

# Sorek Desalination Plant

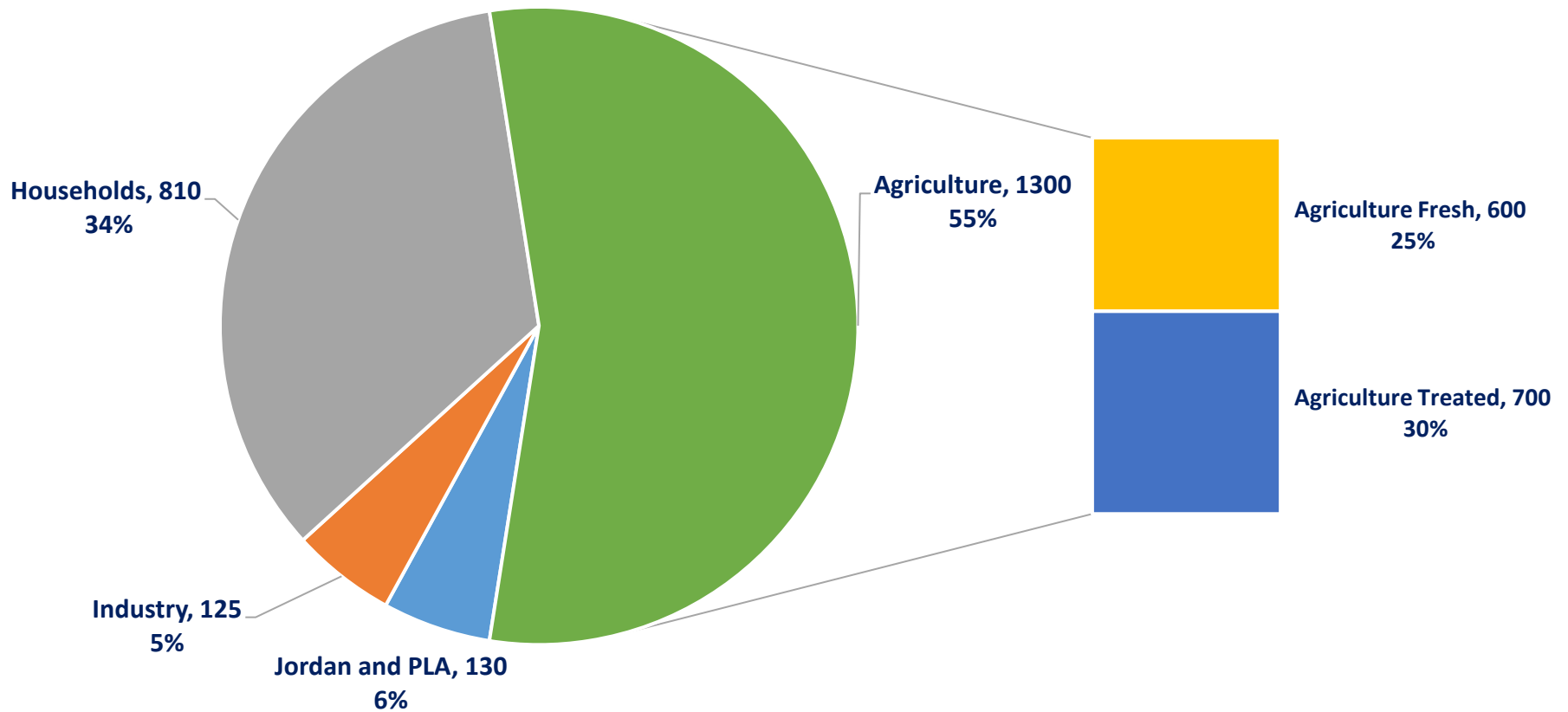
## 150 Mm<sup>3</sup>/y SWRO

NL-IL Mini-Symposium on Desalination and Clean Hydrogen Production

