

Smart Solar Desalination (SSD)

by MegaCivic, Patent Reg. No.: PD2014A000251

THE POWER OF NATURE

SEAWATER DESALINATION FOR LIFE

The world's natural hydrologic cycle is using solar energy to desalinate water. Simply pictured, the process is the following: water evaporates from oceans, lakes, rivers and land surfaces – leaving salt behind. The vapor forms clouds – rain and snow is falling down, delivering freshwater to the Earth.

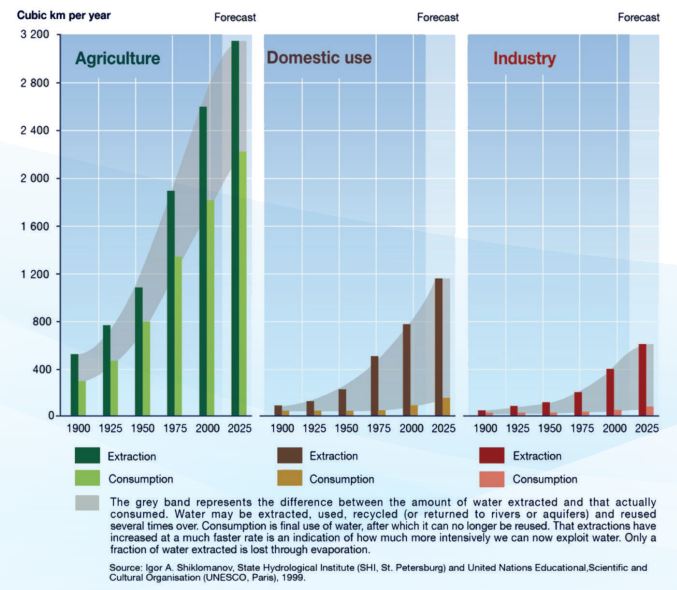
MegaCivic's Smart Solar Desalination (SSD) is based on this natural process:

- *Fresh water production for any purpose produced from sea, lake, river or brackish water;*
- *Solar Energy to avoid negative impacts on nature;*
- *Most convenient and stable costs because of lowest energy production costs per kWh thanks to the high efficient bifacial solar panels of MegaCell;*
- *long term as the glass-on-glass bifacial solar panels have a duration of > 40 years;*
- *completely bankable also due to low OPEX costs.*

A PERFECT SOLUTION FOR THE GROWING DEMAND OF FRESHWATER

SSD WORKS WHERE IT IS NEEDED

Separating salt from water is an ancient idea, salt was precious commodity. Today the sufficient access to freshwater is vital for the population, agriculture and economic development.



Islands, deserts, townships, agriculture, emerging countries, ecc – SSD helps to face the growing demand for freshwater in the most sustainable way.

SmartSolar Desalination (SSD) system has been specially designed and optimized for complete off-grid solutions - or hybrid configurations.

SSD is completely scalable, from 1.000 mc/day up to 100.000 mc/day or more.

Even in desert areas where dust and sand can create major problems the Bifacial technology works perfectly.



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THE ECONOMIC AND CONVENIENT WAY

FRESHWATER

Especially seawater desalination is an energy-intensive process: energy is the largest single variable cost for a desalination plant. The rise of energy prices has therefore a direct and important effect on the overall production costs of freshwater.

MegaCivic's Smart Solar Desalination is using high efficient bifacial solar panels produced by its sister company MegaCell. The low LCOE (Levelized Cost of Energy), or simple the low production costs per kWh, with MegaCell's bifacial technology allow

- *a far more convenient production of freshwater with 30-70% lower costs compared to Standard Desalination Systems*
- *long term stable production costs as the price for the energy does not change.*



MEGACIVIC

TURN KEY AND FINANCIAL SOLUTIONS

The turn key, tailor made Smart Solar Desalination solutions can also be delivered with a complete financial solution.

MegaCivic can provide in most of the cases

- *mid term loans covered by international operating financial institutions,*
- *medium and long term E.S.Co.-type financial solutions where MegaCivic operates the plant and the client is paying a defined price for the water consumption.*

SMART SOLAR DESALINATION

TECHNICAL KEY FEATURES

SSD Freshwater production on the basis of Reverse Osmosis (RO) is powered by High Efficient Bifacial Solar Panels.

SSD combines the best available and trustable technologies - Bifacial High Efficient PV Modules powering Reverse Osmosis technology with an optimized water storage. The overall smart technical design allows to add Genset, batteries or other hybrid power systems only if necessary and just to ensure a working back-up.

The result is a normally water purification system working in many cases 100% powered by renewable energy sources, and always minimizing the usage of diesel or other fossil fuels, as well as minimizing the need for energy storage.

SSD is optimized in order to work with BBT (BISoN Bifacial Tracker) technology.

Bifacial High Efficient Photovoltaic Modules produced by MegaCell engineered with BISoN technology and installed on a proven single-axis tracking system are the basis for a low-cost energy production - and so low costs for freshwater production.

Even in desert areas where dust and sand can create major problems the Bifacial technology works perfectly.



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SSD STRENGTH

High Efficiency Bifacial PV Modules (SSD-BBT system)

20,4% front efficiency, 25,5% total efficiency with 30% rear PV modules side contribution and lower LCOE

Efficient also for investment

Thanks to the low costs per kWh SSD offers surprisingly short payback times and makes complete financial solutions possible.

