



20 AÑOS
IMPULSANDO
EL FUTURO DEL AGUA
1998-2018

XII

CONGRESO INTERNACIONAL AEDyR

23-25
Octubre
2018



12th
INTERNATIONAL
CONGRESS
23-25 October 2018

AEDyR 20 años



Trends in Desalination & Water Reuse

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2018 Desalination in Figures

Around **20 300** Desalination Plants Worldwide(>100 m³/day) in **150** Countries

105 000 000 cubic meters per day is the Desalination Capacity built or under construction until today.

Over **300** Millions people in the World can drink water supplied by Desalination plants.

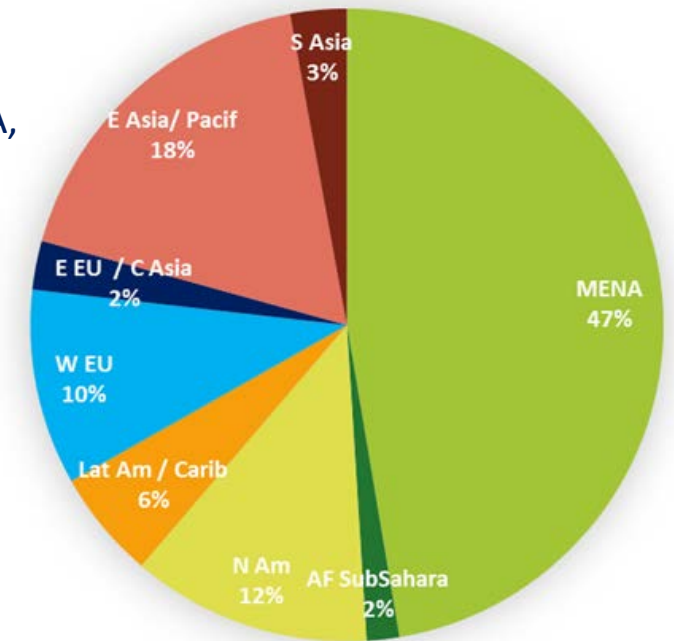
Plants	Desalination Plants - 31st Inventory	Capacity - m3/day
20,283	Total Plants	105,331,309
3,817	Off Line	7,115,761
15,962	In Operation	87,471,951
504	Under Construction	10,743,597
16,466	Under Construction + Operation	98,215,548



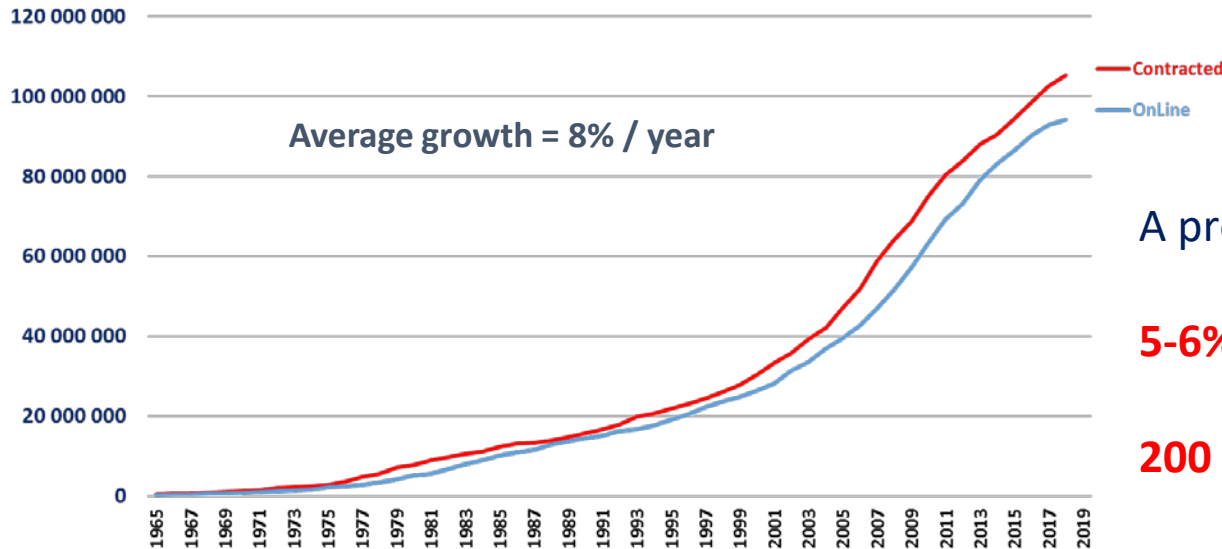
Growing Areas:

