

Congreso Nacional del Medio Ambiente
Madrid del 31 de mayo al 03 de junio de 2021

SOSTENIBILIDAD Y EFICIENCIA ENERGÉTICA EN LA DESALINIZACIÓN DE AGUA DE MAR: PROYECTO LIFE DREAMER.

Jorge J. Malfeito
Nexo Agua y Energía. Experiencias de innovación.
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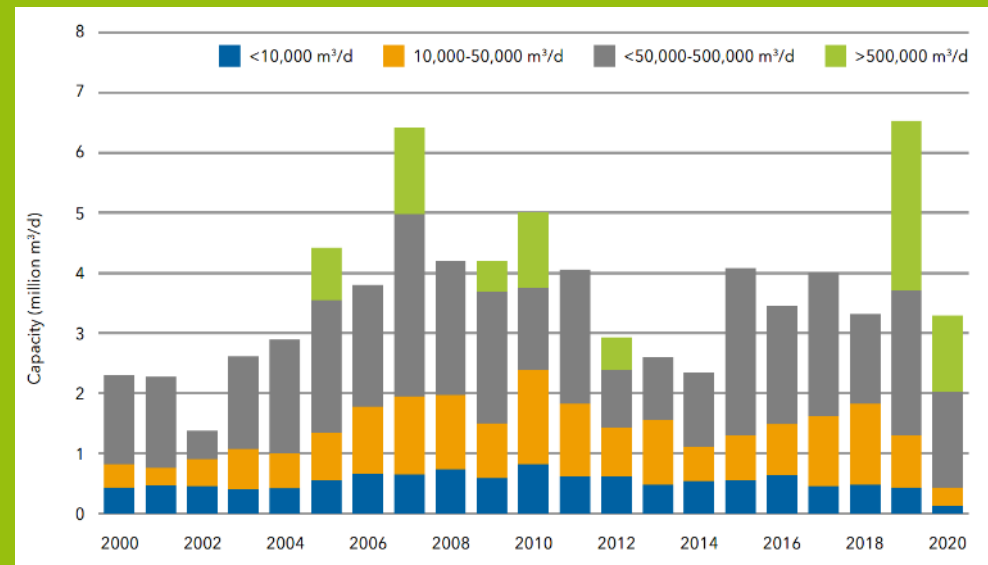


- 01** RO desalination: drivers for innovation.
- 02** Desalination market.
- 03** Sustainability: RO desalination energy costs.
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- 05** Circular Economy and RO desalination.
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RO desalination: drivers for innovation.

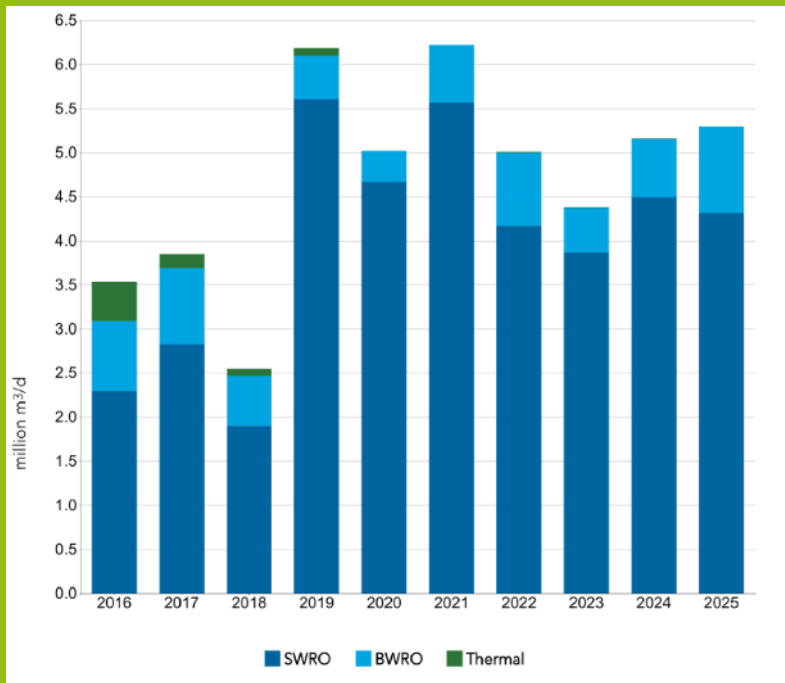
- Market.
- Sustainability.
- Circular Economy.