Energy costs sharply reduced

The costs for energy or the energy delivered for the depuration process of water are reduced up to 87% in comparison of plants working with fossile energy sourced.

International Patent Pending system designed by dedicated and experienced R&D engineering team

International Patent registration filed at the Padova (Italy) Chamber of Commerce - Reg. No.: PD2014A000251

Modular system

From 500 mc/day of fresh water to 100.000 mc/day or more.

Made In Italy

Engineered and produced in Italy.

Long lifetime duration

Due to high quality products the lifetime of a SSD plant is far longer than for traditional RO plants.

Water storage

HIGH VOLUMES

The smart design of SSD allows that solar energy is used immediately for the desalination process, it has not to be stored in expensive batteries.

The water tanks have a double scope: to optimize the energy production process and to guarantee the availability of water.

Batteries and Back-Up Systems are only used to ensure that the Reverse Osmosis system is maintained well as the membranes needs to be watered at any time.



BUSINESS MODEL: FLEXIBLE AND CUSTOMER ORIENTED

TURNKEY & TAILORMADE

MegaCivic offers complete SSD turnkey solutions:

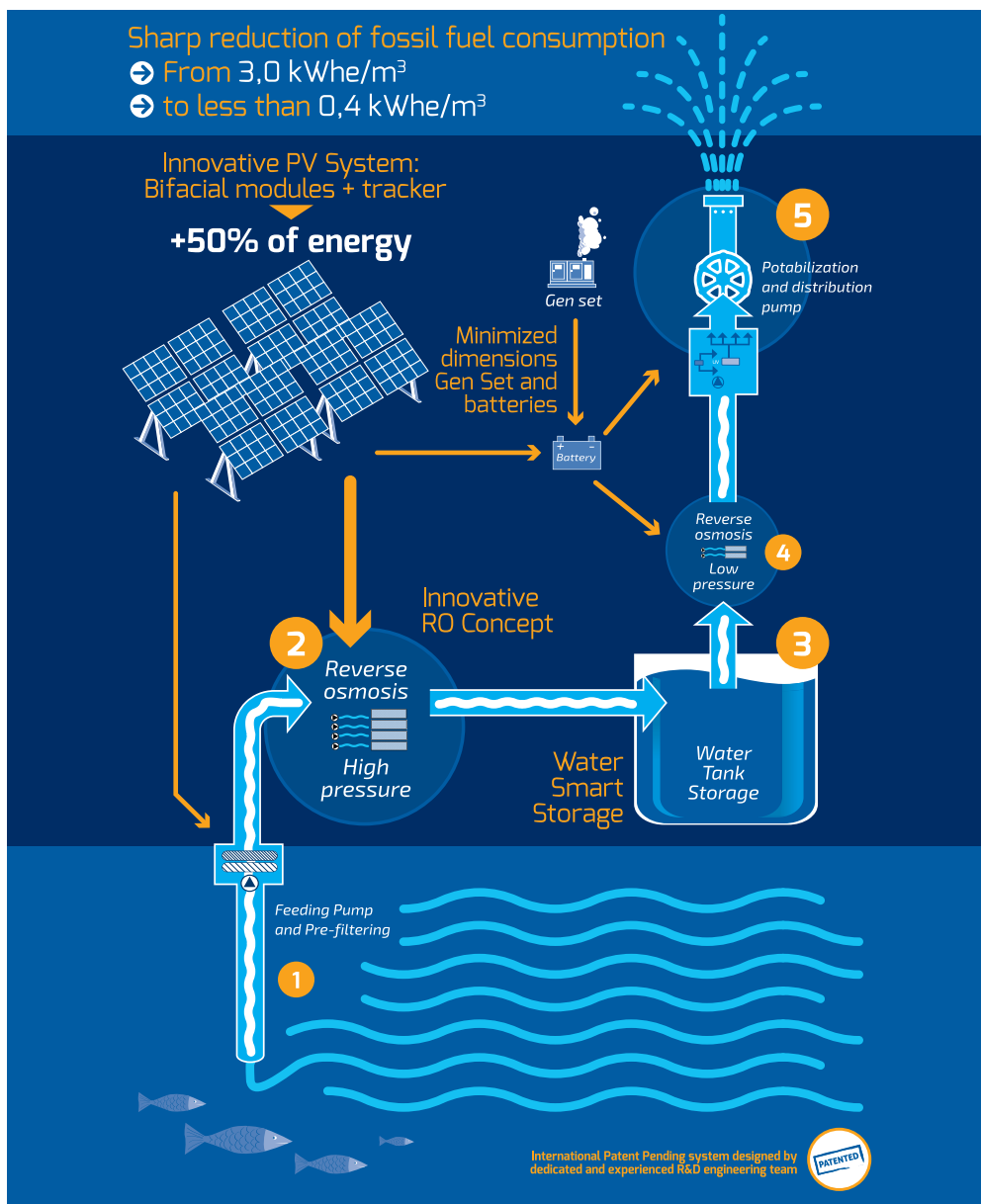
- *Tailor-made design according to the customer's needs and local resources (e.g. water, sun hours, ecc)*
- *All kind of water can be produced: for civil, agricultural or industrial use, demineralized water, ultra pure water, ecc*
- *All kind of water sources can be used for SSD: sea, river, brackish water, ecc*
- *Turn key construction as well as O&M (including centralized or local remote monitoring)*
- *Training packages for local partners*



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PV-SMART RO (SSD - SMART SOLAR DESALINATION) PROCESS



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