Middle East, Africa, USA, Latin America, India, China, SE Asia,

Installed Capacity by Region



Global Cumulative Capacity (m3/day)



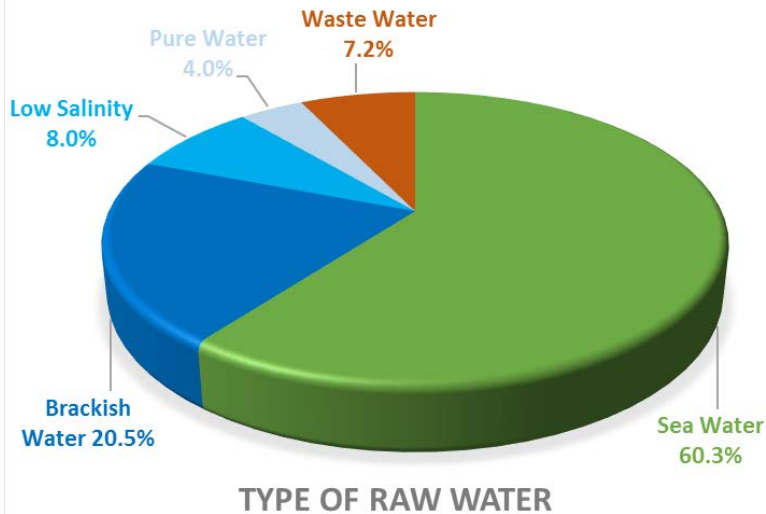
A promising future:

5-6% Expected growth

200 Mill. m³/day in 2030/32

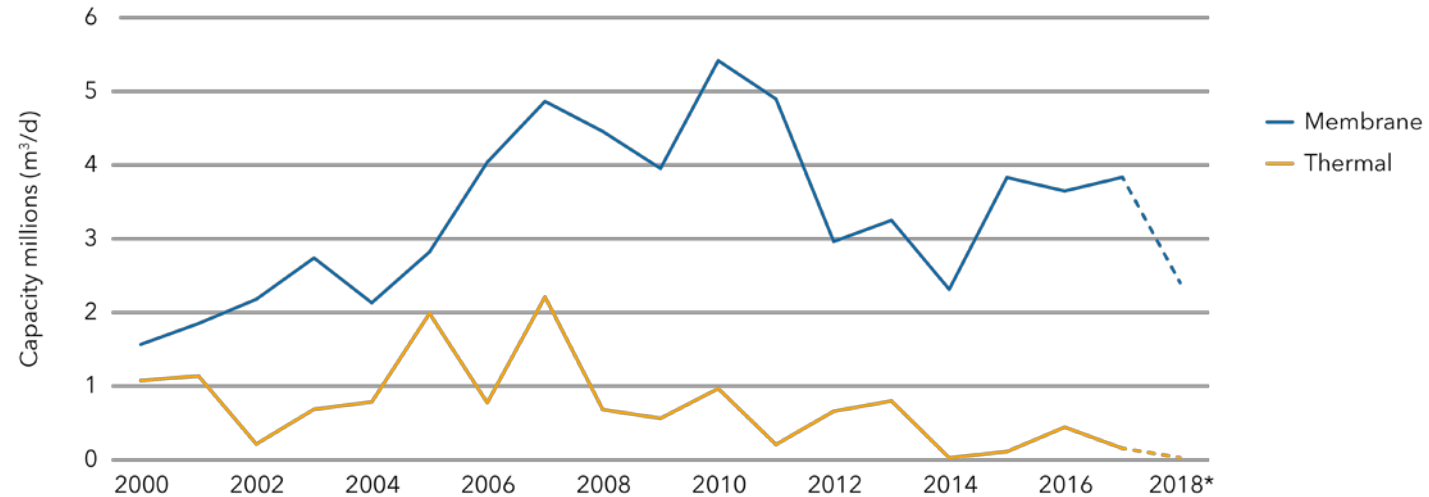
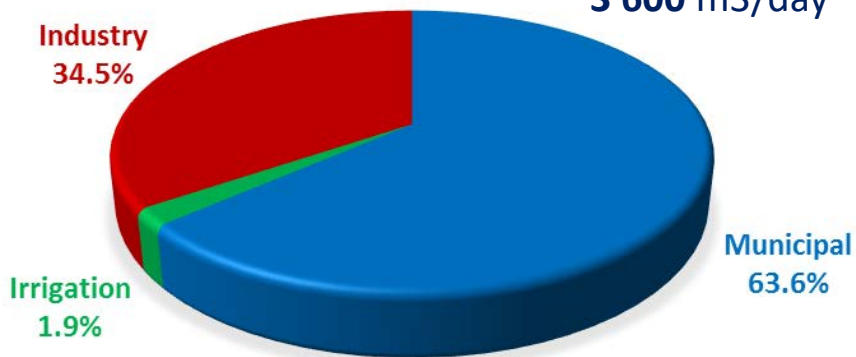
Sea water is confirmed as main source....

