



terra  water

innovative versatile
high efficiency
desalination
technology
for sea
and
brackish
water



you need water
unique water
terrwater





Quote

Water is the first principle of all things,
from which all things emerge,
and to which all things return.

Thales of Milet (approx. 625 - 547 BC),
Greek Philosopher





innovative versatile high efficiency desalination technology for sea and brackish water

affordable water to the world



Clean water is the basic requirement for mankind's existence and health. The increasing water shortages in many countries makes us aware of how elementary and precious this resource is for all life on this planet.

70% of the Earth are covered by water, however, only 2.6% of this are drinkable for people, and more than two thirds are inaccessible deep inside the Earth or tied up in the ice caps of the Earth's polar regions.

The remaining portion of the usable water for us is not just used as pure drinking water but is frequently and intensely used in private households, agriculture, and industry. This lowers the water quality, so that future cleanliness, purification, and – in view of the great water shortages in many countries of this planet - water generation will take on an ever increasing significance.

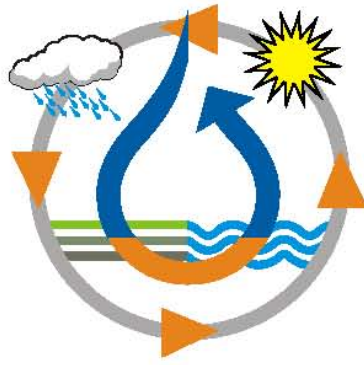
Nature shows us how to do it. A great opportunity for water production is the desalination of seawater which covers 97% of the entire water volume on this planet, thereby representing an almost unlimited resource. In the future, today's use and continued development of renewable energy sources will replace the conventional methods for drinking water generation with modern systems low in maintenance and costs.

That is the basic principle of Terrawater !

Our objective is the sustained and continuous development of innovative, multifaceted and highly efficient technologies for the production of freshwater from salt and brackish water.

Decentralized, low maintenance, economical, and environmentally friendly.





simply natural



Terrawater emulates nature and uses the natural evaporation process.

Evaporation is a physical process where water changes from its liquid state into the gaseous state (steam), at temperatures below the boiling point.

While in nature the sun provides for the heating of seawater or brackish water, Terrawater utilizes various energy resources, such as:

Renewable energies
(solar heat, geothermal heat, photovoltaic and wind power)

No additional fossil energy sources are required for this. The entire desalination process works without CO₂ emissions.

Waste heat from existing industrial processes
Advantage: Increased efficiency of the overall system.

In order to obtain an efficiency as high as possible, we continuously reduce heat losses.

The Terrawater system permits the highly efficient production of chemical and bacteria-free water at low costs.

Simply natural |





behind that curtain



Terrawater is among those thermal processes which make up well over 70% of all drinking water production facilities worldwide.

The Terrawater system works in the low temperature range of up to 95°C, achieving a GOR factor of > 3.6 by using the unique bypass technology.

At the same time we do not use any chemicals. We generate freshwater free of any salts, bacteria, or other contaminants.

Saltwater is very aggressive. Since we use non-corrosive materials only, the Terrawater system can work in a fully autonomous mode. No service personal is necessary, and the intervals between maintenance services are longer accordingly.

An optimized remote diagnostics system, and maintenance via internet and mobile phone service are available.

Draw the curtain



modularity

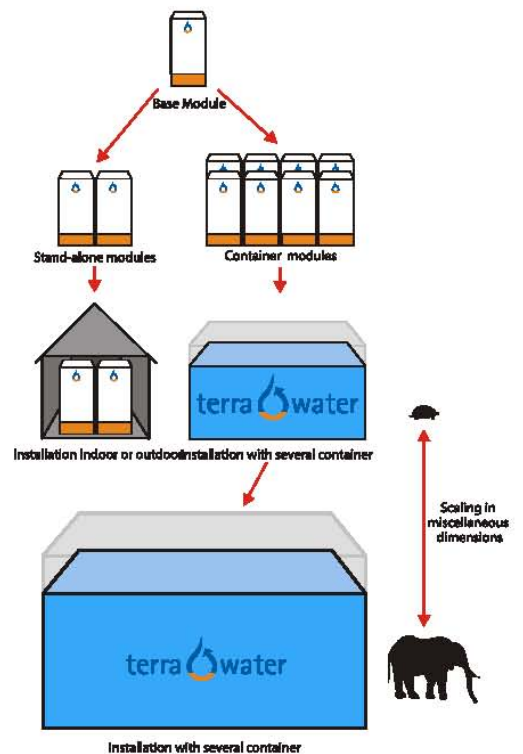


From the very beginning, modular design has been a central topic with Terrawater. Small systems run in autonomous mode can be combined into one major facility.

Depending on the heat sources available, various amounts of water can be provided for desalination purposes.

Individual desalination modules form the core of the Terrawater system which can be placed in existing buildings, or can be combined to 8 or 16 units placed inside a 20 or 40 ft. container, respectively. These mobile containers can be placed in various configurations at any place on this Earth.

Modularity at the highest level.



thermal energy sources - access to the future



The utilization of various heat sources is another highlight of the Terrawater system. Due to its high efficiency, there is nothing to prevent the use of renewable energy sources – an unbeatable benefit in times of high CO2 emissions.

Wherever waste heat is generated, a drinking water production system can be installed and operated without problems.

