23 Systems (3 MWe).
- Oil saved : 3500 kilo-liters.

- Total Biomass used : 13500 tonnes.
- 15000 litres/day diesel being saved.

System configuration - 1 MWe

- System designed to handle agro residues, coconut shells,
- PLC based automation for data acquisition and control.
- Water treatment plant to recirculate the cooling water.
- Activated charcoal as by product.

Some elements





Performance

- Total hours of run : 5000
- Total units generated : 1.85 million kWh.
- Total biomass used: 1700 tonnes.
- Total fossil fuel used: 170 tonnes.
- Cost of generation now: Rs. 3.10/kWh

- Expected generation cost
with gas engines on order: Rs. 2.50/kWh

MVIT - College

An engineering college connected to the state grid uses a significant amount of diesel engine support to meet the energy demand

- About 50 % of the electricity is generated using diesel generator sets.
- Average cost of electricity upwards of Rs. 5.50 per kWh - considering the grid and captive generation cost.

Gasifier system

System capacity:

Phase 1 (Jan 2002)

- Initially a 100 kg/hr gasifier coupled to two 45 kW dual fuel generation system
- To optimize the plant load factor



Operations:

- In a 24 hour cycle about 12 hours on maximum load condition and remaining hours at 50 - 60 % of the rated conditions
- Average number of units generated per day 750



Phase 2 (Jun 2002)

- Additionally a 100 kg/hr gasifier coupled to 100 kW dual fuel generation system.
- To service more units to the client.

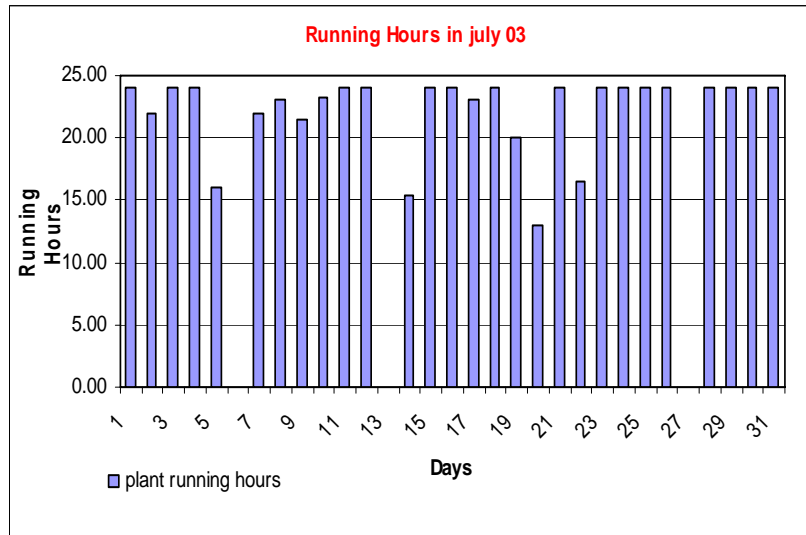
Operations

- In a 24 hour cycle about 12 hours on maximum load condition and remaining hours at 50 - 60 % of the rated conditions.
- Average number of units generated per day 1400.

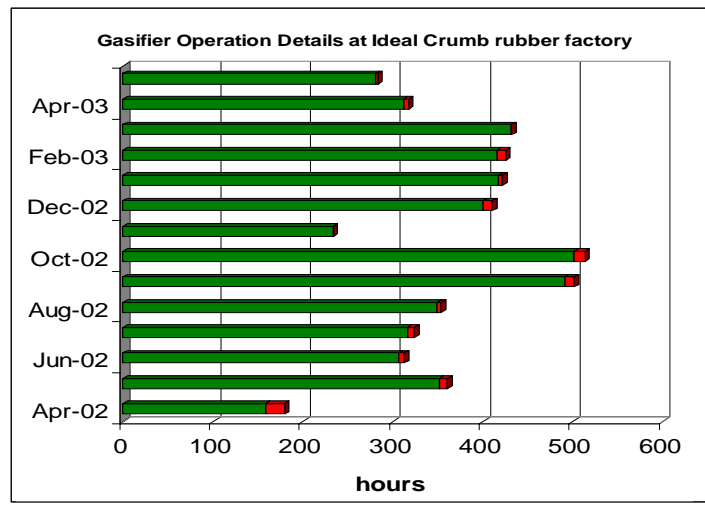


Performance

- Fuel used : wood chips.
- Performance : Operated over 2800 hr.
- Total electrical units generated : 0.25 million kWh
- Total biomass used : 220 tons



Performance - Ideal crumb



- Green -operational time.

- Red - Down time.
- Typical uptime of gasifier is > 98%.
- System performance same as Oil fired system in all aspects.

Overall O and M

