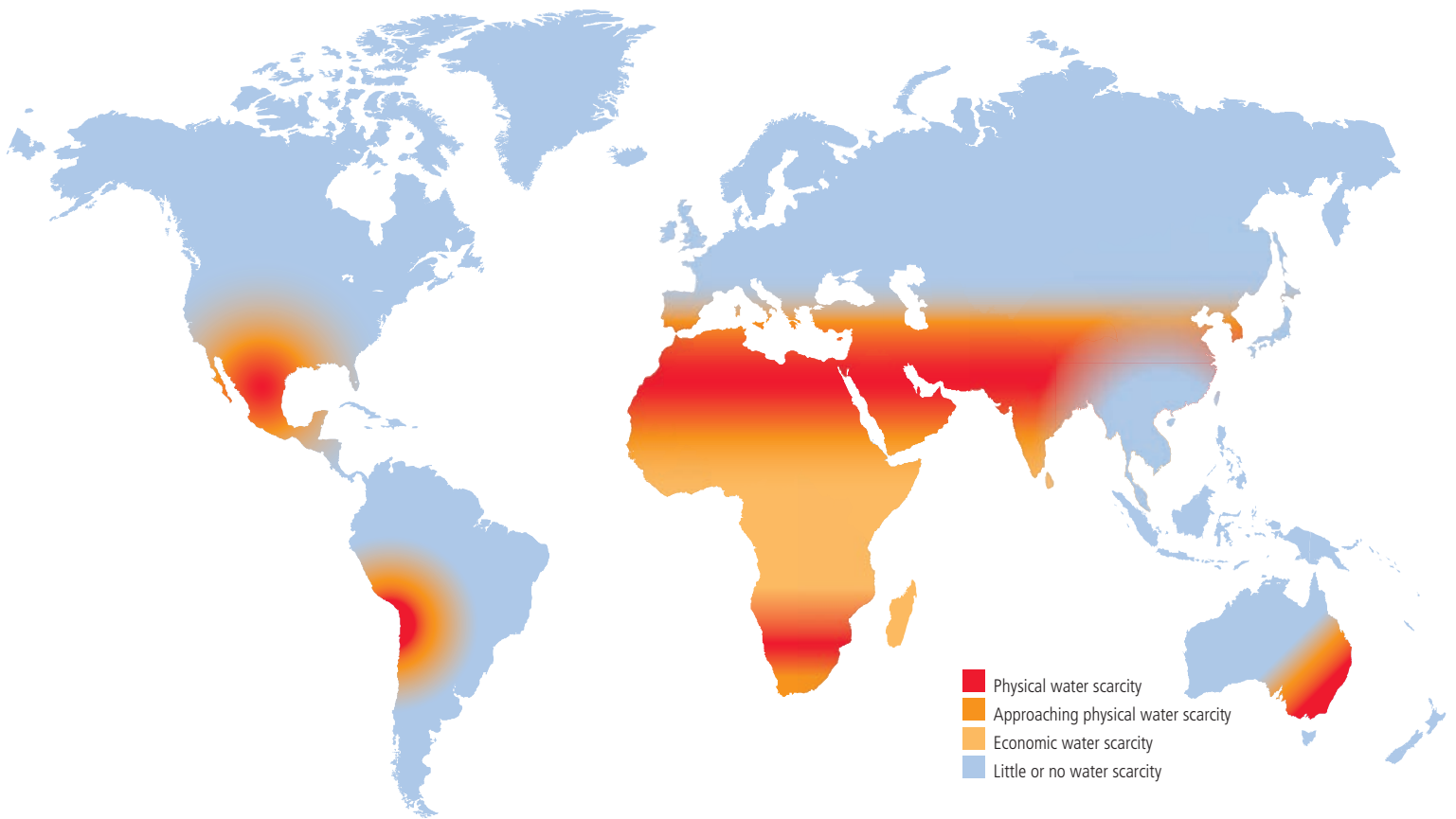




Pure, clean
and 100% green

KRYSTALLTM  **SWISS
INSO**
solar water purification



The natural solution to a global challenge

People living in most dry geographies and water-deficient regions have limited or no direct access to healthy drinking water and suffer drastic restrictions in their supply of clean water. It is estimated that two-thirds of the world's population has no direct access to clean, healthy water.

For communities across Africa, Asia, Australasia, South America and Southern Europe, this issue causes severe hardship. In the world's poorest countries, where high fuel costs and lack of infrastructure make conventional solutions impossible, it threatens economic growth, damages the environment and is responsible for widespread disease and premature death.

