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# Atmospheric Water

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# Water : Life Source

Water is sacred and **essential to Life.**

Despite being recognised as a **fundamental right** by United Nations, access to drinking water is not guaranteed, which has severe consequences on some communities : famine, bad irrigation of crops and soil, impact on wildlife and flora, health risks...

What we offer : a water source

**PURE, INFINITE** and  
**AUTONOMOUS**

# Blue gold

## Stress hydrique : un quart de l'humanité concerné

**1/3** of the world's population still remains with no access to safe drinking water facilities (2017)

- Report WHO and UNICEF -

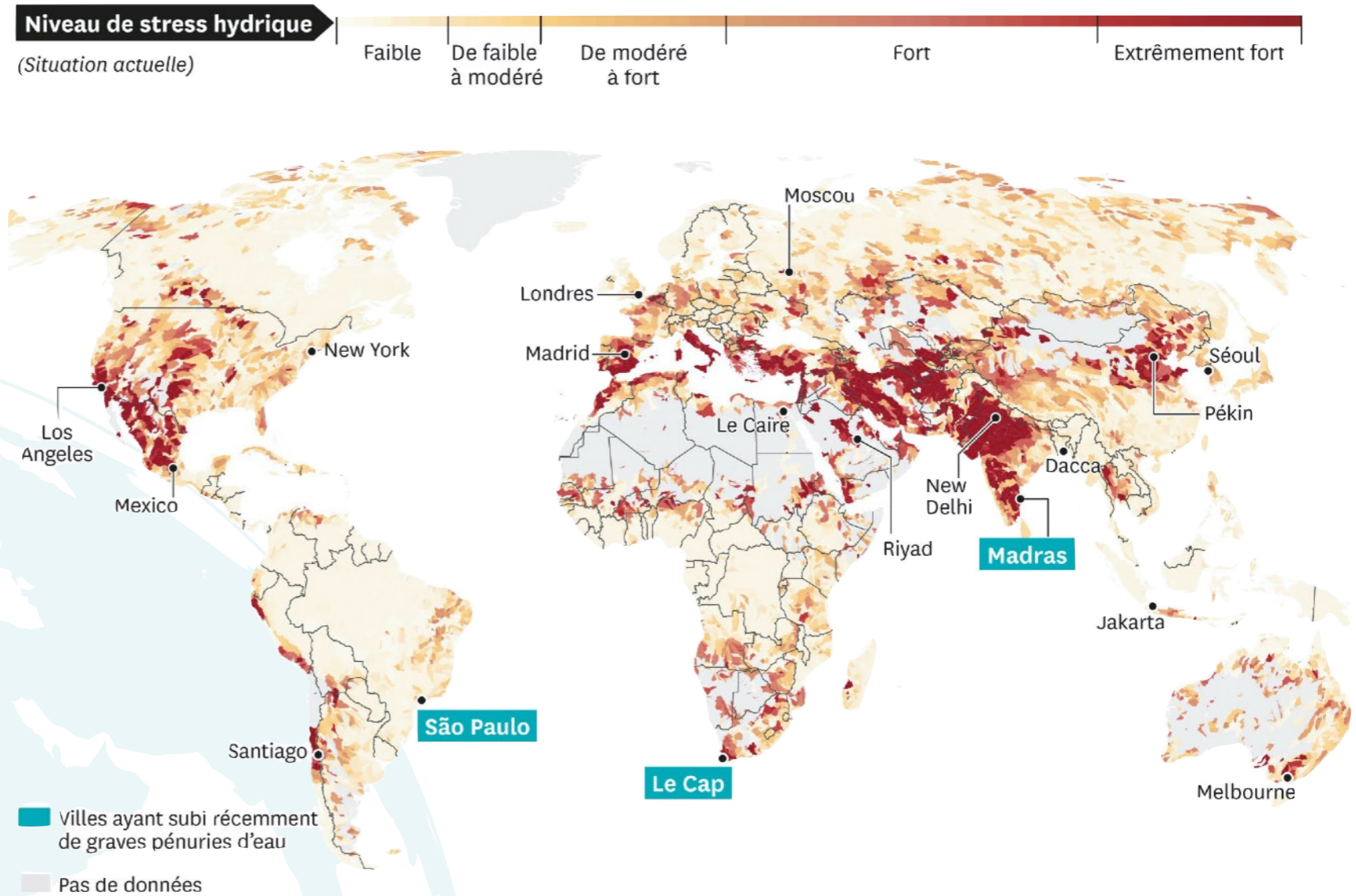
**5** people in the world die every minute due to the lack of access to safe drinking water

- National Geographic -

Because of **water shortages** happening everywhere in the world, water has become like "**blue gold**".