Cumulative contracted desalination capacity 1965-2020.
90 mill m³/D

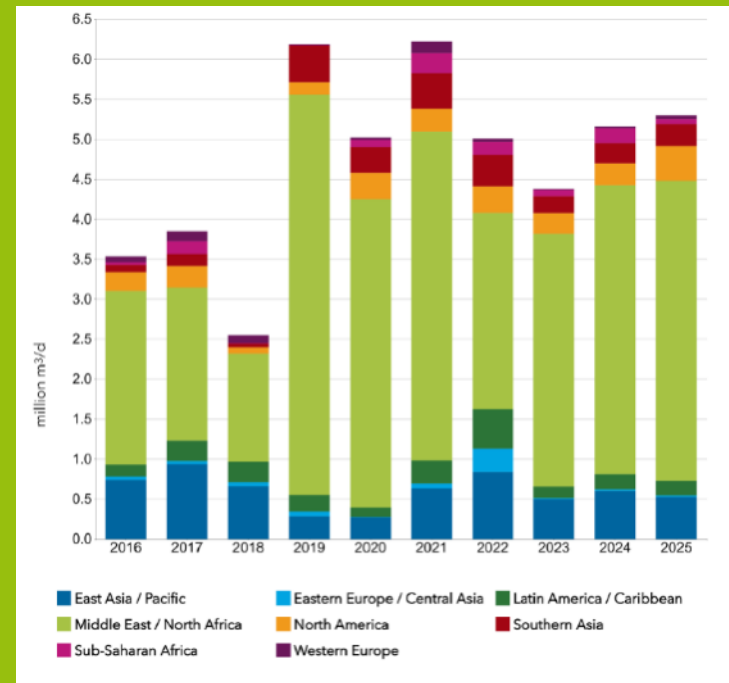


Contracted desalination capacity by plant size (2000–2020).

Desalination market.

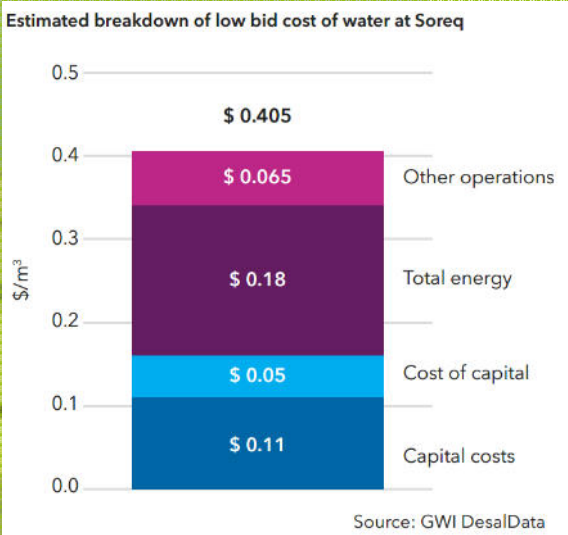
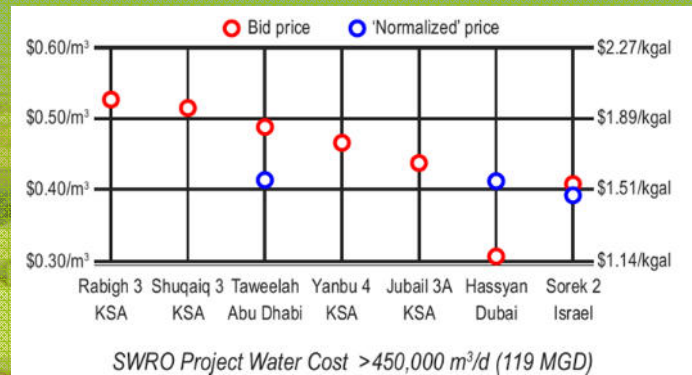


Global contracted desalination capacity.



