



Join us in making the world a better place. Today.

**Clean Electricity from Waste Heat.  
Act Now and Remain Flexible for the Future**

Rocco Fruggi Key Account Manager Oil & Gas

**orcan**  
The Efficiency Company

# Orcan Energy at a Glance



**Orcan Energy turns waste heat into clean electricity, enabling a sustainable and profitable energy supply.**

**2008**

Founded

**95**

Employees

**170+**

International  
patents

**650+**

Modules  
marketed

**7+ million**

Operation hours

**2.0 M + t**

CO<sub>2</sub> savings

New Orcan Office Isarwinkel 14  
81379 München Germany



Our customers profit from ...

- Clean electricity at globally competitive energy prices
- For own consumption or grid feed-in.



The modular energy solutions are ...

- Compact, easy to install
- Flexible in terms of energy source and volume.



Use of standard components ensures ...

- low costs
- Minimal maintenance
- High reliability.



## Energy Efficiency

The International Energy Agency (IEA) refers to energy efficiency as the “first fuel” in clean energy transitions, since it offers some of the fastest and most cost-effective ways to reduce CO<sub>2</sub> emissions, lower energy costs, and enhance energy security.

## 750 Million Tons of CO<sub>2</sub>

By implementing waste heat recovery, we could prevent the release of 750 million tons of CO<sub>2</sub> every year — an amount that would otherwise require a forest as large as Germany to absorb.

## 67+ TWh of Electricity

The waste heat generated by all cement plants worldwide—about 67 TWh—is equivalent to the annual electricity consumption of roughly 40 million European households.

## We Make Sustainability Profitable



Save costs



Lower CO<sub>2</sub> emissions

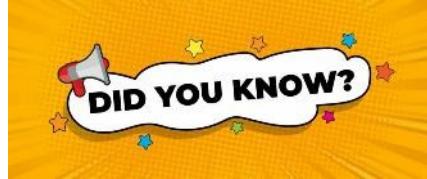


Increase efficiency

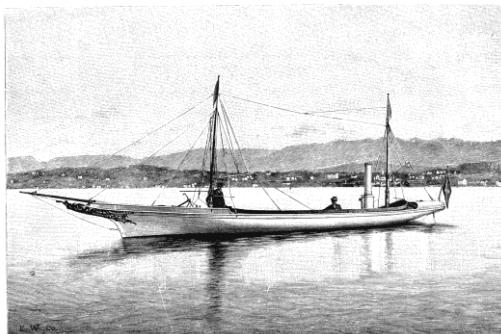
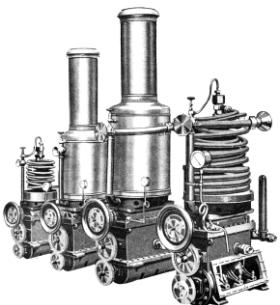
# ORGANIC RANKINE CYCLE



165 years since William Rankine, the pioneer of the thermodynamic cycle, laid the foundation for steam turbine technology



136 years since the first commercialisation



ORC

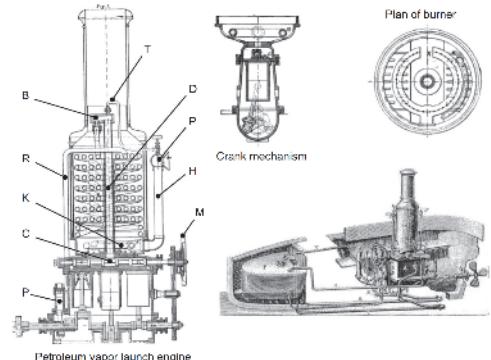


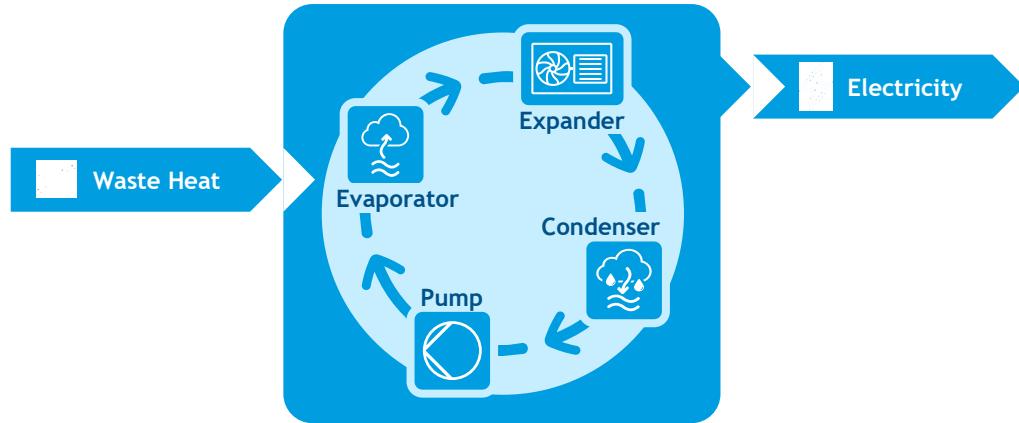
Figure 2.2 Escher Wyss – Ofeldt petrol launch, 1880.