Arid countries are hit the hardest : *"too many overuse groundwater wells instead of letting them replenish and save water for the driest periods."*

Based on data from the World Meteorological Organisation (WMO), 2019 was **the second warmest year since 2016.**



SOURCES : WORLD RESOURCES INSTITUTE, WEIYI CAI/THE NEW YORK TIMES

# A resource at risk

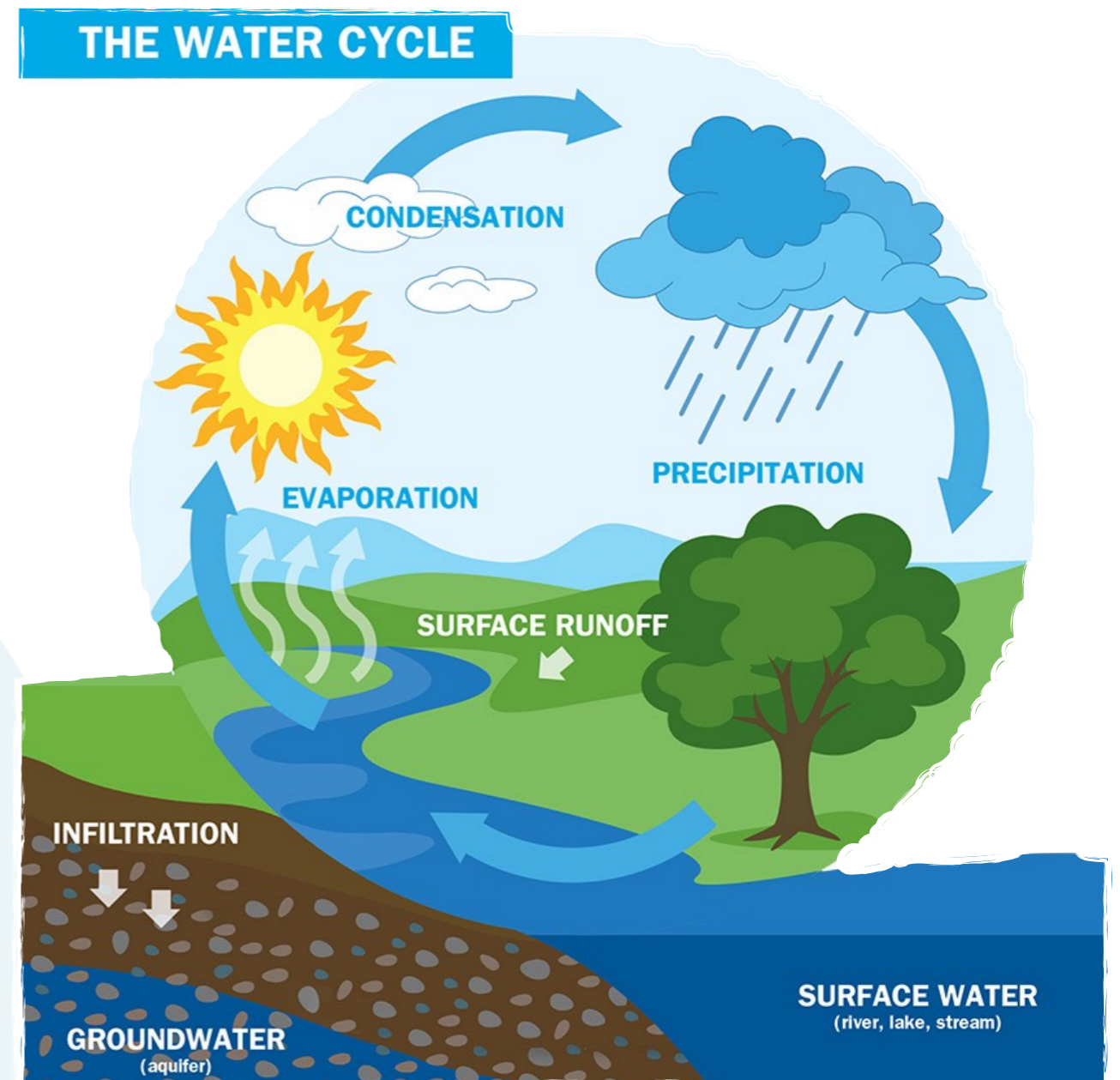
Main fresh water sources are being **over-exploited** by the various dams, wells, water withdrawals and pumping stations that have dramatic repercussions :

