

H<sub>2</sub>

# Evaporation Electrolysis

*The technology for resource-efficient  
and cost-effective hydrogen production*



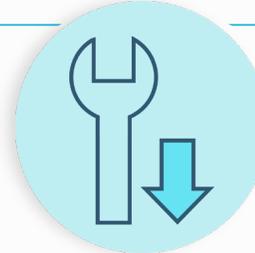
# Evaporation electrolysis surpasses all other electrolyser systems.



Use of seawater and industrial wastewater  
(**<45'000 TDS**)



No stack degradation



Minimal maintenance requirements



Oxygen and hydrogen of the highest purity  
(**>5.0**)



Unmatched overall efficiency  
(**>84%**)



**30%** lower energy costs compared to other systems



**\$222'000'000\***  
lower lifecycle costs

# Why choosing our Evaporation Electrolysis

Efficiency and Cost Savings

## Evaporation Electrolysis

### Highest Efficiency on the Market:

Unmatched efficiency of **over 84% in the overall system** throughout the entire lifecycle of the plant, converting seawater, wastewater, or surface water into high-purity hydrogen and oxygen.



### Consistent Energy Consumption:

No stack degradation occurs, ensuring the system maintains consistent energy consumption. This enables precise production planning and ensures long-term supply security.



### Lower Operating Costs:

Over the entire lifecycle, more than **>\$222\* million** can be saved compared to a PEM electrolysis system with the same production capacity.



## PEM/AEM/AEL Electrolyzer Systems

### Inefficient Efficiency:

PEM/AEM/AEL electrolyzer systems achieve an **average efficiency of 57%**.

### Unpredictable Energy Demand:

Due to stack degradation, the energy demand of such a system increases unpredictably, significantly complicating power supply and production planning.

### High Operating Costs:

The high operating costs result in a non-competitive hydrogen price.

# Some more benefits from our technology

Resource Conservation and Environmental Friendliness

## Evaporation Electrolysis

### Preservation of Drinking Water Resources:

The use of seawater, industrial wastewater, and waters of any type (TDS < 45,000 ppm) preserves the valuable and vital resource of drinking water.



## PEM/AEM/AEL Electrolyzer Systems

### Use of Drinking Water:

All other electrolyzer technologies must use drinking water for production. The diminishing resource of drinking water is often transported from typically arid regions to other countries.

### Seawater Utilization with Added Value:

When using seawater for hydrogen production, table salt can be extracted from the resulting concentrate.



### Contaminated Byproducts:

When reverse osmosis is applied to seawater prior to other electrolyzers for treatment, the seawater salt usually remains as a contaminated waste product.

# 1. Adoption of the principle of a patented and industrially applied **water purification technology**



The water purification technology was developed to treat **industrial wastewater** (paint sludge, wastewater from crude oil extraction, etc.) and **seawater**.



The system's operation takes advantage of different evaporation enthalpies, separating the introduced solutions through **repeated cycles of evaporation and condensation**.



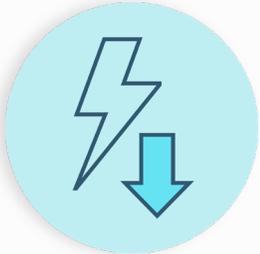
This principle also utilizes **evaporation electrolysis**. This purely physical process establishes optimal conditions for electrolysis, thereby enabling the generation of ultra-pure hydrogen and oxygen.



