ORGANIC RANKINE CYCLE

POWER GENERATION FROM WASTE HEAT

- Recover heat that would otherwise be lost and convert it into electricity
- Options for low operating temperatures.
- Produce clean electricity with zero emissions.

WASTE TO ENERGY

OIL & GAS

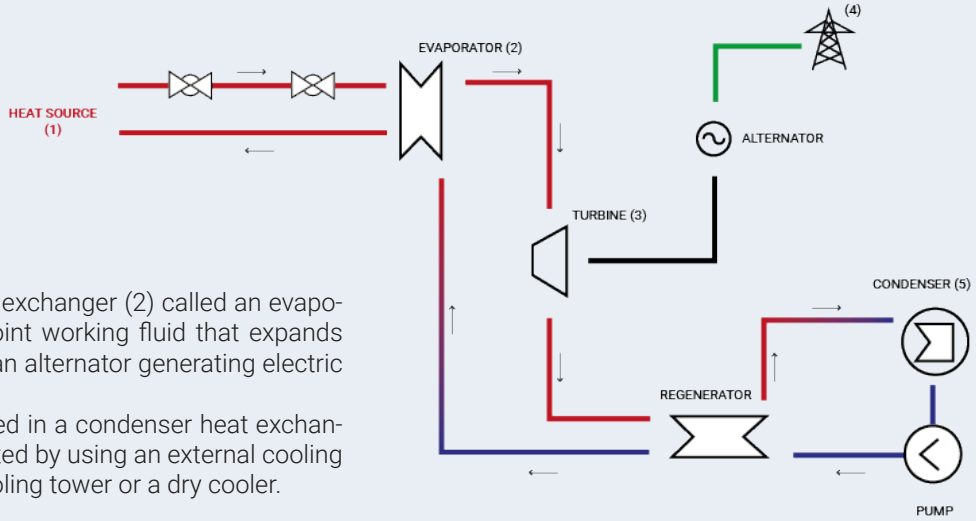
BIOMASS

INDUSTRY

ZUCCATO ENERGIA

CLEAN ELECTRICITY FROM UNUSED POWER

TECHNOLOGY



The heat (1) is conveyed to a heat exchanger (2) called an evaporator, which heats a low-boiling-point working fluid that expands spinning a turbine (3) attached to an alternator generating electric power (4).
The working fluid is then condensed in a condenser heat exchanger (5) and residual heat is dissipated by using an external cooling system such as an evaporative cooling tower or a dry cooler.

ADVANTAGES

FLEXIBILITY

We provide **custom solution** for each case study depending on the request and **need of the single client**.

AREA TEST

Permanent testing area where the plant is subjected to extensive testing and fine-tuned in operating conditions similar to those present where it will then be installed.

GREEN

Use of safe/green, non-toxic, non-flammable and ozone-friendly working fluid. No atmospheric emissions.

SYSTEM RELIABLE

Simplification of retrofitting to existing systems, making the **system reliable and allowing exceptional recovery efficiency.**