.... and Membranes the Solution



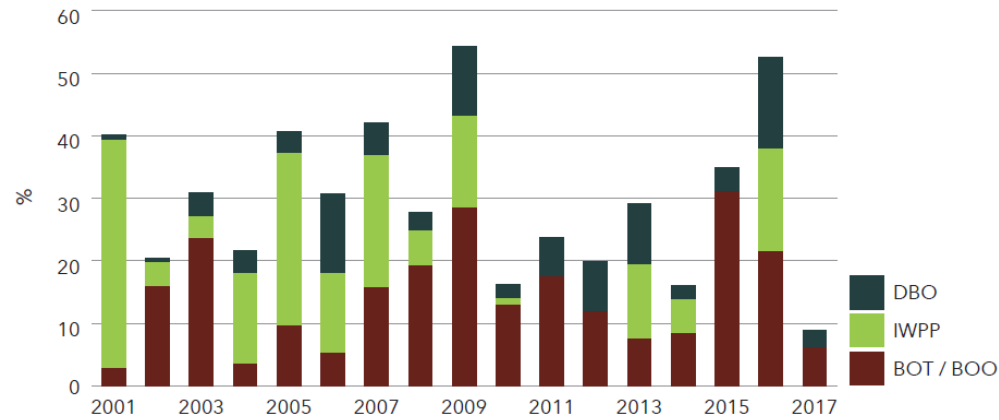
Higher size in Municipal
Average Municipal Plant:
8 600 m³/day
Average Industrial Plant :
3 600 m³/day

USER %



Membranes are actually prevailing in the Market: **> 95%**
Even in Middle East!
Evaporation become marginal

Large Plants Mainly in DBFO or DBO



Annual Contracted Capacity with Private Sector Involvement, after year 2000

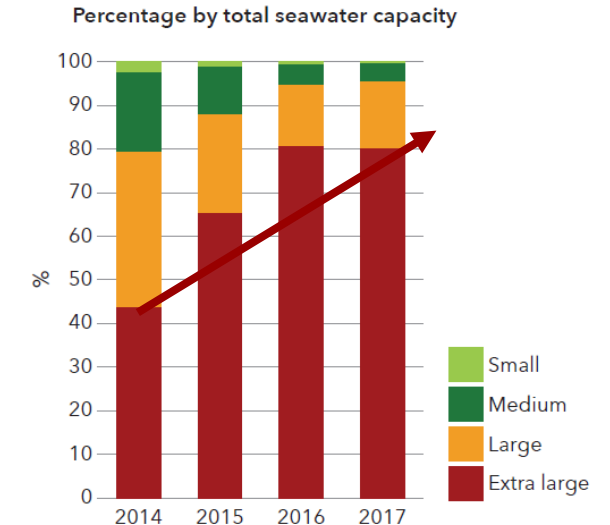
Total Plants	Procurement	m3/day	%	Average m3/day
268	DBFO /BOT/IWP/DBO	24,108,022	31.1%	89,955
10,308	DB/EPC	53,517,305	68.9%	5,192
10,576	Total	77,625,327		7,340

