



INTEGRATING NON-CONVENTIONAL WATERS INTO THE WATER MIX: CHALLENGES AND OPPORTUNITIES FOR BASIN-BASED IWRM

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WHY TALK ABOUT DESALINATION TODAY?



88%

*of the metropolitan territory
French under pressure
by 2050*

High Commission for Planning • June 2025

- A non-uniform resource

Depending on the territory, water is abundant or scarce, stable or unpredictable.
No universal answer.

- Documented pressures

Climate change, agricultural and industrial uses, urbanization, etc.

- Water mix?

Not depending on a water resource

- Several levers on the table

Sobriety / reduction of leaks / reuse of wastewater / desalination.

"In what system, in what territory, and under what conditions?"

DESALINATION TECHNOLOGIES

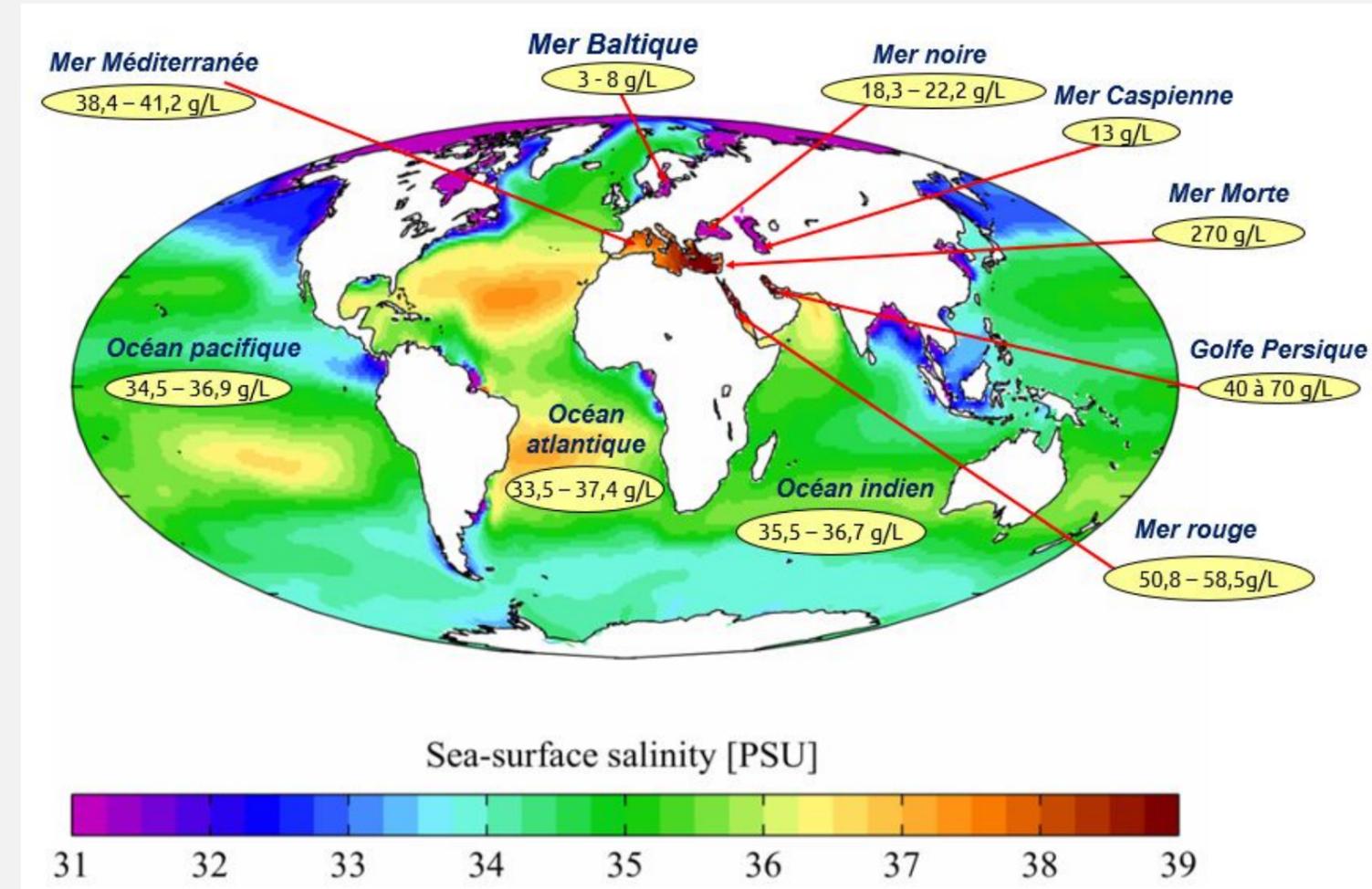
Soft water

Surface water: dam, lake,
 Groundwater: wells, boreholes
 Salinity: a few tens to a few hundred mg/l (< 1 g/l)



Salted water

Brackish water: 1 to 10 g/l
 Seawater: on average 35 g/l



DESALINATION TECHNOLOGIES

Thermal desalination

Distillation

Mimics the natural cycle: evaporation and then condensation. Old, reliable technology, still dominant in the Gulf countries thanks to cheap energy.