- \* **Aggression** on soils
- \* Sanitary treatments leaving **chemical residues**
- \* **Accumulation of salt waste (brine)** due to the desalination, impacting wildlife and flora.

Average daily consumption of water per person :

Between **100** and **350** liters a day in affluent regions

Between **70** liters and **no water at all** in the poorest regions, resulting in health threats, famine and sometimes armed conflicts.



# Water vapor

Atmospheric water consists in **converting humidity in the air into water in a natural way, thanks to condensation.**

This is a natural phenomenon seen ever day with fogging over a window or morning dew.

Atmosphere contains dry air ( $5 \cdot 10^{15}$  tons) and water vapor ( $18 \cdot 10^{12}$  tons). This water vapor comes from evaporation from oceans and streams or from evapotranspiration from plants. The quantity of vapor contained in moist air is called **absolute humidity** (grams of water vapor per air cubic meter).

Air temperature (°C)	Absolute humidity (g/m <sup>3</sup> air)
30	30,08
20	17,15
10	9,36



# Our solution

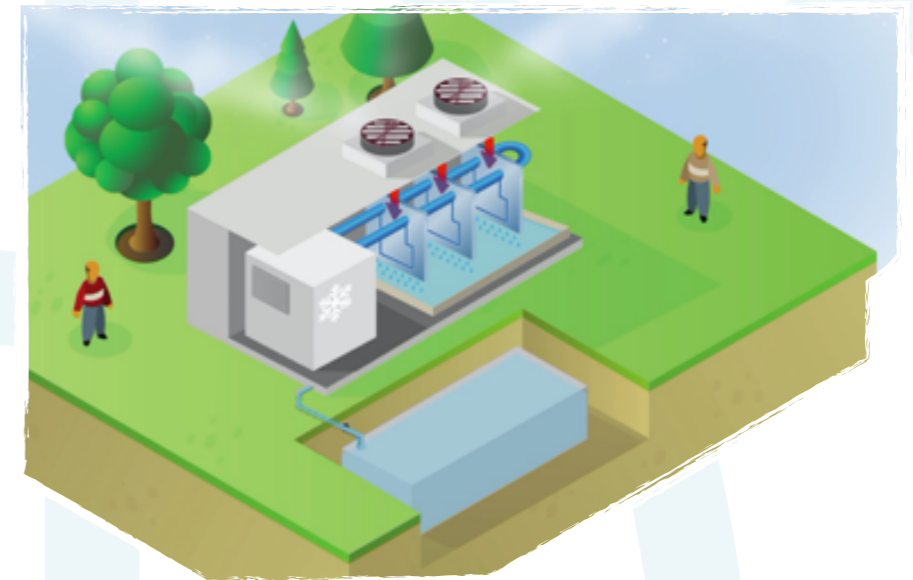
It is the **only patented system of its kind in the world** and its power comes from its **energy compression capacities**.

Energy compression is obtained through the extreme **optimisation** of the system's functional parts (condenser, cooling generator, regulator...), whose parameters are automated.

Energy consumption varies between **100 and 30 Watts** per litre (compared to 400 to 800 Watts for existing systems) ... a **significant difference** compared to current standards.

Capacities in freshwater production start at **3000 litres** per day and can go up to **unlimited volumes** when adding extra components.

