Rising from nature!

If you desire further information about the OTEC technology, do not hesitate to contact Arteq Power by sending an e-mail to info@arteqpower.nl.

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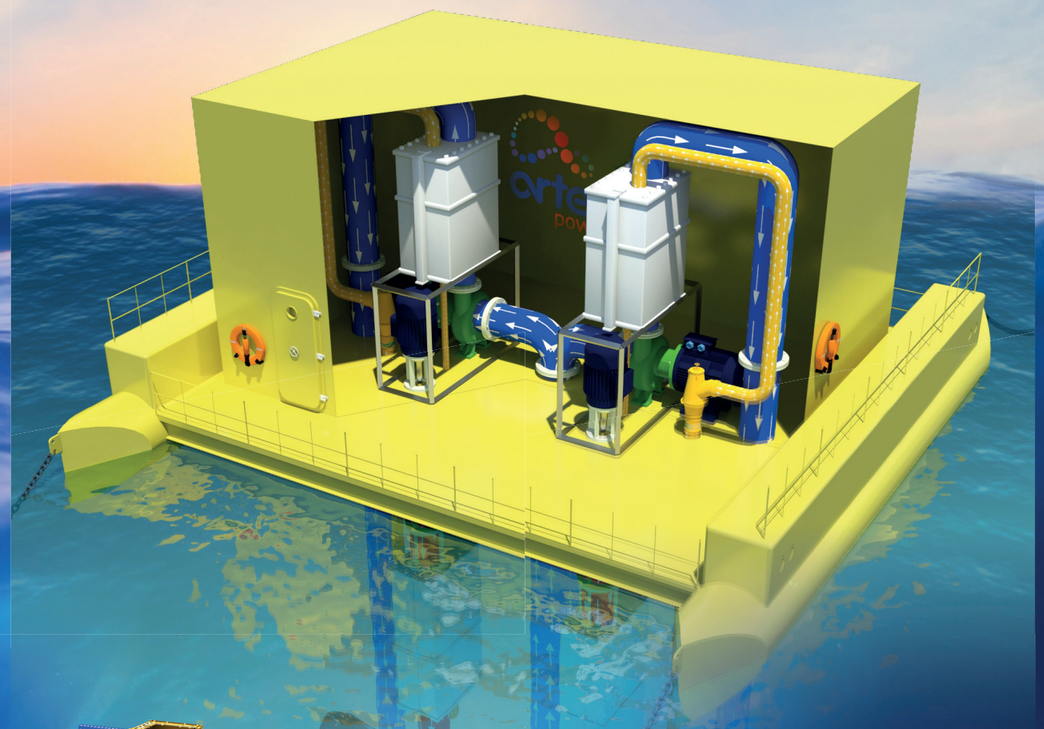
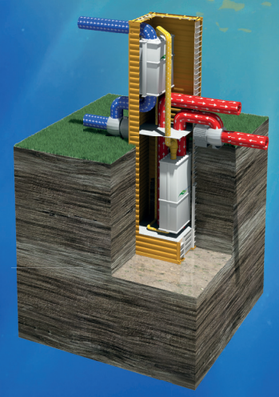
rising from nature

Gravity pump based ORC cycle
for 100~200 kW OTEC





SWAC projects for onshore application

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rising from nature

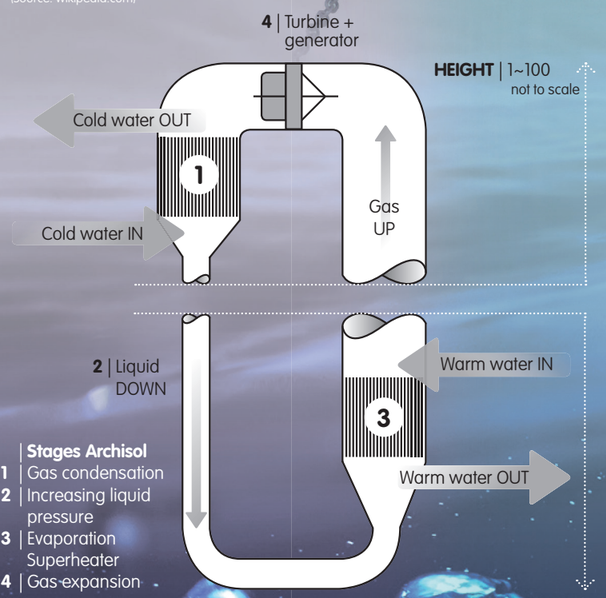
Gravity pump based ORC cycle
for 100~200 kW OTEC