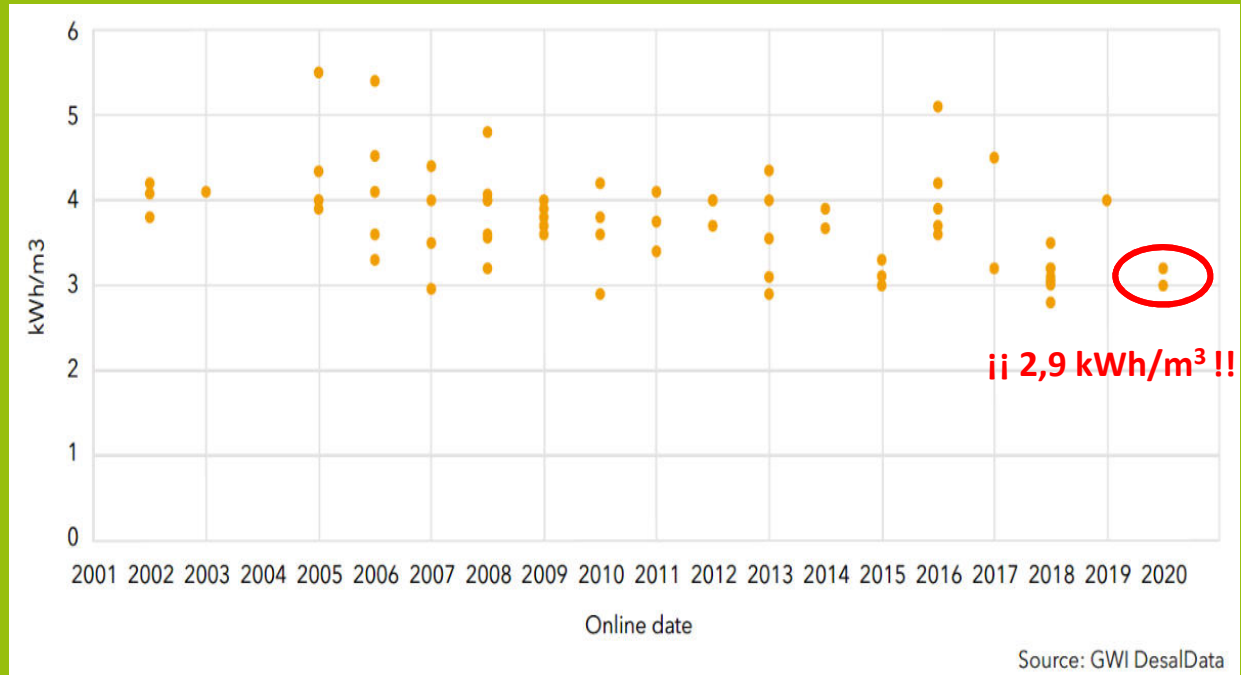
Contracted desalination capacity by región (2016-2025).

Desalination market.



Currently the lowest reported bid to reach financial close is **\$0.405/m³** - 620,000 m³/d Soreq 2 (May 2020).

Sustainability: RO desalination energy costs.



Energy consumption per m³ of water in desalination projects 2001-2020.

Sustainability: RO desalination energy costs

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11 March, 2021

Saudi Arabia's Mobile Desalination Plants Achieving a New World Record "2.27 kW per cubic meter" Lowest Energy Consumption

Corporate Member News

A new Saudi Number at Guinness: The World's Lowest Energy-Consuming Mobile desalination plants. SWCC sets a new record of unprecedented Guinness World Records of reducing the energy consumption in its new mobile plants to 2.27 kW per cubic meter of desalinated water. In favor of strengthen its global leadership on the desalination industry by reducing the cost of produced water and decreasing the use of power which contributes as a positive impact in saving the environment.

SWCC sets Guinness record for lowest energy consumption in water desalination

By [Ahmed Saeed](#)