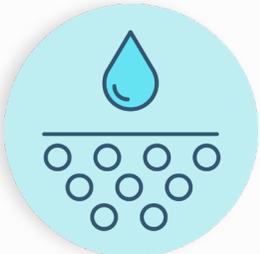
## 2. The patented and industrial-scale proven **electrolysis chamber**



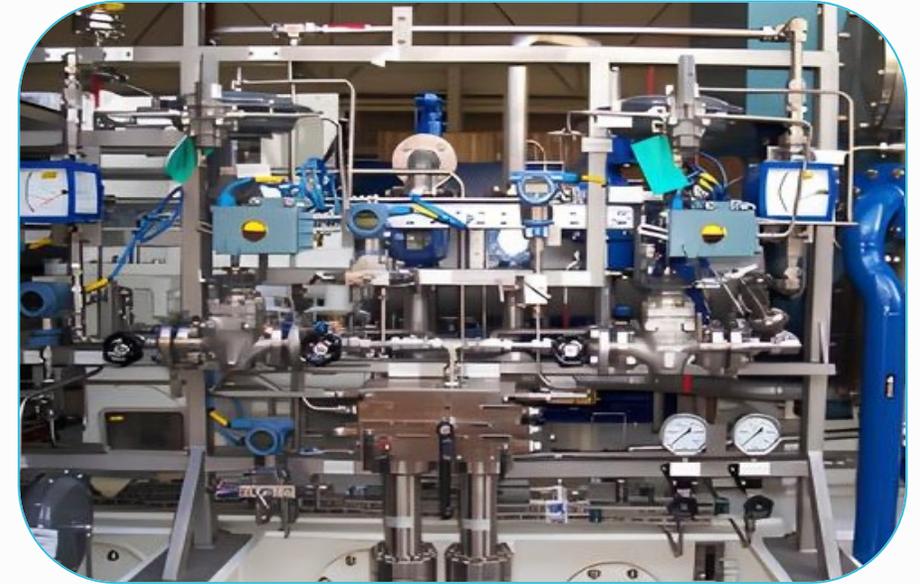
The second component of evaporation electrolysis takes advantage of the **fine water mist** generated during the evaporation and condensation process, which is directly conveyed into the specially designed electrolysis unit.



There, the self-dissociation of water is stimulated through the targeted control of pressure and temperature, allowing hydrogen to be produced in the electrolysis chamber with **minimal energy consumption**.



The system completely **avoids membranes** and instead uses potential gradients and specially developed porous materials for the separation of hydrogen and oxygen. This approach is characterized by high durability, low maintenance costs, and unmatched efficiency.



# Evaporation Electrolysis



The hydrogen modules process any kind of water, even **seawater or wastewater into green hydrogen (>5.0)**.

The following features should be emphasized:

- **Highest purity** directly from the process (**>5.0 / 99.999x%**)
- **Maximum flexibility** due to **hybrid operation** of the system (H<sub>2</sub>/H<sub>2</sub>O)
- **Modular design** (40ft container) → **individual scalability**
- **Most efficient technology** on the market for green hydrogen production
- Cost advantage of **over 222\* million USD** over the entire lifecycle
- **TRL 8**

*\* The life-cycle cost comparison was based on a 50 MW PEM system with an electricity price of \$0.05 per kWh*

# Already Developed Module

Module sizes	Water input		Hydrogen	Oxygen	Floor space
	m <sup>3</sup> /h	h/year	t/year	t/year	m <sup>2</sup>
<b>SH-1</b>	1	8'640	773	6'138	180
<b>SH-2</b>	2	17'280	1'546	12'276	220
<b>SH-3</b>	3	25'920	2'319	18'414	260
<b>SH-4</b>	4	34'560	3'092	24'552	300
<b>SH-5</b>	5	43'200	3'865	30'690	360
<b>SH-10</b>	10	86'400	7'730	61'380	520

## Contact Details

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We sincerely thank you for your interest in acquiring our **water separation and evaporation electrolysis solutions**. We are confident that this technology offers significant value in global drinking water and hydrogen production, and we look forward to the opportunity to discuss the next steps for acquiring the equipments with you.

If you have any further questions or require additional information, we are more than happy to arrange a personal meeting.

**Please feel free to contact us using the details provided below:**

Contact Person: **Julio Ortega**

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Position: **CEO Grupo Innovación Activa**

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For all communication and appointments regarding this Project, please use the e-mail address below.

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Best regards!

## Disclaimer

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