Lack of access to clean water is a problem that worsens daily. With populations growing, demand for drinking water is doubling every year in Asia and Africa. In India alone, approximately 650,000m³ of additional drinkable water will be required by 2015.

Governments, local communities and NGOs are under pressure to put projects in place to overcome water supply shortages. But conventional solutions, which rely heavily on fuel or electricity, not only increase CO₂ emissions, but are limited in scope and reach as many affected regions have no access to reliable sources of energy. This means these solutions cannot be implemented in the poorest and most remote communities that are in the greatest need of relief.

But with today's solar power technology, there is a natural, viable alternative. Capitalizing on the high levels of solar radiation in hot, dry climates, SwissINSO has developed a solar-powered water purification system that works autonomously and independently of external fuel sources, harnessing the sun's power to fulfil the most basic human need.

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The proportion of the world's population expected to be living under water-stressed conditions by 2025.



Krystall™ from SwissINSO

Air-conditioned container

Key benefits

- Autonomous, robust, high quality and long-lasting
- Works independently of conventional energy sources
- Totally green solution
- Can be installed in remote locations
- High water output – from 50m³ to 200m³ per day, depending on water source
- Low running costs compared to non-solar units
- Payback of total investment in under 3 years
- No permanent infrastructure needed
- Simplified pre-treatment phase limited to a cartridge filter
- No clogging or fouling due to steady flow through the entire process
- Top Swiss quality equipment using best in class components

The Krystall unit

The Krystall water purification system consists of two 40-foot containers, which are placed side-by-side, about eight metres apart. One container houses the reverse osmosis (RO) water filtration skid and desalination equipment, along with the battery racks that store solar energy, providing a back-up energy source, and ensuring that the supply of clean, healthy water is uninterrupted. Purified water is stored in a storage tank housed in the second container along with the solar panel control system.

The array of high efficiency photovoltaic panels are installed on an easy-to-mount, fully-galvanized steel framework covering the two containers and supported by steel posts at the four corners. These panels supply all the energy needed to power the Krystall unit. The full system is a complete turnkey solution with all elements and components integrated and supplied.

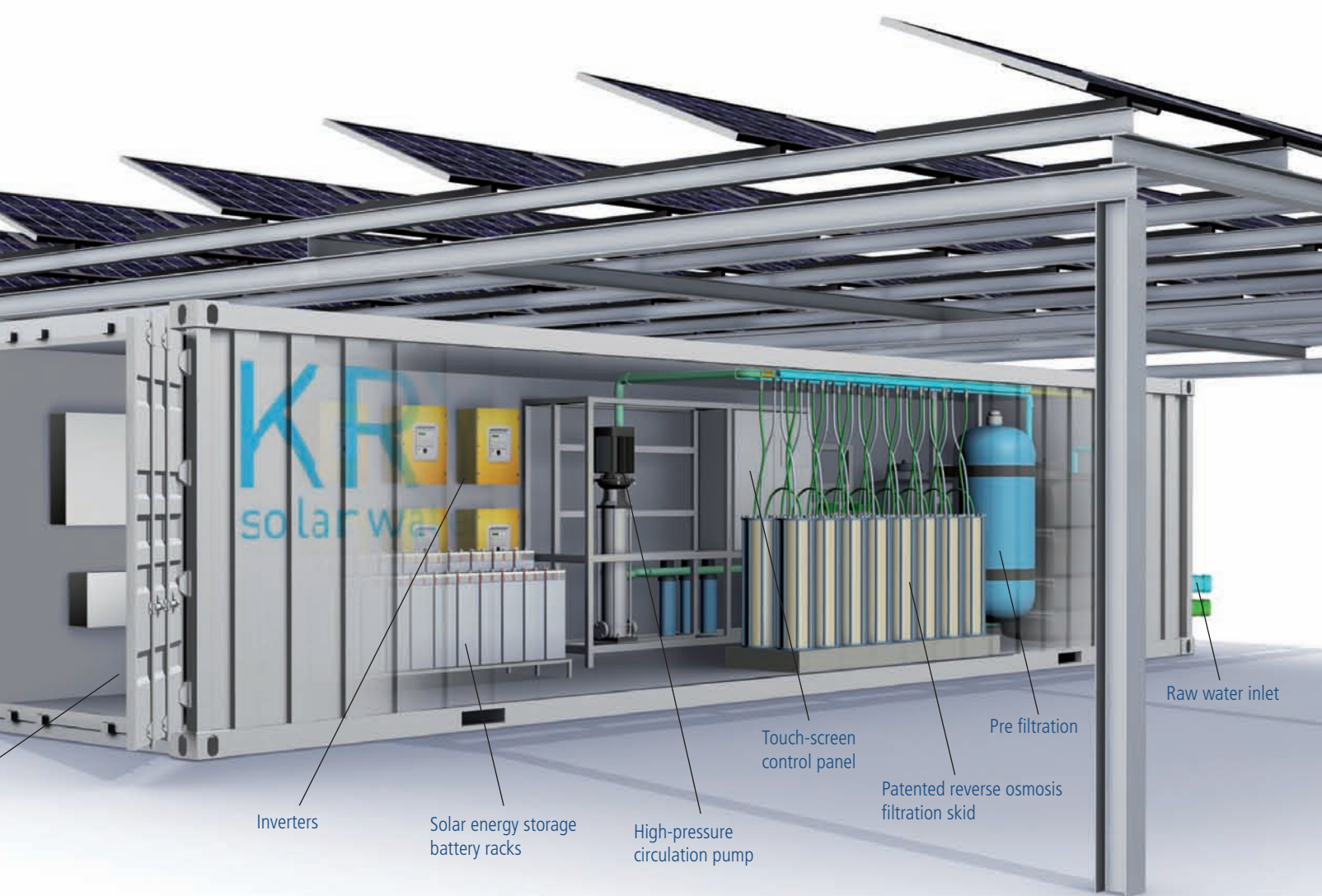
As a further option, a solar powered bottling line can be added to the Krystall unit or operated independently.