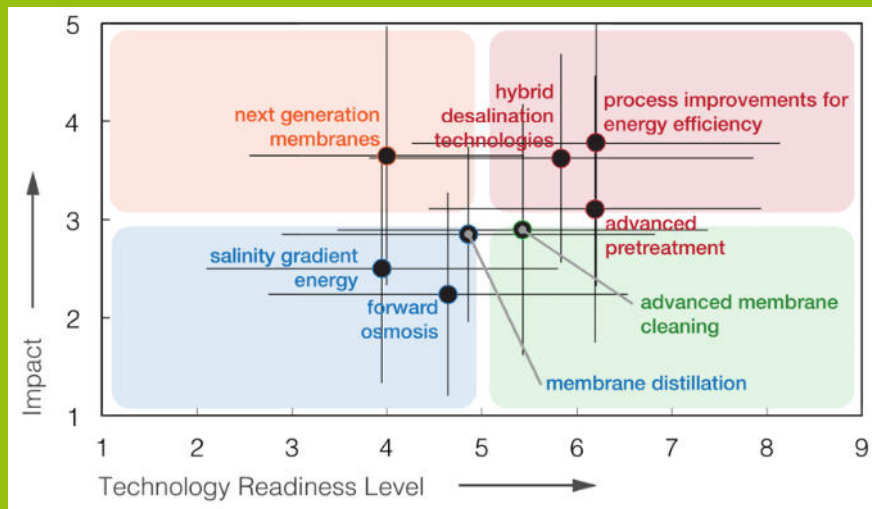
Posted on March 26, 2021

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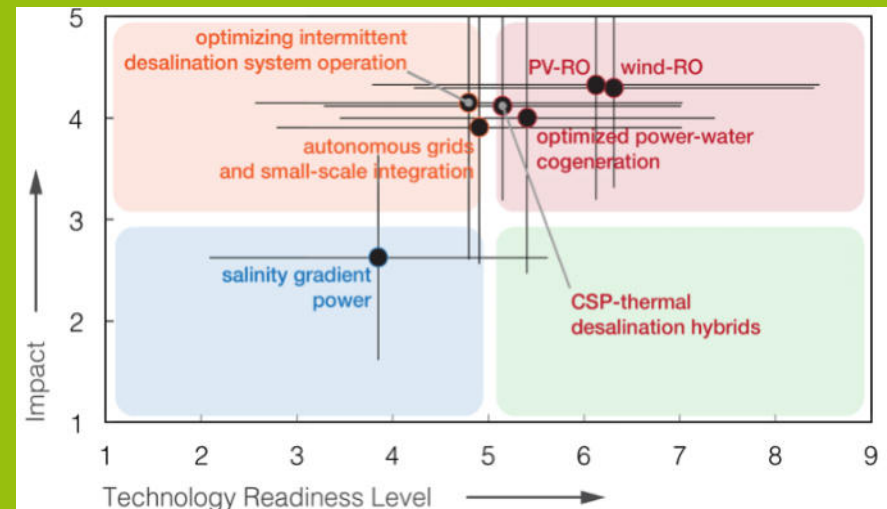
Saudi utility recognised for consuming only 2.27kWh for every cubic metre of desalinated water produced

The Saudi Water Conversion Corporation (SWCC) has been recognized by Guinness World Records™ for the lowest energy consumption for a water desalination plant, with 2.27kWh consumed per cubic metre of desalinated water.

Sustainability: technologies for greenhouse gases reduction.



GHG Reduction versus Technology Readiness Level for Desalination Technologies.



GHG Impact versus Technology Readiness Level for Several Low Carbon Desalination Systems.

REFERENCES

- Low Carbon Desalination: Status and Research, Development and Demonstration Needs Report. Development, and Demonstration Needs. Report of a Workshop conducted at the Massachusetts Institute of Technology (2016).
- Lienhard, John H., Gregory P. Thiel, David M. Warsinger, and Leonardo D. Banchik eds .

Circular Economy and RO desalination.

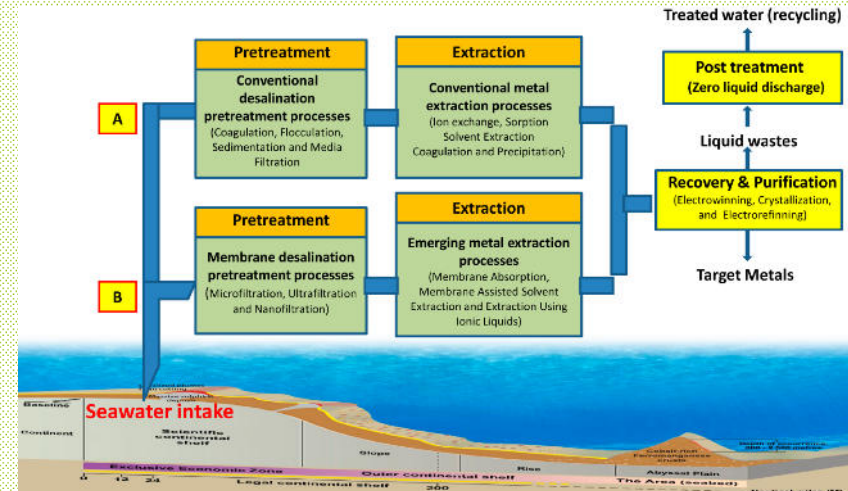
- Water mining

Metal Extracted	kg/400,000 m ³ Seawater	(€/kg of element)	Indicative Value (€)	Extracted form
Boron	1,840	4.50	8,280	Borax
Lithium	40	50.00	2,000	Li ₂ CO ₃
Magnesium	508,800	1.29	656,352	Mg(OH) ₂
Potassium	152,000	0.95	144,400	K ₂ SO ₄
Calcium	160,000	0.30	47,600	0
Strontium	5,200	7.00	36,400	SrCl ₂
Total	827,960	-	895,032	-
Total p.a.	302,205,400	-	326,686,680	-

Rb is not included due to limited market size.