17/06/2021



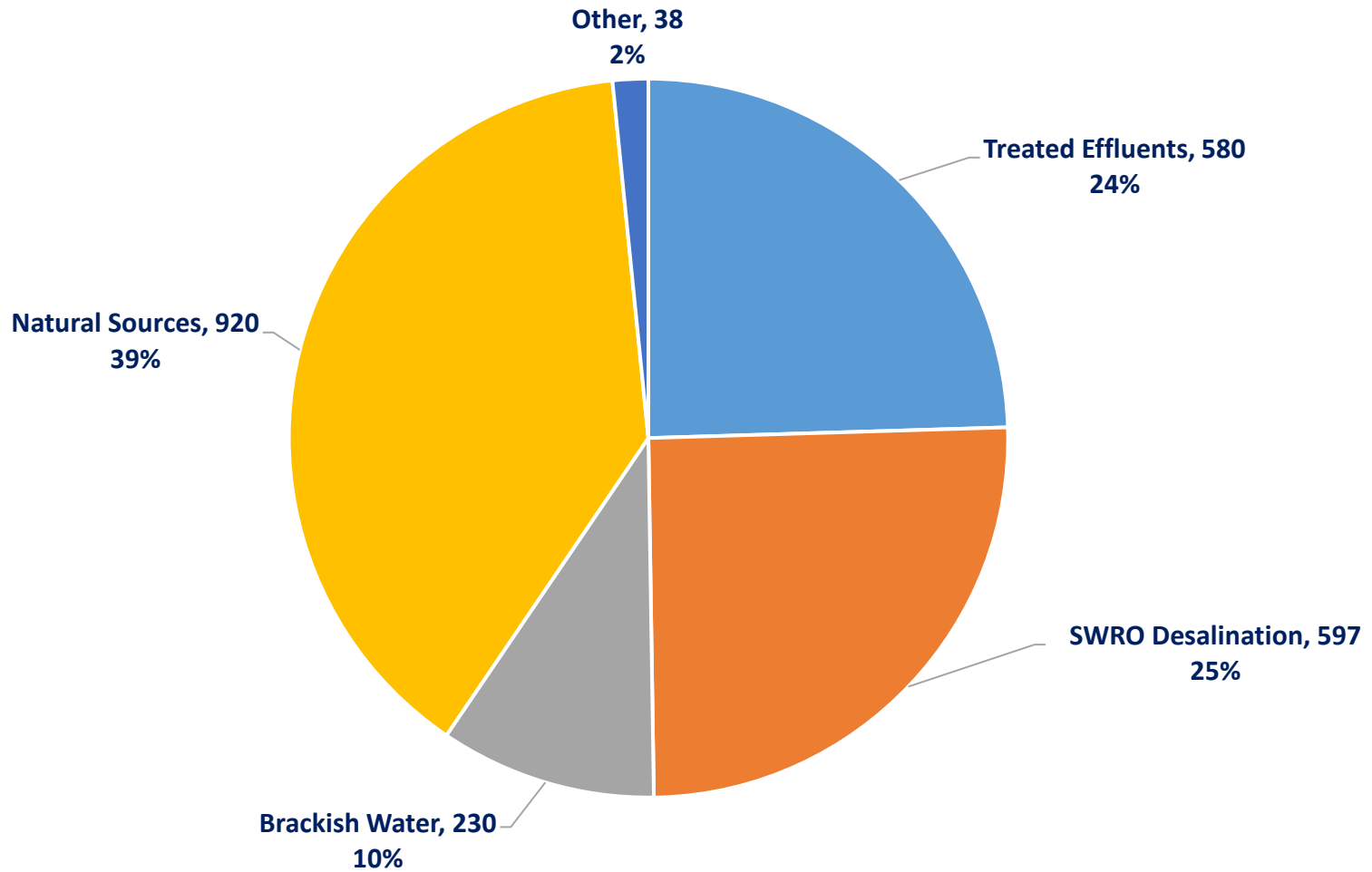
# Israel's Annual Water Consumption



Total consumption of 2.4B m<sup>3</sup> of water.



