



avangreen

Sustainable solutions for water desalination and purification

Savings – Efficiency – Sustainability

AVG-SW / AVG-PW Series



Management System
ISO 9001:2008
ISO 14001:2004
www.tuv.com
ID 9105081070





- Minimum Investment cost
- Easy installation
- Minimum Operating costs
- Energy Efficiency
- Sustainability

Savings

Avangreen desalination solutions bring important savings with respect to traditional systems, resulting in a reduced cost of cost of ownership:

- Minimum Investment Cost comparing with standard desalination systems.
- Minimum Operating Cost: Maintenance cost and Operating costs reduced to a fraction of the standard.

Efficiency

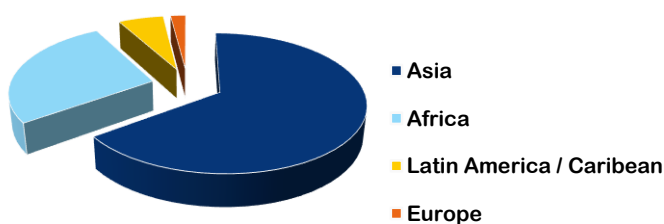
How to produce fresh water in a location with no infrastructures available (water distribution network, electric grid, etc...)?

Avangreen modular solutions do not require any infrastructure prior to their development and installation.

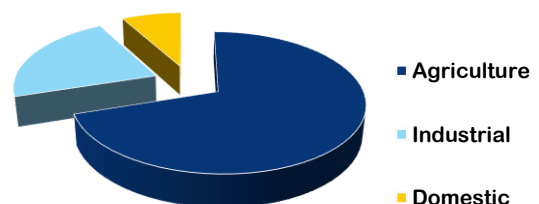
Sustainability

Minimum energy consumption and maximum autonomy due to the integration of renewable energy components

Population with no fresh water supply
Source: United Nations



Use of the Water worldwide
Source: UNESCO





Avangreen modular solutions produce up to 3.000 m³ daily. This volume is the equivalent consumption of fresh water for a 30.000 people.

Over 1.100 million people suffer from water scarcity due to lack of proper infrastructures

- Source: UNESCO

60% of the population worldwide will leave in areas with water scarcity by 2025

- Source: UN

1,8 million children die annually because of diseases originated by the lack of hygiene and fresh water

- Source: UN

Domestic Applications

Avangreen sustainable and modular desalination solutions provide with up to 3.000 cubic meters of fresh water with no need for additional energy infrastructure. This volume can satisfy the water requirements for 30.000 people.

Agricultural Use

The agricultural use is the most important one on the water cycle. For example, according to EU statistics, with the production of 1 hectare of corn it is possible to cover the food requirements of 36,5 people and this would represent a water consumption of 8.000 m³ per hectare per annum. Hence, only one Avangreen desalination solution could provide with enough water for the corn production to feed almost 5.000 people.

Industrial and Sanitation Use

Only one Avangreen desalination solution can provide fresh water for 30.000 people, fixing the main part of sanitation issues linked with the lack of fresh water.

Likewise, Avangreen solutions are especially useful for commercial and industrial applications such are hotels, factories, etc....

Main advantages of Avangreen sustainable and modular water treatment solutions:



Reduced investment costs

Avangreen desalination systems require a reduced investment as opposed to traditional desalination systems (over 50% cost reduction). Avangreen engineers tailor made solutions to take advantage of local resources and to reduce as much as possible the investments costs.



Minimum operating costs

Besides of a reduced investment cost, the operation and maintenance cost is also reduced to a fraction because of the energy cost (main operating cost). Energy is provided via renewable energy generated at the plant. Hence, no energy supply from the grid is required and therefore energy bills are reduced to zero. Likewise, Avangreen modular systems require minimum personnel to operate due to their high degree of automation and remote management.



Financing

Avangreen provides both public and private customers with financing solutions to structure the investment required, adapting the financial package to the needs and dimension of the project.



Quick and Simple

A Quicker installation and commissioning. Avangreen modular equipment is ready to operate from day one.

The plant is ready to use in few weeks after the civil engineering works.



Sustainability

The renewable energy and energy recovery systems make the system self-sufficient and 100% sustainable from an operational standpoint.

Likewise, Avangreen works in conjunction with its customers and local authorities in the management of waste and sub products to minimize environmental impact.

¿How does it work?

Desalination Process

A desalination plant includes the following main components:

- Water pre-treatment to eliminate organic and non-organic materials contained in the water. This process also helps maximizing the useful life of the membranes.
- Reverse Osmosis treatment using special membranes for each type of salty water.
- The water is then treated again to ensure compliance with the characteristics required for consumption.
- Supply of the energy required to run the pumping devices and the control equipment.