Source: „History of Organic Rankine Cycle systems“ 2017 L.Y. Bronicki (founder of Ormat) doi:10.1016/b978-0-08-100510-1.00002-8

2700 the numbers of plants worldwide in operation.

46% increase in the last 5 years

# Second Generation ORC Technology



## Organic Rankine Cycle: The Technology in the Efficiency PACK

### Solutions



eP 100



eP 200



eP 200 Water Cooled



eP 1000

The **evaporator** transfers the waste heat into the efficiency **PACK**, vaporizing the working fluid in the process. The superheated vapor drives the **expander** and thus the generator, which produces electricity. The gaseous working medium is then liquefied in the **condenser**. The now liquid working medium is pressurized to high pressure in the **pump**. This closes the cycle and starts it all over again

### Economic

Fast revenue

### Flexible

Wide range of applications

### Robust

Proven standard components

# The heat source is irrelevant.



Glass & Ceramics



Steel & NF Metals



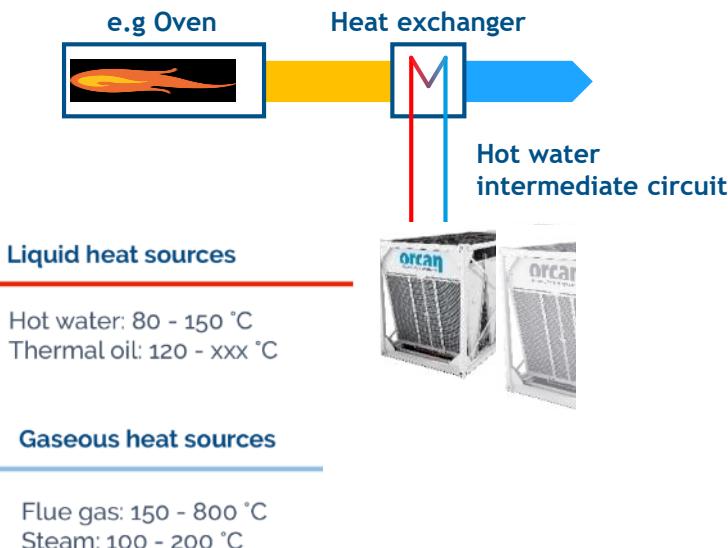
Cement



Oil & Gas



Manufacturing



Plug & Play  
containerized modules -  
scalable from 50 kW<sub>e,net</sub>  
up to several MW<sub>e,net</sub>

## Different heat sources

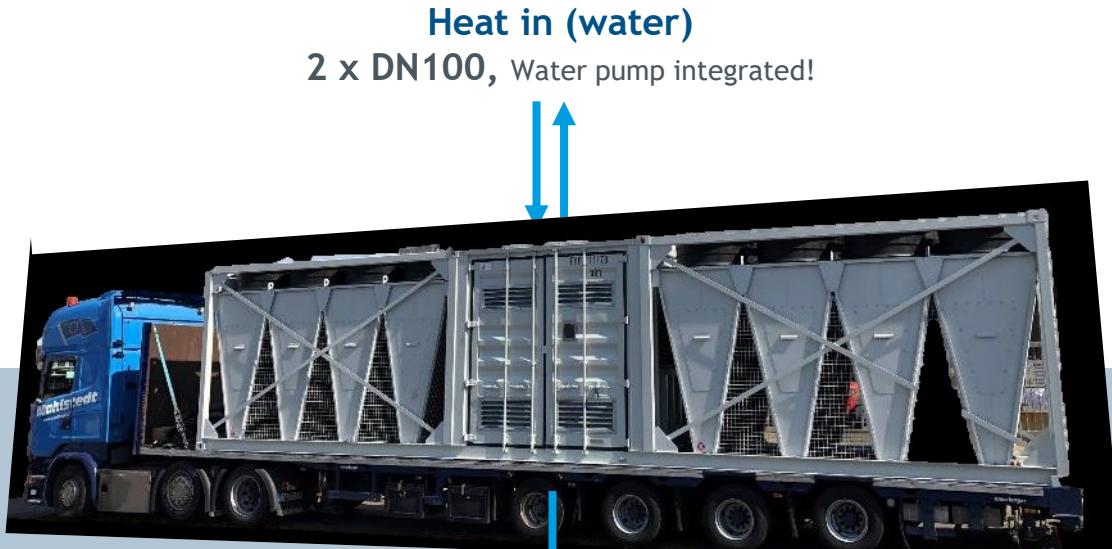
+ Adapted heat extraction

+ Fully standardized secondary loop

+ Fully standardized efficiency PACKS

= one solution

# Simple Integration: Plug and Play



**Heat in (water)**

2 x DN100, Water pump integrated!