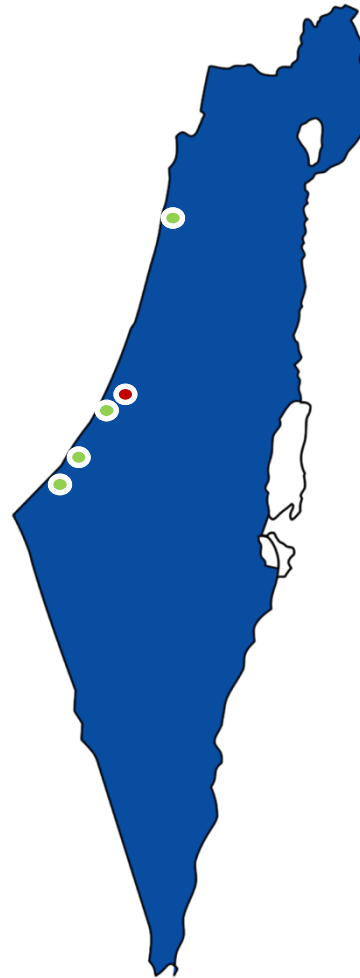
# Israel's Water Sources



# Desalination facilities in Israel

## 5 RO desalination facilities in Israel - total of 597M m<sup>3</sup> /y

- ◆ SOREK - 150M m<sup>3</sup> /y
- ◆ HADERA - 137M m<sup>3</sup> /y
- ◆ ASHKELON - 120M m<sup>3</sup> /y
- ◆ ASHDOD - 100M m<sup>3</sup> /y
- ◆ PALMACHIM - 90M m<sup>3</sup> /y