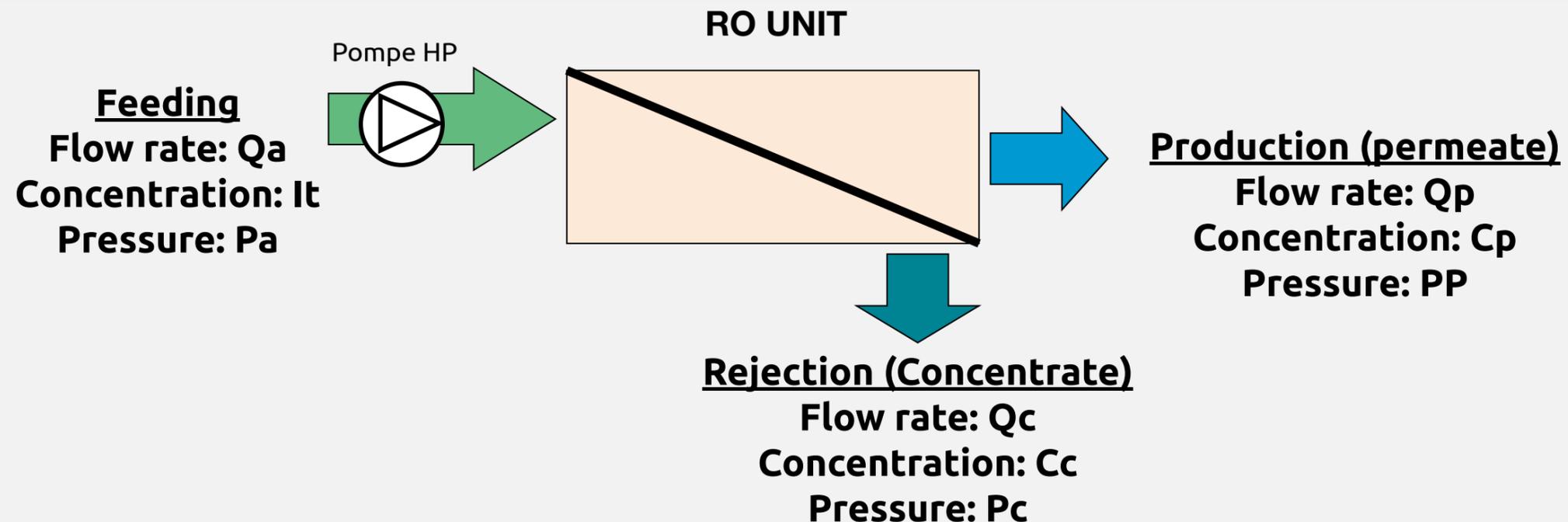
Proven process · High energy cost

Reverse Osmosis (RO)

Pressure filtration

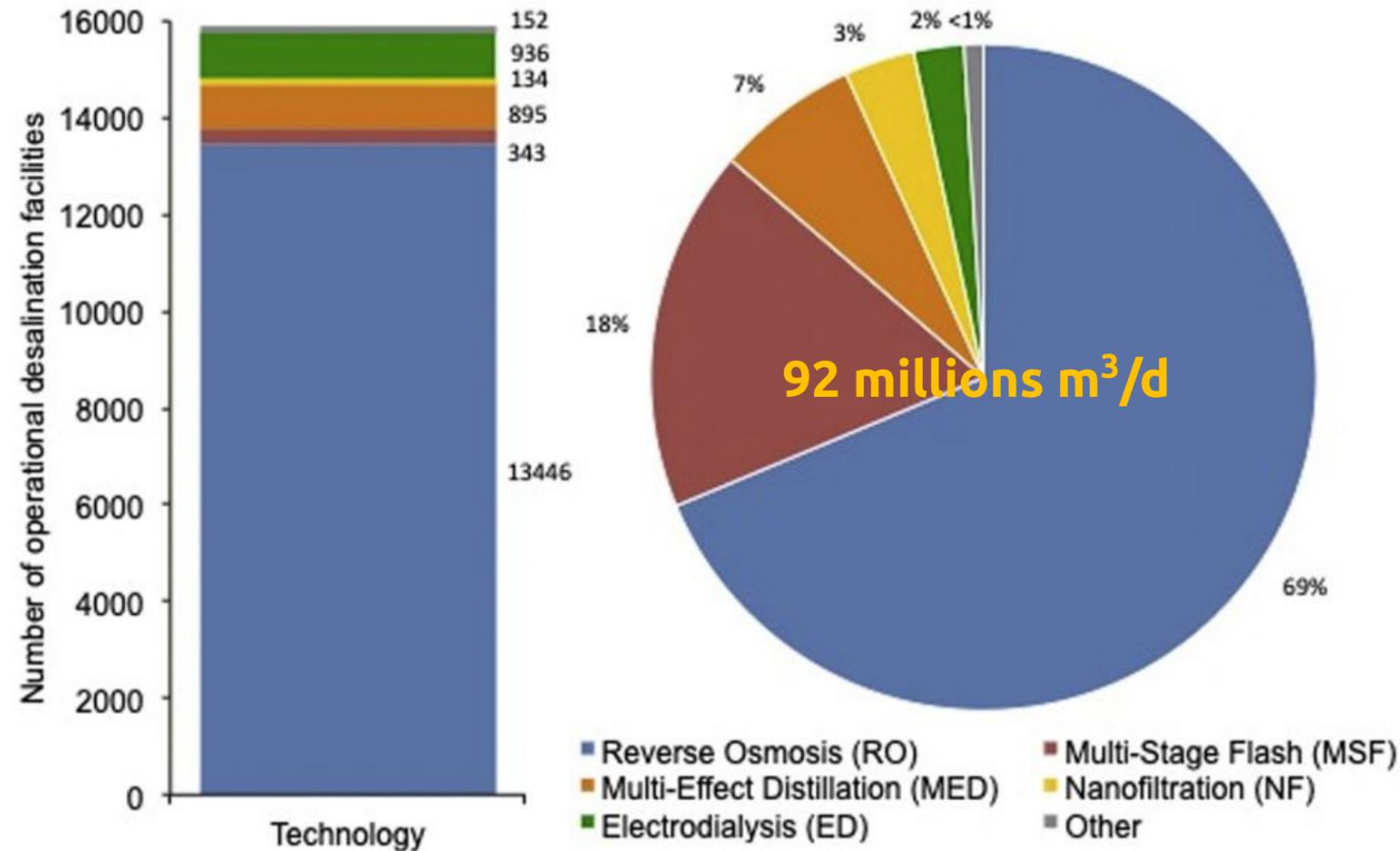
The salt water is pushed under high pressure (40–70 bar) through a semi-permeable membrane. Very pure water □ requires remineralization before distribution.