**Electricity out**

400V, 50Hz, 3ph, Compliant to EU grid codes!

## Plug ...

- + Connection within 1 day
- + Light: 14 t
- + Integrated cooler
- + Compact 40' container

## ... and Play

- + 1 day O&M per year
- + Autonomous operation
- + No consumables
- + Non-flammable medium
- + Factory tested

# Perfect Fit for your Waste Heat



## ECONOMICAL

### Fast savings

Cash flow positive from day 1 with our financing or attractive payback periods on purchase

### Modular design

Low technical effort for plant planning and dimensioning

### Low operating costs

No consumables, autonomous operation



## FLEXIBLE

### Various waste heat sources

Usage of all types of decentralized heat sources thanks to different module sizes

### Wide temperature range

Liquid waste heat sources usable from 80 °C gaseous from 150 °C

### Excellent part load capability

Nearly constant efficiency even with fluctuating temperatures and heat quantities



## ROBUST

### Fast installation

Fast transport and easy installation in only 24 hours thanks to Plug & Play

### High utilization rate

Only 1 day of maintenance per year - spare parts quickly available thanks to standard components

### Secure operation

Stable, non-toxic and non-flammable working fluids

# Waste Heat Power Generation - Worldwide



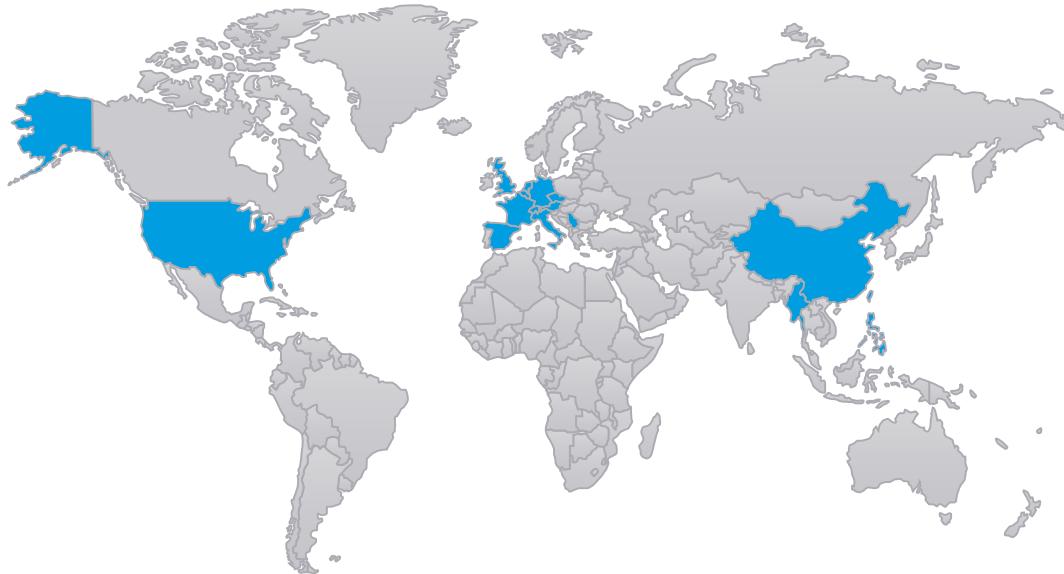
**Oil & Gas**



**Marine**



**Cement**



**7+ million**

Operation hours

**650+**

Modules marketed

**2M + t**

CO<sub>2</sub>- savings



**Steel & NF Metals**



**Engine Power Plants**



**Geothermal**

# Project Reference: Cement

**Wittekind**



# Project Reference: Metal



# World Premiere: 70 Energy Modules in One Power Plant



**70**

Energy modules  
(efficiency  
PACKs)

**100 000**

People can be  
supplied with CO<sub>2</sub>-  
free electricity

# Motor Oil Corinth Refinery Reference - Greece



**2x**  
eP 150.200  
**330**  
**kW<sub>el</sub>**

**2.8**  
**GWh**  
net electricity production  
p.a.

**>1400 t**  
**CO<sub>2</sub> p.a.**  
avoided

**Ephyra**

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# Project Reference: Geothermal Germany

**e.on**



**Fast and simple**  
decommissioning of 3 modular  
ORC units

**Transport and comissioning**  
to separete sites and  
different applications

**Flexible solution for**  
enabling cost and CO<sub>2</sub> saving  
without investment risk

# Thank You!!



  
**Rocco Fraggi**  
Sales Management | Market Research & Analysis | Revenue Generation | Sustainabilit...  
  


## Rocco Fraggi Global KAM O&G



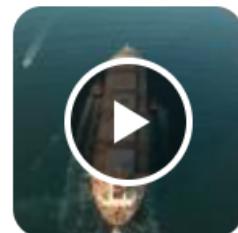
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## Orcan Energy Power Net Zero

[youtube.com](https://youtube.com)