*Covers:*

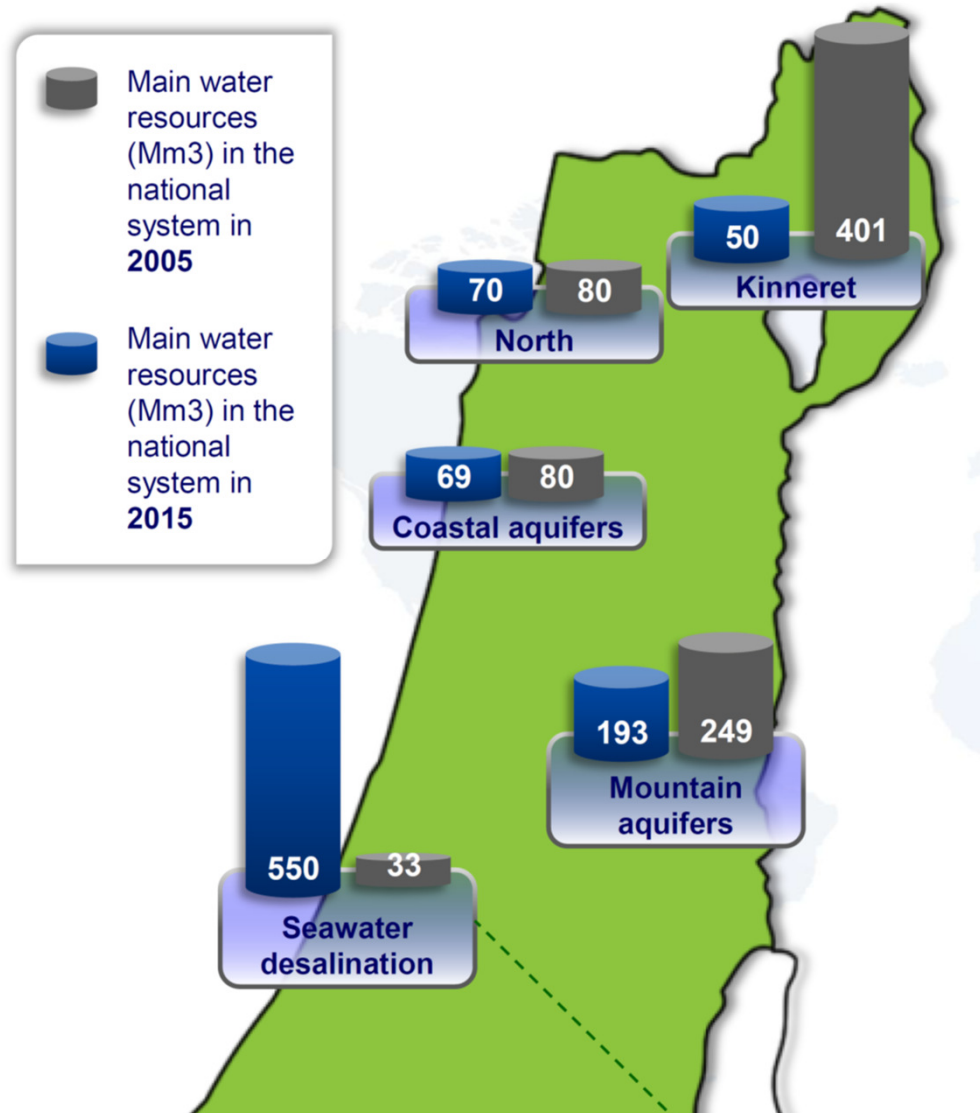
*25% of total water consumption.*

*36% of the annual total freshwater consumption.*

*74% of the households' requirements.*



# Desalination in Israel - then and now



# Sorek Seawater Desalination Plant

One of the largest SWRO desalination plants worldwide

- ◆ Capacity

150 Mm<sup>3</sup>/year (max. 24,000 m<sup>3</sup>/hr)

- ◆ Technology

Seawater Reverse Osmosis

- ◆ Project Type

25 years BOT (Build, Operate & Transfer)