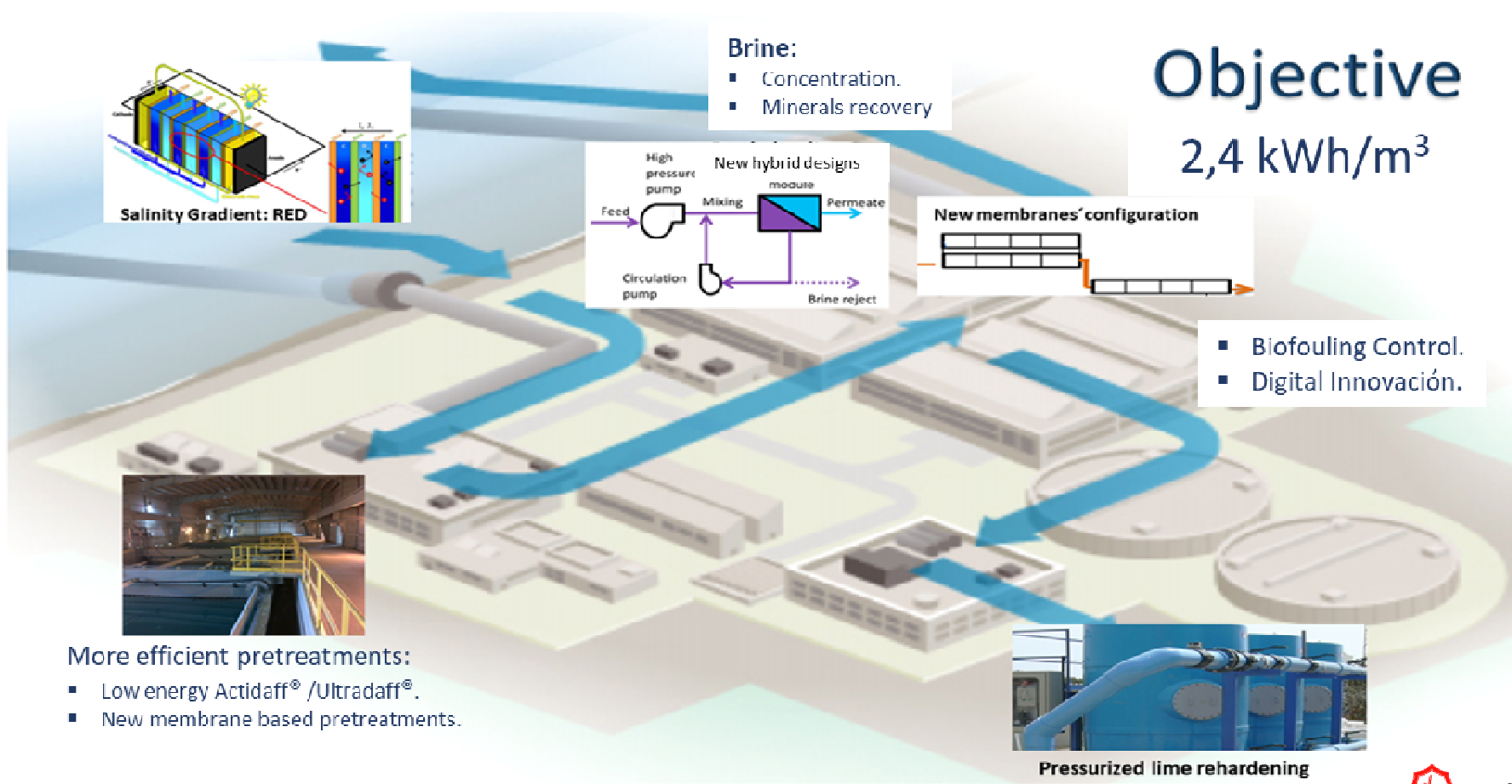
Target metals for extraction for the elements based on stoichiometry of the extracted forms.

