

Biomass High-Electrical Efficiency Units



HRS Units for Electricity Generation and Cogeneration from Biomass



Turboden has developed new models of HRS turbogenerators capable of high electrical efficiency. HRS models can operate both in dissipative condition, maximizing the electrical output, and in cogeneration mode, with the opportunity to provide heat with water temperature up to 60° C while adjusting for seasonal thermal load and maximizing the utilization of the biomass. The Organic Rankine Cycle (ORC) units can be fed by thermal oil or saturated vapor.



(Layout Turboden 10)

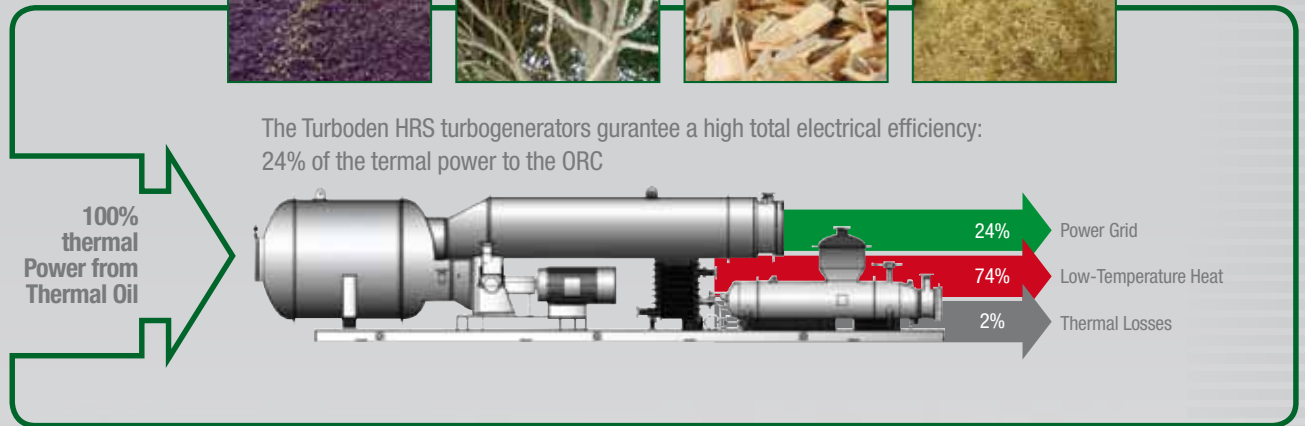
Features

- High-electrical-efficiency (~24%)
- Size range from 1 MW to 3 MW for a single unit

Pratt & Whitney. It's in our power.™



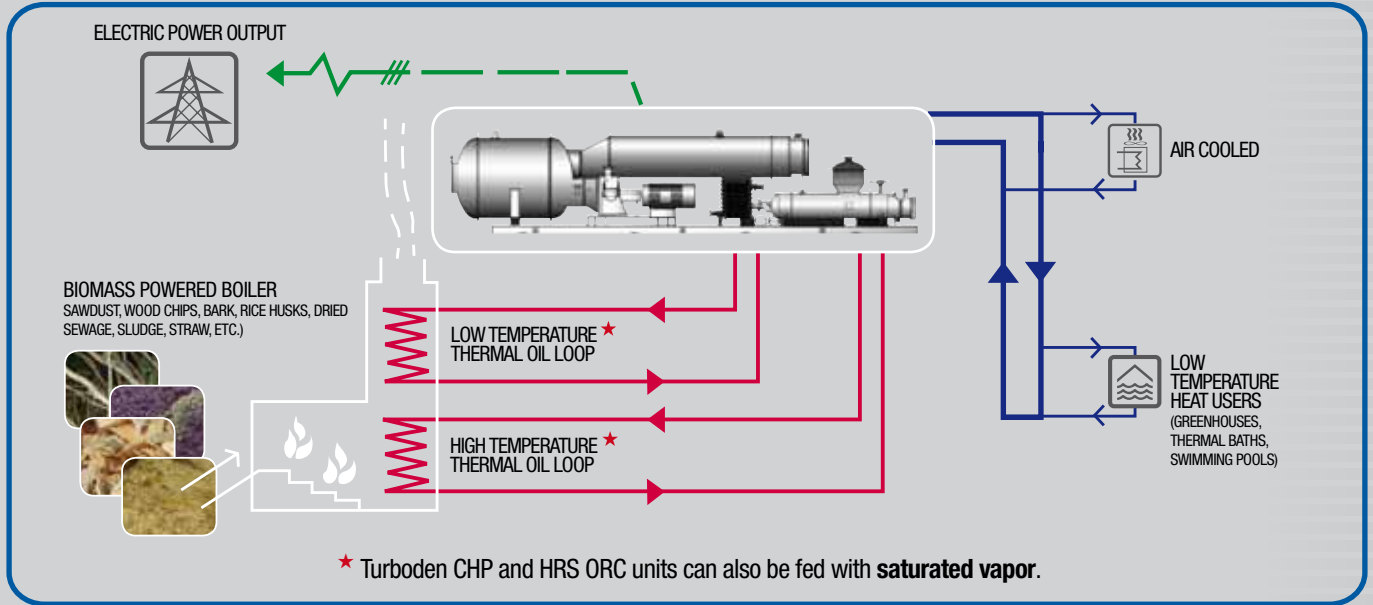
The Turboden HRS turbogenerators guarantee a high total electrical efficiency: 24% of the thermal power to the ORC



Biomass - High-Electrical-Efficiency Units

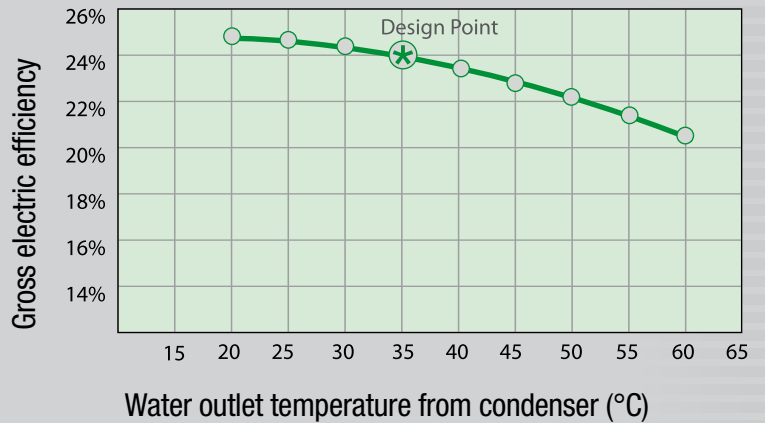
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Example of a High Efficiency ORC in Biomass Application (Split Type)



Gross Performance of the Turboden HRS Modules at Various Condensation Water Temperatures

⊛ Value of gross electrical efficiency calculated as the ratio of electric power output at generator terminals to the thermalpower input to the ORC at the design point



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