- ◆ Location

Sorek, Israel





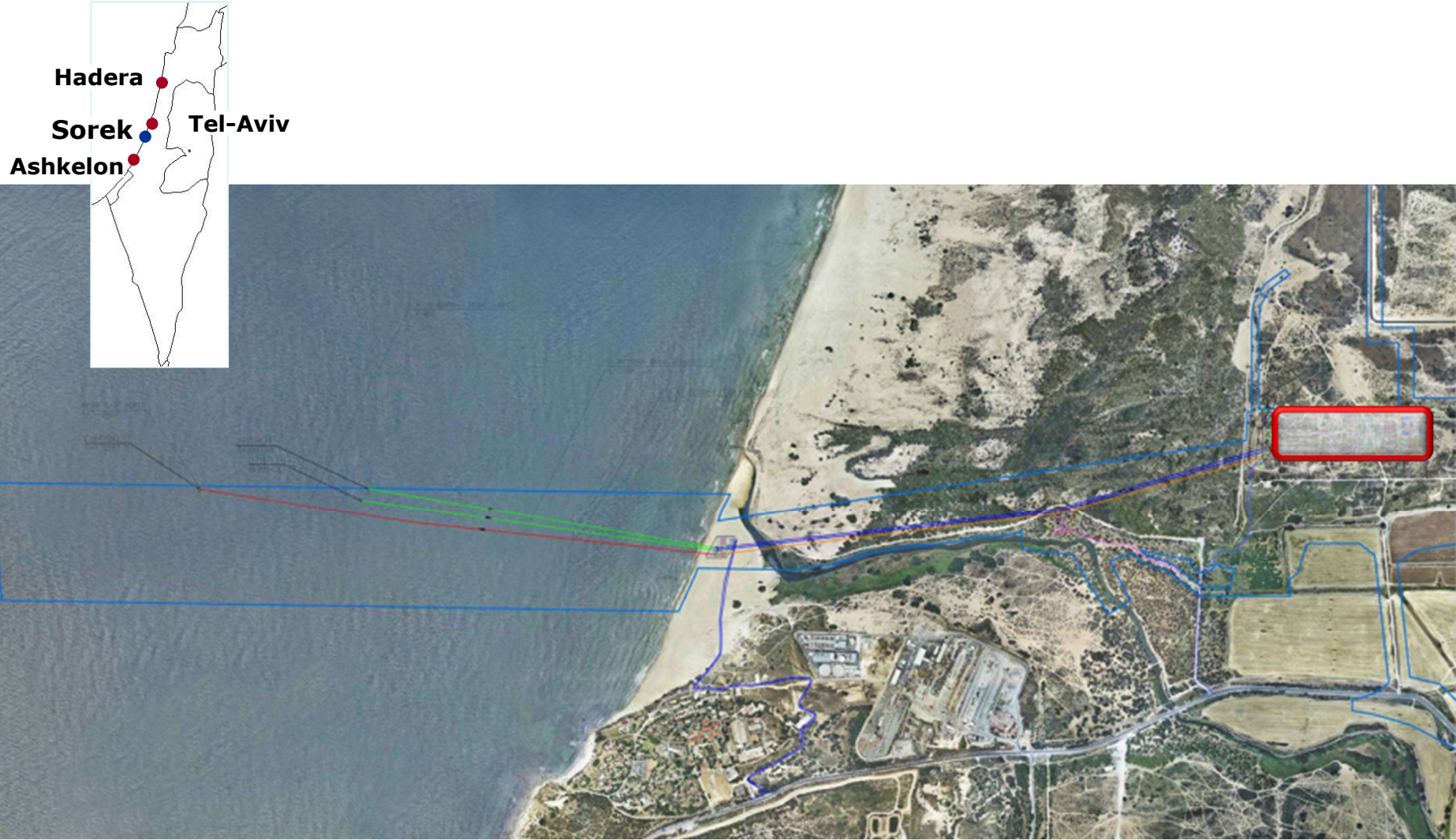
# Key Technical Parameters

- ◆ Total desalination capacity - 150 Mm<sup>3</sup>/year
- ◆ The Max.daily limit - 480,000 m<sup>3</sup>/day
- ◆ The Min.Daily limit - 375,000 m<sup>3</sup>/day
- ◆ Plant footprint - 590 m x 170 m ~ 10 Ha
- ◆ Product water requirements:
  - ◆ Potable water according to the Israeli MoH, Public Health Regulations & the Water Desalination Administration (WDA):

TDS: 300 ppm max.	<b>Cl: 20 ppm max.</b>
<b>B: 0.30 ppm max.</b>	pH: 7.8 ~ 8.5
LSI: 0 ~ 0.5	Turbidity: 0.5 NTU max.
Hardness: 80 – 120 ppm (CaCO <sub>3</sub> )	Alkalinity: 80 ppm min. (CaCO <sub>3</sub> )