Renewable energy sources:

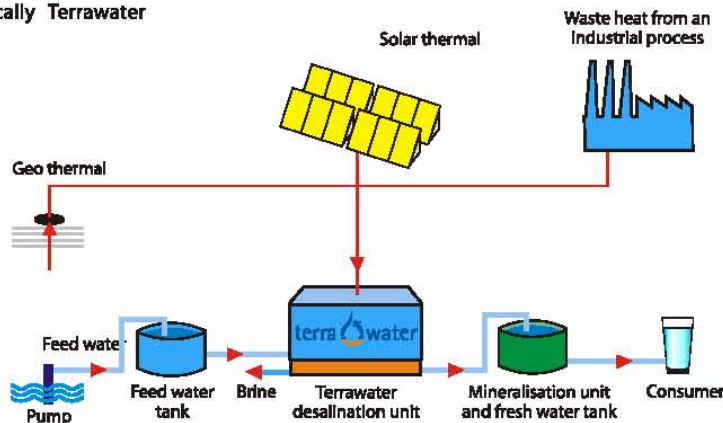
- Geothermal – heat from the Earth
- Solar heat – heat from the sun
- Biomass power plants – heat generated from flora and fauna
- and much more

Waste heat from production processes:

- CHP power plants
- Heating and cooling systems
- Electricity generators
- Garbage incinerators
- Chemical industry
- Cement, coal and asphalt industry
- Irrigation and water pumping systems
- and much more

Of course, the various heat resources can be combined in all variations.

Typically Terrawater



advantages - unique



Possible sources of raw water:

- Seawater (salinity > 100,000 ppm)
- Non-potable water
- Hot water up to 70°C (deep wells)
- River water
- Contaminated surface water

Water of highest quality

... Mineralization leads to ...

- Drinking water (WHO Standard)
- Taste optimized according to customer wishes
- Foundation for industrial applications

No chemicals

... in the entire Terrawater process

Terrawater – starting product for ...

- Households
- Food
- Industry
- Agriculture applications
- and much more

Potential heat sources

- Solar heat
- Geothermal
- Waste heat
- and much more

Safe for the environment

- No contaminated waste
- Reduced CO2 emissions

Low operating costs

- No system operator required
- No costs for chemicals
- Low maintenance costs
- High energy efficiency

optional



Mineralization

In order to safely drink the produced water, some minerals should be added to it (WHO Standard). Depending on the customer's wishes, various minerals can be added:

Standard minerals:

- Calcium: approx. 20 – 30 mg/l
- Magnesium: approx. 2 – 3 mg/l
- Other minerals upon request

This mineralization results in a water hardness of approx. 3° dH (2.3°f or 16.8 mmol/l)

Remote diagnostics

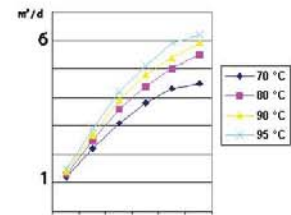
Terrawater systems can be equipped with an optional remote diagnostics system. The central office will notify the local service partner in case of an alarm.

Remote maintenance

Various operating parameters can be set by the Terrawater central office.



Cost comparison using reverse osmosis



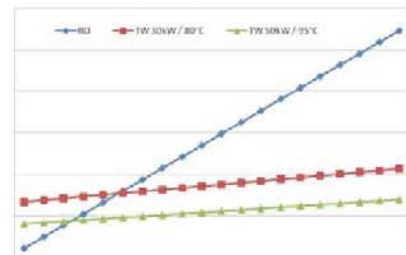
Performance data

The graph emphasizes the relationship between the thermal energy used and the temperature level of the energy carrier on the one hand, and the obtained amount of drinking water on the other hand.

Depending on temperature and energy used, a module produces between 1 and 6 m³ of purest water per day.

Cost comparison

Cost comparison over an operating period of 20 years between reverse osmosis and Terrawater through the use of no-cost waste heat. Both systems are operating at an output of 300 m³ per day.



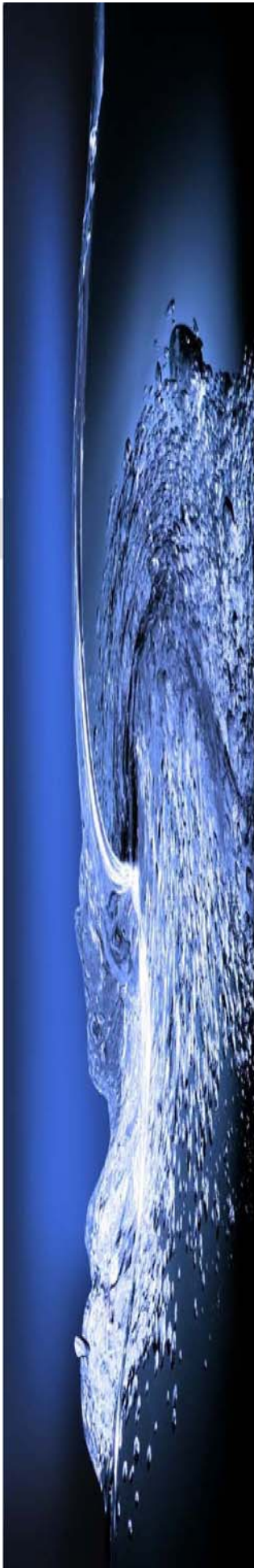
The costs of Terrawater are less than those of reverse osmosis because:

- No use of chemicals
- No continuous operator required
- No high pressure pumps in use
- No membranes to be replaced every 36 months as a minimum
- Low energy costs when operated through no-cost waste heat
- Long service intervals
- Up to 60% more economical than reverse osmosis
- Better water quality (distilled water) than reverse osmosis (conductivity <5 µS)

Price of water less than 0.1 ... 0.2 Cent / liter



you need water unique water terrawater



you need water
unique water
terrwater



terra  water  Taprogge

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