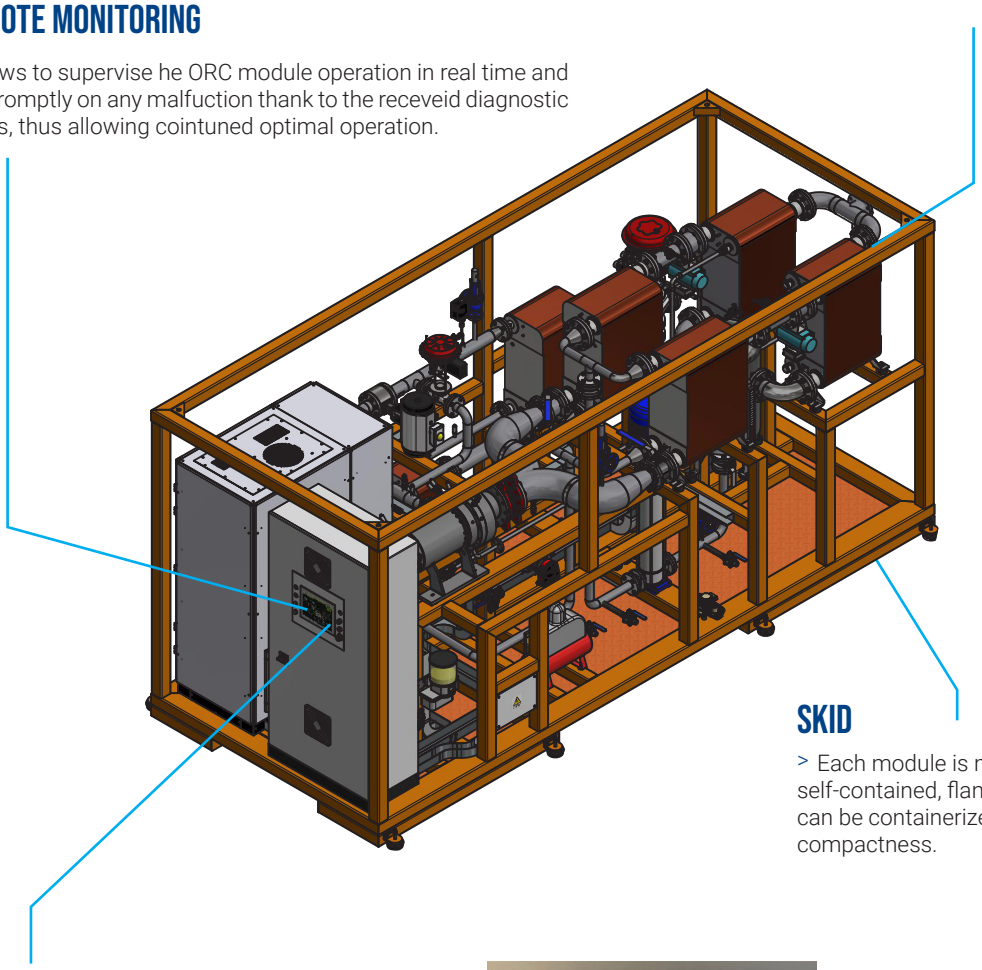
ORC SYSTEM - TECHNICAL NOTES

HEAT EXCHANGERS

> Small size, they occupy up to 10% of the space.
> They can work with minimal temperature differences between cooling fluid and cooled fluid.
> Low load losses.
> Resistance to dirt and corrosion.

REMOTE MONITORING

> Allows to supervise he ORC module operation in real time and act promptly on any malfuction thank to the receveid diagnostic codes, thus allowing cointuned optimal operation.

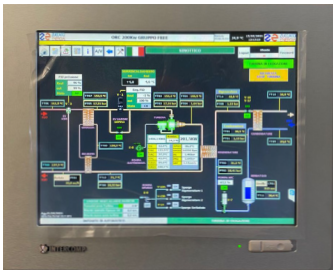


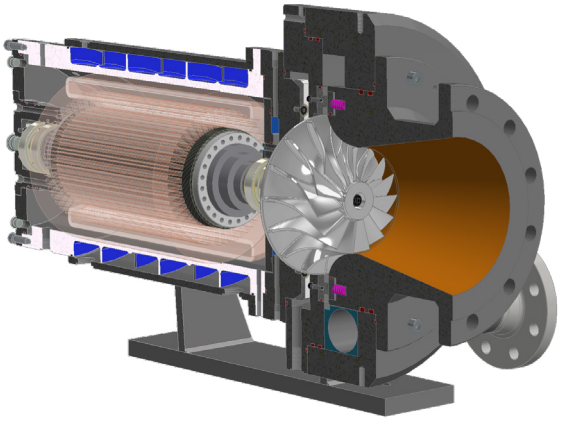
SKID

> Each module is mounted on a self-supporting, self-contained, flange-to-flange frame ("skid"), which can be containerized for maximum modularity and compactness.

CONTROL PANEL

> An integrated remote control system grants the client and technical assistance personnel full remote monitoring and management capabilities through LAN, WAN and the Web.





TURBINE

> Manufacture of full-custom turbines and modules perfectly tailored to the available thermal power and temperature specifications.
> Radial flow and efficiencies up to 16%.
> It can modulate up to 50% of the electric power produced by the machine.
> Extensive use of ceramic bearings guarantee a longer service life and maximum relaibility.

SERIES

ULH

Solution to exploit low-temperature thermal sources.

CHP

Solution versatile combined heat & power generation systems.

	ZE-30-ULH	ZE-40-ULH	ZE-50-ULH	ZE-100-ULH	ZE-105-CHP
Thermal Energy Input	350 kWt	450 kWt	550 kWt	1200 kWt	1280 kWt
Electric power output	30 kWe	40 kWe	50 kWe	100 kWe	105 kWe
System Efficiency	8.50%	8.90%	9.10%	8.30%	8.20%
Interfaces	Hot water (≥94°C)				Overheated Water (≥160°C)

LT

Solution for small-scale primary power generation.

	ZE-75-LT	ZE-100-LT	ZE-150-LT	ZE-175-LT	ZE-200-LT	ZE-250-LT	ZE-500-LT
Thermal Energy Input	550 kWt	740 kWt	1100 kWt	1280 kWt	1400 kWt	1560 kWt	2909 kWt
Electric power output	75 kWe	100 kWe	150 kWe	175 kWe	200 kWe	250 kWe	495 kWe
System Efficiency	13.60%	13.50%	13.60%	13.60%	14.30%	16.00%	17.00%
Interfaces	Pressurized, Overheated water (≥160°C)					Pressurized water (175°C)	Diathermic Oil (225°C)

SERVICES

FEASIBILITY STUDY

Study of the parameters provided and determination of suitable ORC module.

BUSINESS PLAN AND ROI

Analysis of the economic parameters profitability of the plant.

DESIGN OF THE OVERALL SYSTEM

Basic engineering, preliminary design of the extra ORC components.

MAINTENANCE

The module require only one stop per year for the scheduled maintenance.

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