SW Plants	Procurement	m3/day	%	Average m3/day
207	DBFO /BOT/IWP/DBO	21,471,539	46.3%	103,727
3,321	DB/EPC	24,917,757	53.7%	7,503
3,528	Total	46,389,296		13,149

XL Plants in **DBFO** or **DBO** / O&M > 20 years

In 2018-2019 DBFO > 50% Market

DBFO not only in **ME**, also in **Africa, USA, LatAm ...**



Avg m3/day 6,872 10,668 21,968 27,218

Going to MegaTon concept →

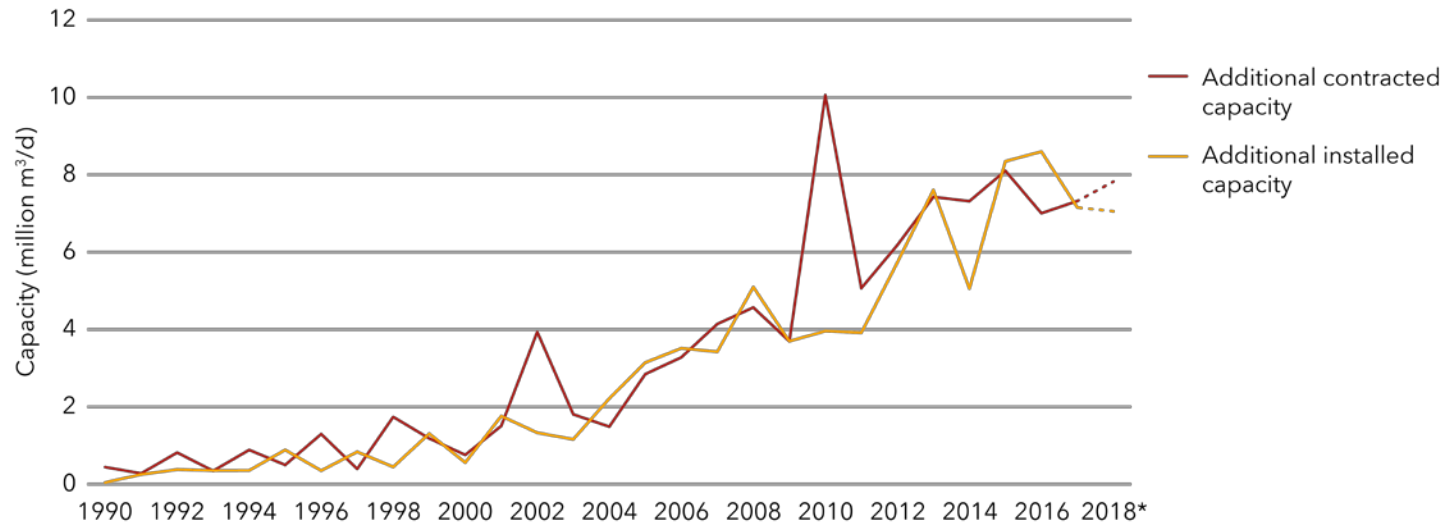
Taweelah, UAE:

910,000 m³/day

Al Jubail, KSA:

1,200,000 m³/day

Desalination & Reuse Complementary Solutions for Water Scarcity



New Annual Capacity of Municipal WW Reuse, 1990 -2018

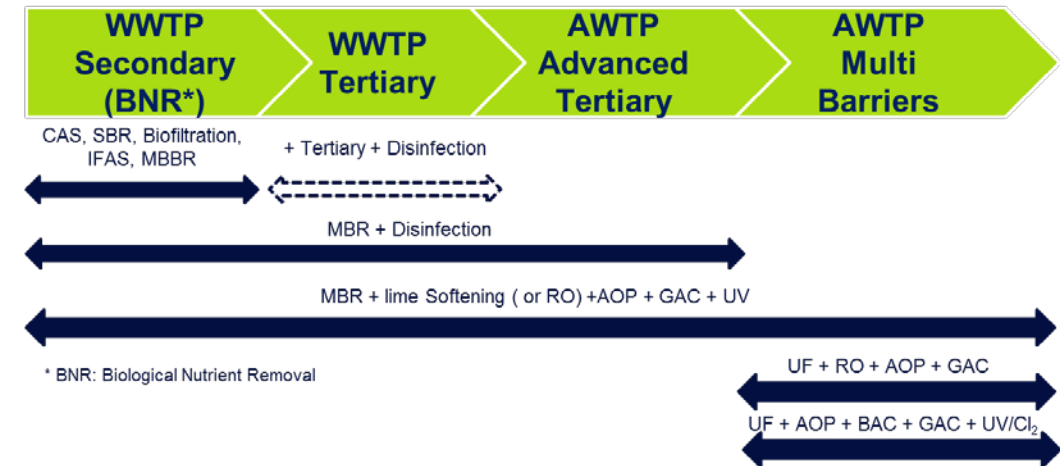
**WW Reuse is growing faster than Desalination
Similar Cumulate Capacity of Desalination approx.**

Key issues in WWR:

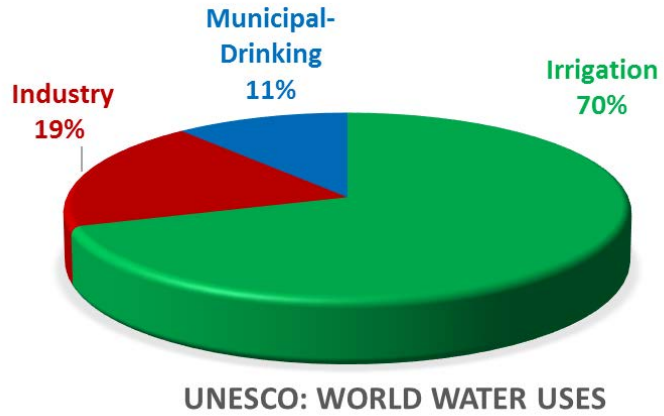
Integrated Water Management, Water Costs/Tariffs, Regulations, Promotion and Public Acceptance.

Different types of Water Reuse

1. **Basic Reuse or “De Facto”** (e.g. EU, USA)
2. **Tertiary** (e.g. South EU)
3. **Advanced Tertiary** (e.g. Switzerland, USA, Australia)
4. **Multi-Barriers** (e.g. Namibia, USA, Australia, Singapore)



Waste Water Reuse Market

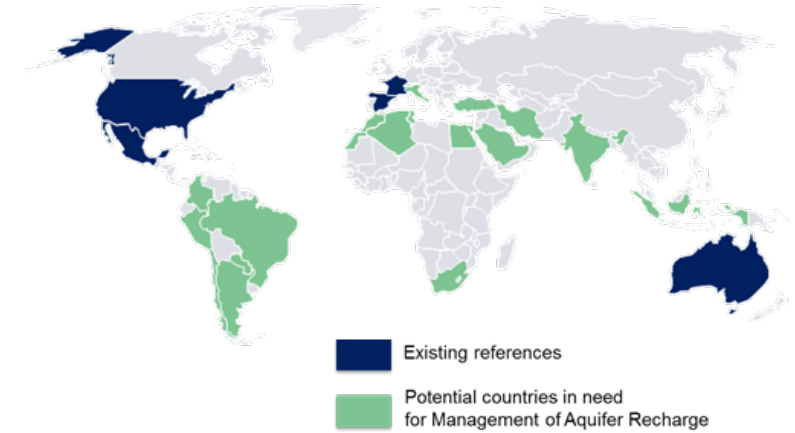


12% of fresh water withdrawn from agriculture could be replaced by treated wastewater (FAO)

