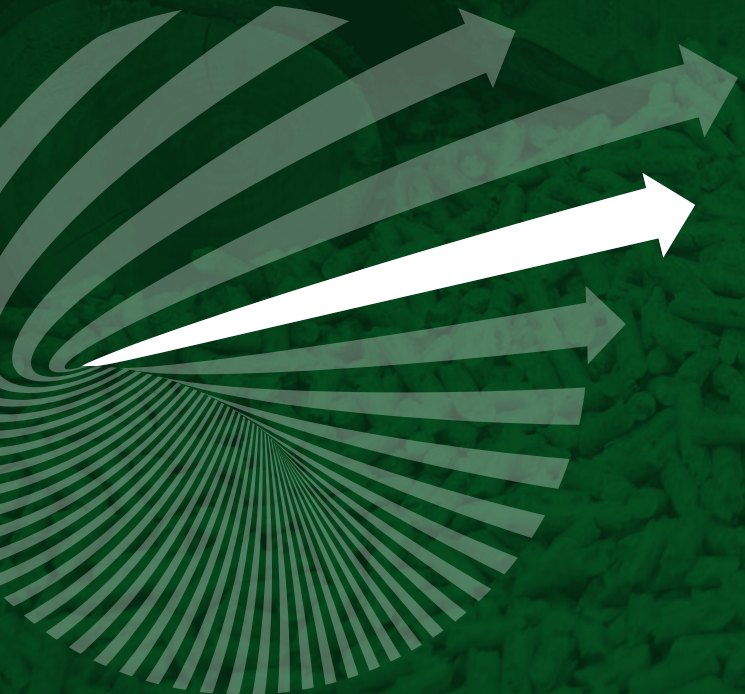
EXERGY



03/ POWER GENERATION FROM BIOMASS

EXERGY's Radial Outflow Turbine technology is the most effective solution when it comes to power generation from biomass.

EXERGY's Radial Outflow Turbine technology is the most effective solution when it comes to power generation from biomass. Its high efficiency, availability and most of all, ability to follow load dependent on fuel supply, define the ORC technology as the most valuable choice for biomass plants of any size.

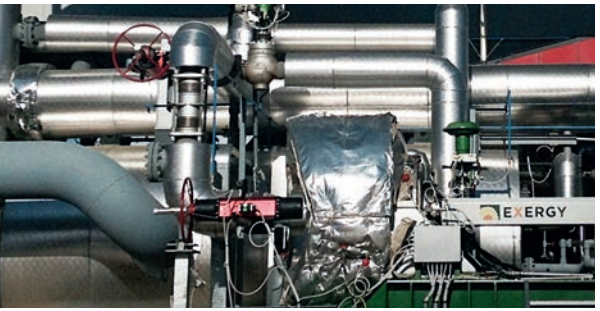
EXERGY combines the ORC module with a biomass boiler, guaranteeing best performance and highest profitability.

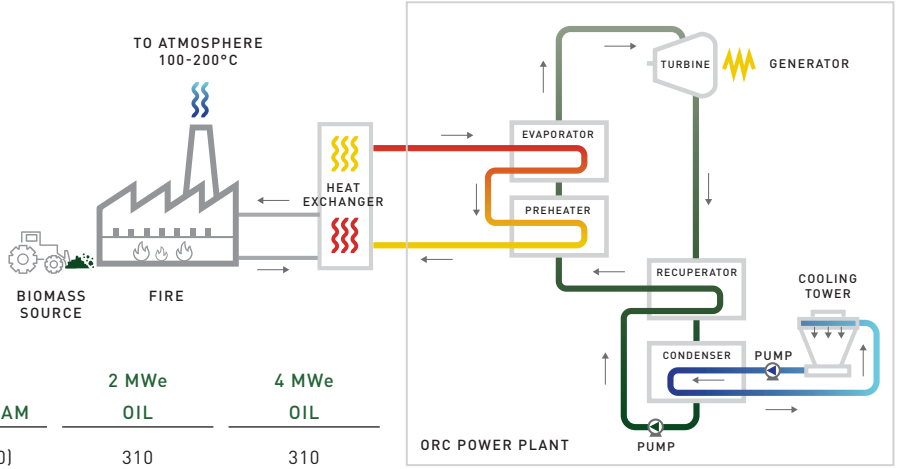
The ORC module can be used in the production of direct electrical power or cogeneration of electrical and thermal power for purposes such as:

- COGENERATION FOR INDUSTRIAL PROCESSES
- DISTRICT OR RESIDENTIAL HEATING
- TRIGENERATION (PRODUCTION OF WARM AND COLD STREAMS FOR HEATING AND COOLING PURPOSES)

Replacement of the steam turbine with the EXERGY Radial Outflow Turbine (ROT) brings a number of additional maintenance and operational advantages, defining the EXERGY solution among the top technologies that offer:

- HIGH POWER AND EFFICIENCY TO CAPITAL COST RATIO
- HIGH RELIABILITY THANKS TO PROVEN TECHNOLOGY
- FLEXIBILITY IN BIOMASS FEED QUALITY (THE BIOMASS FEED OF THE BOILER INCLUDES: WOOD INDUSTRY WASTE, OLIVE WASTE OR OTHER SECONDARY BIOMASS)
- SMALL, MODULAR, LIGHTWEIGHT PLANTS FOR EASY INSTALLATION
- FEW CIVIL WORKS REQUIRED
- SIMPLIFIED OPERATIONS AND REDUCED MAINTENANCE
- NO WATER CONSUMPTION





BIOMASS FLOW DIAGRAM

PLANT OUTPUT	POWER MEASURE	300 kWe OIL / STEAM	600 kWe OIL / STEAM	1 MWe OIL / STEAM	2 MWe OIL	4 MWe OIL
THERMAL OIL / STEAM INLET TEMPERATURE	°C	310 (230)	310	310 (230)	310	310
THERMAL OIL OUTLET TEMPERATURE	°C	240	240	240	240	240
COGENERATION WATER TEMPERATURE (IF REQUIRED)	°C	70-90	80-100	70-100	80-100	80-100
GROSS POWER	kWe	300	600	1000	2000	4000
GROSS EFFICIENCY (WITH / WITHOUT COGENERATION)	%	18 / 21 (16)	15 / 23	20 / 24 (18)	20 / 25	20 / 25
BIOMAS CONSUMPTION (LHV = 2400 KCAL / KG)	TON / YEAR	6.000 / 5.000	11.000 / 8.000	16.000 / 14.000 (18.000)	33.000 / 27.000	66.000 / 54.000