>69% of the global market share · Leading Technology



DESALINATION IN THE WORLD AND IN FRANCE

E. Jones et al. / Science of the Total Environment 657 (2019) 1343–1356



Worldwide

Near East and North Africa, Australia, the United States, China and Mediterranean Europe. Sustained annual growth.

In France

Still very limited use: Mayotte, Saint-Martin, Corsica, Île de Sein...

No national plan. Absent regulatory framework. Metropolitan resources are still relatively available.

ADVANTAGES AND LIMITATIONS: A BALANCED BALANCE SHEET

Benefits

An almost inexhaustible resource that is "independent" of the climate

Produced water of high sanitary quality

Mature technology, steadily declining costs

Diversification and resilience of the water mix

Vital solution for overseas islands and territories



Limitations

7-10× higher energy consumption than treated fresh water

Concentrated discharge: impact on marine ecosystems

Production cost higher than conventional supply chains

Lack of a regulatory framework for the example of France

Risk of "false solution": postponing sobriety and reducing leaks

WHEN AND WHERE TO CONSIDER DESALINATION?

Insufficient resources



Degraded resources



Future water stress



CONDITIONS FOR CONTROLLED INTEGRATION

Insufficient resources



Degraded resources



Future water stress



1

Update of the
regulation

2

Brine discharges

3

Resolve the
Energy Constraint

4

Analysis
Cost-benefit

5

Anticipating and
Plan

6

Synergies
industrial

7

Respecting the
Hierarchy

8

Train and explain

THREE PERSPECTIVES ON DESALINATION

Saudi Arabia

Technological approach



! Strategic vulnerability?

Spain

Management approach



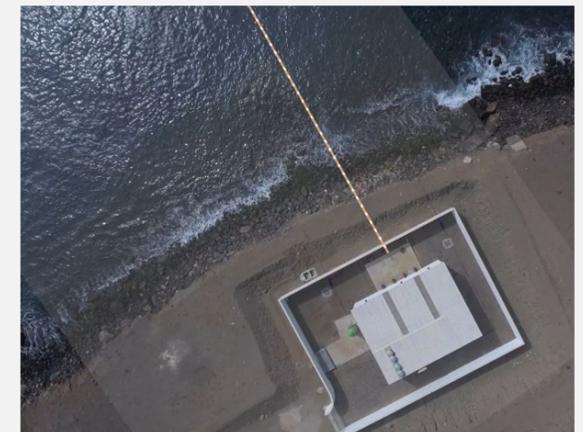
! Impact of anticipation.

Cape Verde

Governance Approach



! Technique alone is not enough



THE IMPORTANCE OF IWRM?

IWRM foundations

Shared knowledge

Technic

Funding

Governance

Environment

CONCLUSION: ONE TOOL AMONG OTHERS?

- **Desalination does not replace other levers: it complements them**
- **4 key ideas:**
 - A real solution BUT a demanding integration
 - Each territory has its own relationship to desalination
 - Anticipation!
 - Articulation with other levers