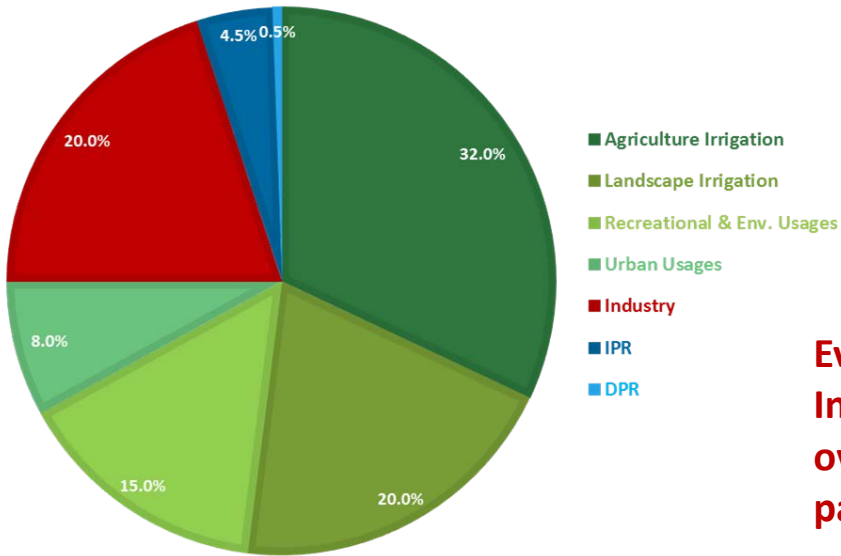
WWR: Only a limited number of countries are concerned

Singapore > 80%, Israel >70%, Kuwait > 35%, Spain >14%...
USA, Australia, Namibia, LatAm, South Africa...
and mainly China!!

Aquifers Recharge Worldwide



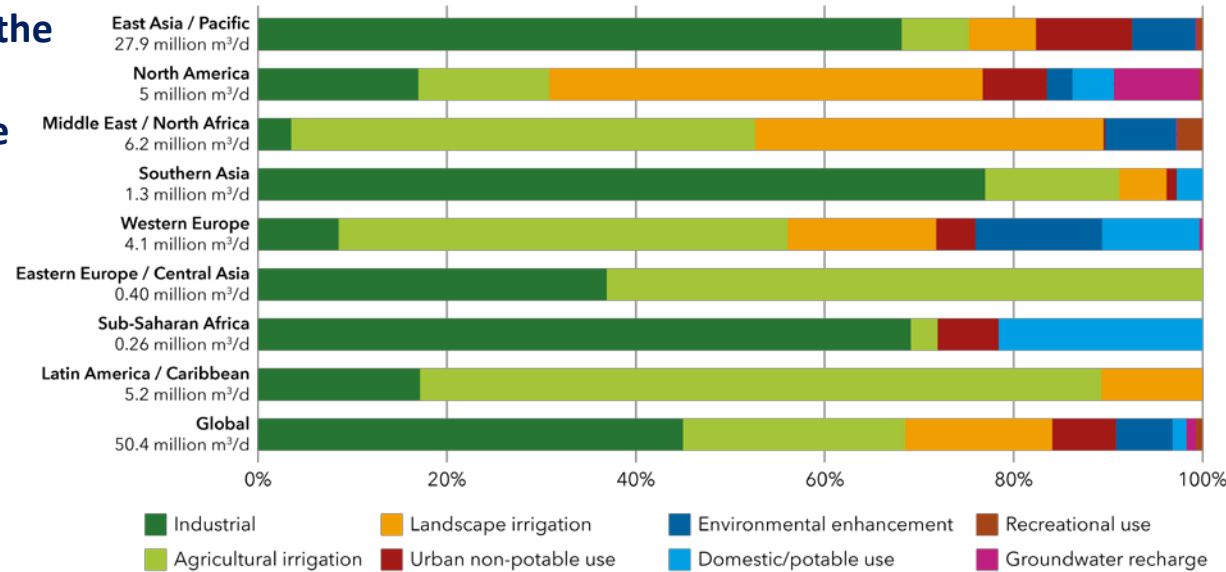
WW REUSE PRACTICES 1990 - 2014



WWR Market:
Industry & Irrigation are the largest by Volume
DPR/IPR and Industry the more technological

Evolution of WWR Market:
In last decade Industry has overtaking the Agriculture, particularly in Asia

Water Reuse: installed capacity by reuse application 2010-2017





Trends in Desalination & Water Reuse

Thank You
Muchas Gracias

Miguel Angel SANZ