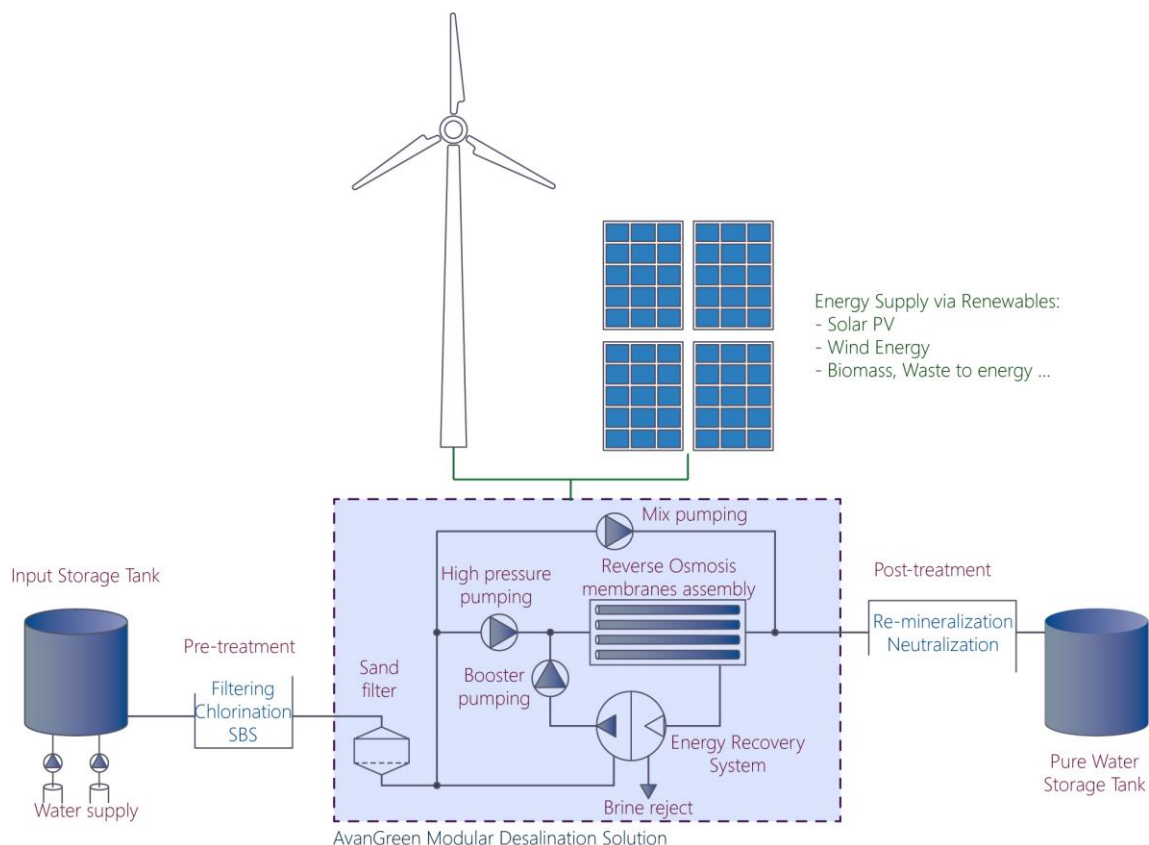
Energy

AvanGreen engineers an energy system designed to take advantage of the resources available in the environment. The system is mostly based on renewable energy sources such as solar photovoltaic, wind energy, biomass, etc...

Avangreen Desalination Module

Includes the following components:

- 5 mic. Sand Filter. Ensures that water can be processed with reverse osmosis membranes.
- High pressure pumping. It increases the pressure to force the water passing through the reverse osmosis membranes. The usual pressure is 60 bar.
- RO membranes set. Specially engineered for the type of water on scope, they reduce the salt concentration from an equivalent value of 40.000 $\mu\text{S}/\text{cm}$ to 100 $\mu\text{S}/\text{cm}$. The results are a 45% of pure water and 55% of sub product.
- Energy recovery equipment. As the sub product is rejected out of the membranes set at high pressure (50 bar), a pressure exchange device transfers this residual pressure back to the process. Hence, this is used to increase the level of pressure at the beginning of the process reducing the pumping requirements.
- Booster pump. Supplies the balance of pressure required, from the 50 bar of the energy recovery device to the 60 bar required.



Avangreen Group

Europe – Middle East – Africa – Americas

www.avangreen.com



“Water scarcity contributes to extreme poverty, generating social issues and damaging development and progress, it also generates issues in conflictive regions ... it is our common duty to grant the access to water as fundamental Human Right...”

Ban Ki-moon, United Nations Secretary General



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