The Krystall process

Once raw water – from the sea or brackish sources – is pumped into the Krystall system, the unit's solar-powered pumps and compressor begin their work. First an automatic self-cleaning pre filter removes all solid particles and debris; then filtration by reverse osmosis membranes removes all suspended solids, turbidity, viruses, bacteria and most organic compounds.

Based on patented membrane technology developed by SwissINSO's partner MFT, the system forces water through a series of circular membrane plates in two separated streams in a way that effectively minimises pressure on the pumps and membranes. It therefore requires less energy than any other system, allowing the unit to operate solely using solar power.

As a consequence, yearly running costs for Krystall units are considerably lower than standard units – estimated at 45 % less than grid powered and 70 % less than diesel fuel powered systems.



Production

| Krystall Products | Source Water | Daily output | Yearly output |
|-------------------|----------------------|--------------|-----------------------|
| Krystall SA50 | Sea water | 50,000 l | 18,000 m ³ |
| Krystall BR50 | Brackish water | 50,000 l | 18,000 m ³ |
| Krystall BR100 | Brackish water | 100,000 l | 36,000 m ³ |
| Krystall UF100 | Spoilt surface water | 100,000 l | 36,000 m ³ |
| Krystall UF200 | Spoilt surface water | 200,000 l | 72,000 m ³ |

Technical Specifications

| | |
|---|--|
| Water temperature range: | 10 – 40 °C |
| Guaranteed permeate quality: | 300-400 ppm (compliant with WHO regulations) |
| Minimum life expectancy of membranes: | 5 years |
| Power source: | photovoltaic energy |
| Photovoltaic panel size: | L = 1599 mm ; W = 1046 mm ; D = 35 mm |
| Efficiency per square metre: | 190 W |
| Energy per panel: | 305 W |
| Minimum life expectancy of photovoltaic panels at 80 % P _{mp} min: | 25 years |
| Certification: | IEC 61215 ed 2 (from -40°C to 85°C) |
| Solar electricity storage: | 2000 Ah 96V (lead batteries*) |

* Average life expectancy of 10 years, recycling and related costs handled by SwissINSO



Up to 100,000 litres a day... anywhere on earth

Energy from the sun's rays... water from the sea or earth... SwissINSO has developed a sustainable system that works in tandem with the world's natural resources to deliver up to 100,000 litres of clean water daily, wherever they are needed.

Utilizing patented reverse osmosis membrane technology and state of the art photovoltaic panels, SwissINSO's Krystall system provides the world's first truly green, cost-effective solution to drinking water shortages. Manufactured and assembled in Switzerland, the self-contained units are easily transported in standard containers in which they are ready to operate.

The Krystall water purification unit is unique for two reasons: it operates independently of any external power supply and it produces very high volumes of pure drinking water.

Powered solely by solar energy, it is completely self-sufficient, and can therefore be used in even the most remote locations. Every day, each unit can transform up to 100,000 litres of brackish water, 200'000 litres of contaminated water, or 50'000 litres of salt water, into pure drinking water, meeting all international (WHO) standards.

End-user applications / market segments

- Government agencies and non-government organizations
- Local communities
- Humanitarian relief organizations and foundations
- First aid organizations
- Hotels and resorts
- Islands
- Military
- Industries (bottling companies, foods, pharmaceuticals, etc.)





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