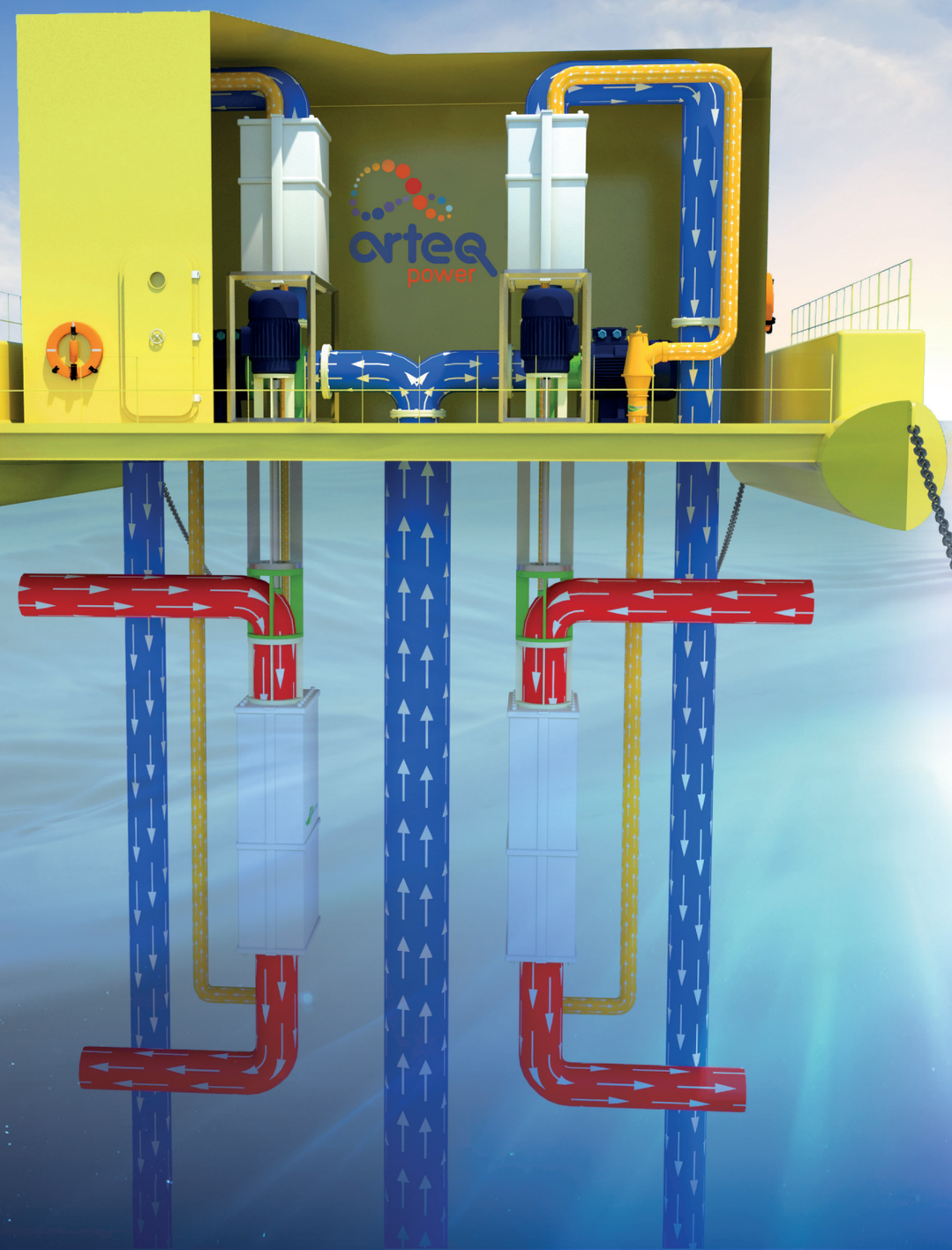
Ocean thermal energy conversion (OTEC) uses the temperature difference between cooler deep and warmer shallow or surface seawaters to run a heat engine and produce useful work, usually in the form of electricity. OTEC is a base load electricity generation system, i.e. 24hrs/day all year long. However, since the temperature differential is small, the efficiency is low, decreasing the economic feasibility of ocean thermal energy for electricity generation.

Among ocean energy sources, OTEC is one of the continuously available renewable energy resources that could contribute to base-load power supply.The resource potential for OTEC is considered to be much larger than for other ocean energy forms [World Energy Council, 2000]. Up to 88,000 TWh/yr of power could be generated from OTEC without affecting the ocean's thermal structure [Pelc and Fujita, 2002].

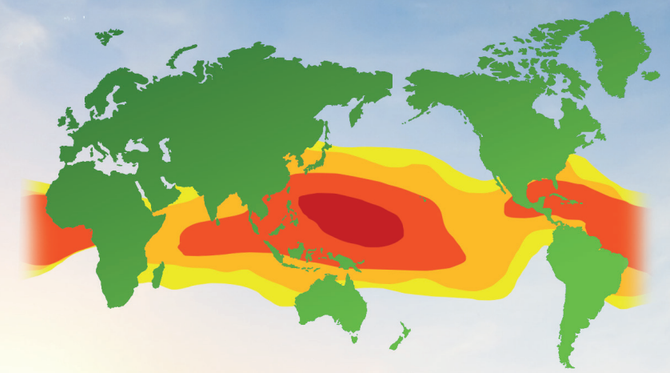
Systems may be either closed-cycle or open-cycle. Closed-cycle engines use working fluids that are typically thought of as refrigerants such as ammonia or R-134a. These fluids have low boiling points, and are therefore suitable for powering the system's generator to generate electricity. The most commonly used heat cycle for OTEC to date is the Rankine cycle using a low-pressure turbine. Open-cycle engines use vapour from the seawater itself as the working fluid.

(Source: wikipedia.com)





Archisol OTEC installation®
Emerging opportunities in equatorial regions...



Archisol OTEC installation®
an innovative approch

The Archisol OTEC installation® stands out by the basic simplicity of the cycle used. By eliminating the working fluid pump and replacing that by the force of gravity and a thermosyphon, a simplified process is realized when compared to the standard Organic Rankine Cycle. With less components, the process becomes more reliable. That in turn allows for smaller installations to be commercially viable (we expect starting from 100 kW for installations in combination with SWAC, 500 kW for stand alone installations and 1 MW for off shore installations).

The second advantage is the vertical orientation of the components: this allows for a smaller footprint, which in turn leads to lower platform costs, especially off shore.

Other advantages include relative low pressures of the working fluid (less than 10 bar), use of standard refrigerants and a temperature difference of 20 C which is expected to deliver power.

Archisol OTEC installation®
The onshore SWAC application

The principle of the Archisol OTEC installation® can also supply quantities of cold water as a by-product.
This can be used for air conditioning and refrigeration and the nutrient-rich deep ocean water can feed biological technologies. Another by-product is fresh water distilled from the sea.