- Materials recovery: i.e. RO modules.



Seawater mining: extraction of dissolved ions of critical metals and elements from seawater using conventional and emerging separation processes (Economic Technol. DOI: 10.1021/acs.est.5b00463)

What we do?

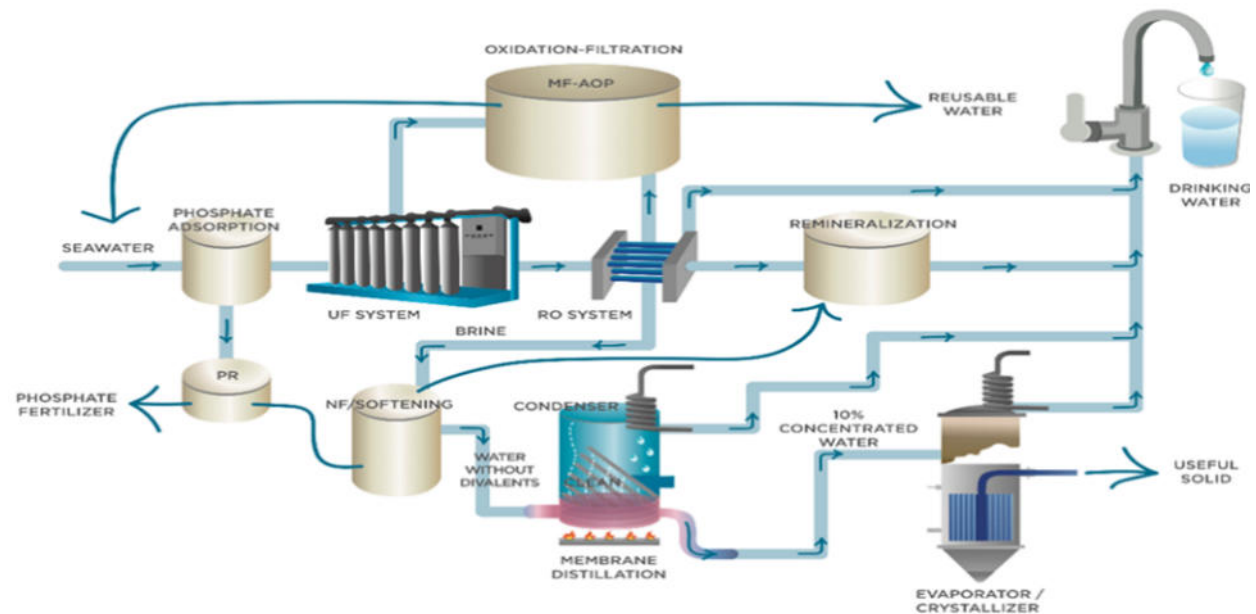


Life DREAMER

To **develop and demonstrate a highly resource-efficient desalination concept** where **seawater** is converted into **water** amenable for different uses **and valuable products** that can be used internally or valorised in other industries.

In particular:

- To increase the overall process water yield.
- To decrease the specific energy consumption.
- To reduce the external reagents needed.
- To decrease the overall environmental impact.



Life DREAMER

Tratamiento	Procesos considerados	Aumento conversión	Disminución consumo químicos	Obtención sub-productos valorizables	Disminución impacto ambiental
Filtración por lecho granular	<ul style="list-style-type: none"> Adsorción de P 		✓	✓	✓
Tratamiento efluentes de lavado	<ul style="list-style-type: none"> Ultrafiltración+ decantación Procesos avanzados de oxidación 	✓			✓
Concentración de salmueras y remineralización	<ul style="list-style-type: none"> Nanofiltración + destilación por membranas Precipitación química + UF cerámica + destilación por membranas 	✓	✓	✓	✓



Life DREAMER

- To increase the water recovery of desalination systems from the 45% to over 70%.
- To reduce 50% the internal use of chemicals used in desalination (specifically, reagents for remineralisation and those for RO membrane fouling prevention). Currently remin capacity: Ca 6-15 ppm & Mg 20 ppm
- To reduce the specific energy consumption (and associated greenhouse gas emissions) of desalination 10% thanks to the increased water recovery and the optimized operation of the treatment and recovery systems. Currently: 9%
- To evaluate the feasibility for full-scale application and demonstrated system in other geographical areas.



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¡Gracias!

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