The quantity of water produced depends on the volume of treated air, temperature and air **hygrometry**. Depending on the temperature and hygrometry, our system can recover **5 to 30 grams of water per m<sup>3</sup> of air**.



# Advantages

Surrounding air is absorbed and cooled down just under dew point temperature, using humidity to **produce water**. Water is then collected and **ready to be used and consumed**. Romans already used this technology, we simply improved it.

## Economical and ecological advantages of our solution :



Air is inexhaustible, renewable and omnipresent



It is 100% sustainable, does not contaminate and does not damage natural resources



It produces pure natural drinking water, with a low chemical load



It is autonomous, compact and water is consumable in the same place it is produced.



It is economically and easily compatible with other chemical treatments and mineral supplements



# Usage

Its **low energy consumption** allows our system to potentially be implemented anywhere because :

- It produces **water autonomy** (factories, housing, hospital, schools, stations, jails, businesses, islands, hotels, isolated areas...);
- It allows **strategic water reserves** to maintain healthy levels (dams, wells, water tanks...), as these are essential in case of exceptional circumstances (fires, drought...)



- It enables **water supply** of makeshift camps, refugee or disaster-stricken camps **in just a few hours;**

It is a **modern, alternative and economical method** that **respects the environment.**

It can be used in **all temperate or tropical regions** in the world, under "normal" temperature and humidity conditions.

This new technology allows **Accessibility, Autonomy and Abundance**



On your right you may find **an example of daily water production (in litres) based on a Aquatéthys unit (50m<sup>3</sup>/h), subject to temperature and humidity conditions.**

## The Shell

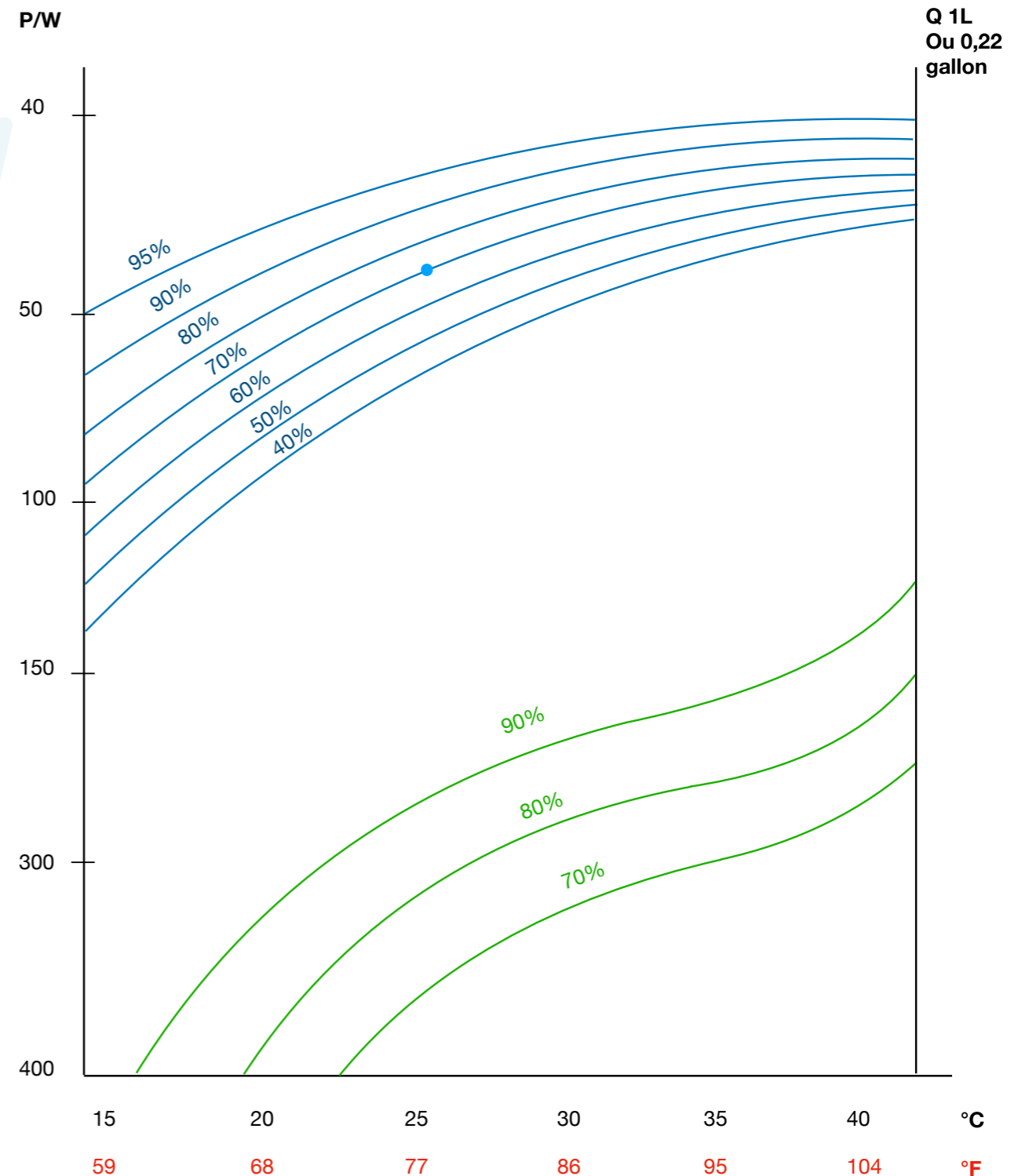
We have selected "one trip" **containers** (20 or 40 feet) which are in good conditions and don't have too many bumps. These will be **easy to paint with your own colours** and we have contacted a marine paint

producer for convenience. The containers will enable our units to be **mobile, easily transportable and allows for quick delivery around the world.**

Therefore, our autonomous solution reduces **high budget investments** in production infrastructures, warehousing or transport.



### Production d'eau atmosphérique en fonction de la température et de l'hydrométrie ambiante



Production eau atmosphérique

Production eau atmosphérique procédé classique

Point de référence 25°C / 70% d'humidité



# Cooling system

Our technology allows us to produce atmospheric water with various energy sources :

## ELECTRIC, GAS AND SOLAR

Small electrical capacities will be equipped with refrigeration units that use classic **Scroll compressors**. Bigger electrical capacities will be equipped with cooling generators that use the latest **screw compressors**. Gas based productions use **absorbing** technology.

We use **Eurovent or AHRI certified** generators of **standard performance**. Our generators use **little refrigerant gas** and the latter is specifically contained.

## Evaporators

We have **3 sizes of heat exchangers** : a large size for large capacities, an average size for capacities of 5000 litres, and a small one for autonomous units (approximately 3000 litres).

Implementation plans are part of our intellectual property, since the assessment of locations, turbulence, air speed and exchange surfaces comes from our research office.



## Control and protection boxes

The electrical cabinet will protect the components as well as the on-board automation system, the latter being an extremely sophisticated tool, the production will adapt to weather conditions, temperatures, hygrometry and atmospheric pollution.

Therefore, the cabinet will host powerful computers as well as all the tools related to compensation and variable speed for all the components included in the control box. It will also include **on-board or remote supervision**.



## Water treatment

Atmospheric water is **neutral and demineralised**. Before being stored, water will be treated in order to purify it and add minerals to it. Treatment will include a UV lamp, filters and re-mineralising cartridges so as to **produce a water that conforms with the client's needs**.

## Mounting and trials

The selected components are pre-built; other necessary linking components as well as the mounting time are limited. As a result, little manpower and **no specific skills set are required**.

An **automatic testing program** will be made available and will enable the control of units, towards the end of the assembly line, but it will also enable **remote self-diagnosis**.

# Practical information

## Services

When using this production unit for consumption, **the safety of the produced drinking water is guaranteed at all times**, even above performance standards related to sanitary requirements. For production needs beyond 50m<sup>3</sup>/day (50,000 litres), an on-site research study is necessary. Our technology is designed and meant to work **based on the available energy network**. Our system Plug & Play enables production to start within **less than 30 minutes after installation**. Thanks to the **low energy consumption** of our method, other eco-friendly alternatives can be installed (solar panels, windmills, thermal power, petroleum, gas...) and render **water production 100% autonomous**.



## Maintenance et télémaintenance

The whole of the system is **watched and controlled remotely**. Subscription to a complete remote surveillance and maintenance is necessary, as it ensures **control of the water production**, implementation of guarantees, updating of the softwares and alarm triggers (ie. filter changing requirements etc.).

## Tailor-made project

***Our research and development team strives to continuously improve our technology's performance.***

Our customised studies **depend on local parameters** that may vary greatly from one part of the world to another : location, weather, hygrometry, land adaptation, usage, volume etc. **This is why a questionnaire was especially designed to optimise each specification and deliver the best solution.**

# Contact

Please feel free to contact us if you need further information



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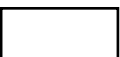
# Tableau des productions et des capacités de production pour

## Table of production and production capacity for

Humidity % Temperature (°C or °F)	30	40	50	60	70	80	90
40°C / 104°F							
35°C / 95°F							
30°C / 86°F							
25°C / 77°F	3200 L	4000					
20°C / 68°F	2400	3200	4000				
15°C / 59°F	1800	2400	3200	3200			
10°C / 50°F		1800	2000	2100	3000	3100	

 La production a une consommation comprise entre 50 et 100 W du litre et peut être supérieure à la capacité initiale de la machine (5 à 8000 liter/jour)  
The production consumption is from 50 to 100W per liter and can be higher than the initial capacity of the machine (5 to 8000 liter/day – 1100 to 1760 Galon)

 La production a une consommation comprise entre 100 et 180 w du litre  
The production has a consumption between 100 and 180 w per liter (per 0.22 gallon)

 La production initiale d'eau n'est plus assurée, la consommation reste comprise entre 150 et 300W /litre  
The initial production of water is no longer ensured, consumption remains between 150 and 300W per liter (per 0.22 Galon)

Les débits d'air et les débits de gaz frigorigène étant progressifs, la régulation qui équipe nos machines peut s'adapter à la demande du client suivant son utilisation et suivant son implantation, nous avons plusieurs axes et plusieurs leviers selon les impératifs du client selon qu'il privilégie la production d'eau ou la consommation.

The air and refrigerant gas flow rates being progressive, the regulation which equips our machines can be adapted to the customer's request according to its use and according to its implementation, we have several axes and several levers according to the customer's requirements depending on whether he prefers water production or consumption.



### Application solaire

Implantation BAHREIN  
 Consommation électrique : 18KW  
 produite sur site avec panneaux solaires hybrides  
 Puissance froid installée : 2MW  
 Surface de panneaux solaire 4600m<sup>2</sup>  
 technologie sous vide  
 Production journalière 100 000 litres/jour  
 Groupes froids fonctionnant au gaz naturel  
 Option : purification de l'air par un traitement  
 ionisation catalytique de l'air  
 Consommation humaine  
 Condenseur 12 modules de 40 pieds  
 Production de froid : 4 modules de 40 pieds



### Application gaz

Implantation MAGREB, zone côtière  
 Consommation électrique : 16.6 KW  
 Consommation gaz naturel : 720Nm<sup>3</sup>/h  
 Production journalière 80m<sup>3</sup> jour  
 Groupes froids fonctionnant au gaz naturel  
 Irrigation et chauffage de Serres  
 Puissance froid 1160kw  
 Puissance chaud : 480kw  
 Condenseur : 8 modules de 40 pieds  
 Production de froid : 4 modules de 40 pieds

**Projets en  
cours d'étude**

### Récupération eau surchauffée site industrielle

Récupération de 130m<sup>3</sup>/h au régime 90/80  
 Puissance froid 1300kW  
 Consommation électrique 9 kW produite sur site  
 Implantation Europe du sud, zone côtière  
 Production journalière 130 000 litres jour  
 Eau déminéralisée pour autoconsommation sur site  
 Condenseur : 12 modules de 40 pieds  
 Production de froid : 1 module de 10 pieds



### Production électrique

Consommation électrique  
 Puissance froid 1300kw  
 Implantation zone persique  
 Production journalière 130 000 litres jour  
 D'eau déminéralisée pour autoconsommation sur site  
 Condenseur : 13 modules de 40 pieds  
 Production de froid : 1 module de 40 pieds