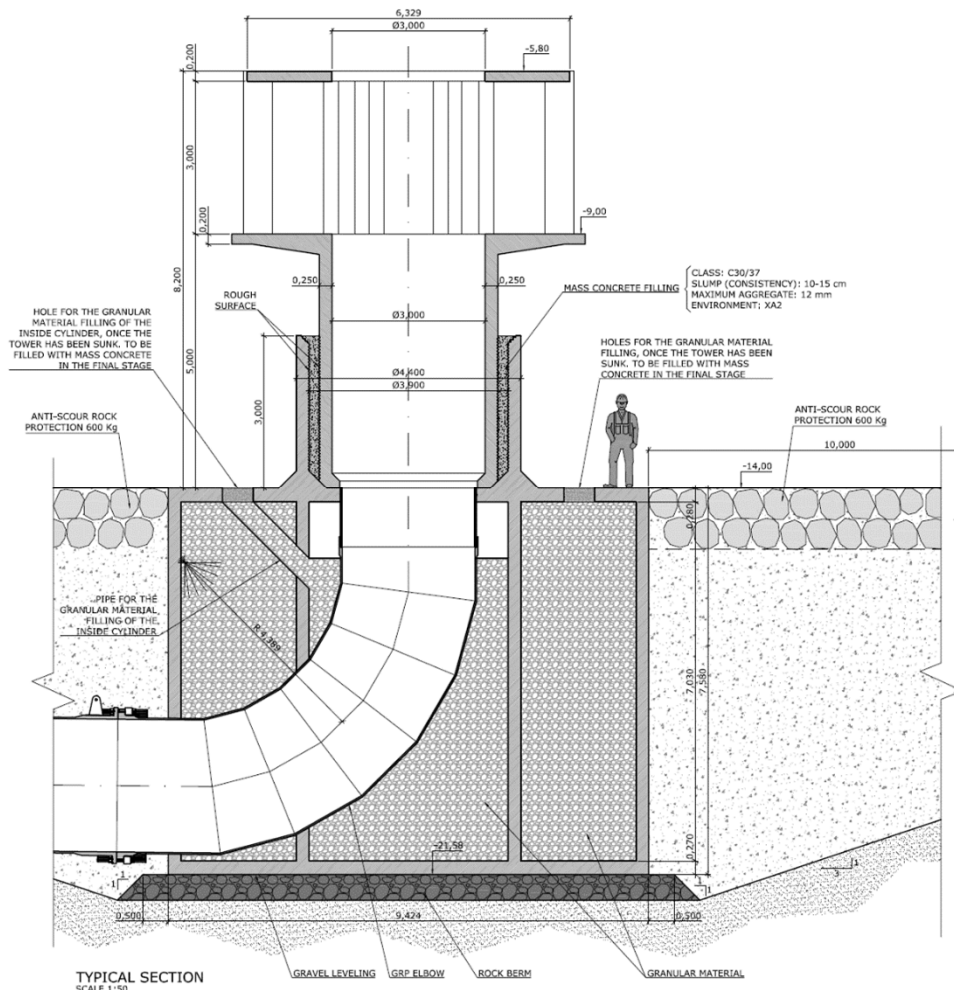


# Facility Location

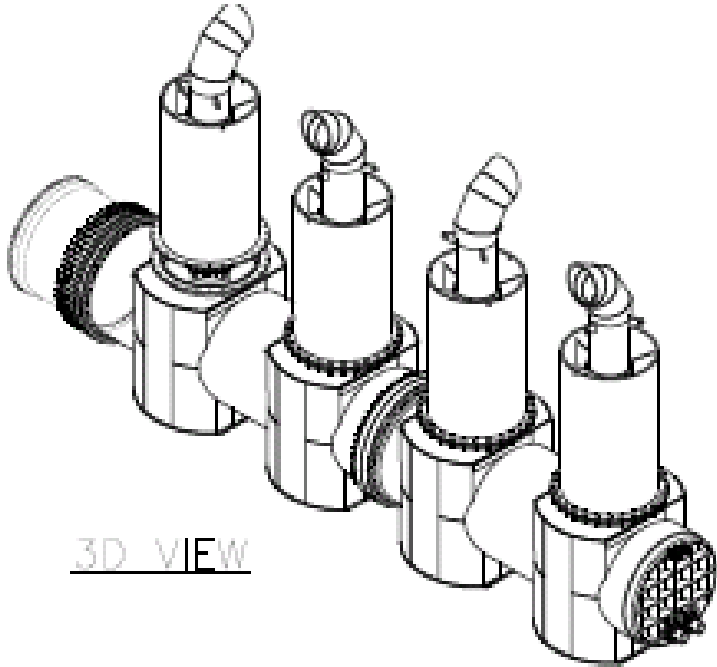




# Intake suction head



# Brine Diffuser





# General View of the Facility



**Area of 100,300 m<sup>2</sup> (10 Hectare)**



# General View of the Facility

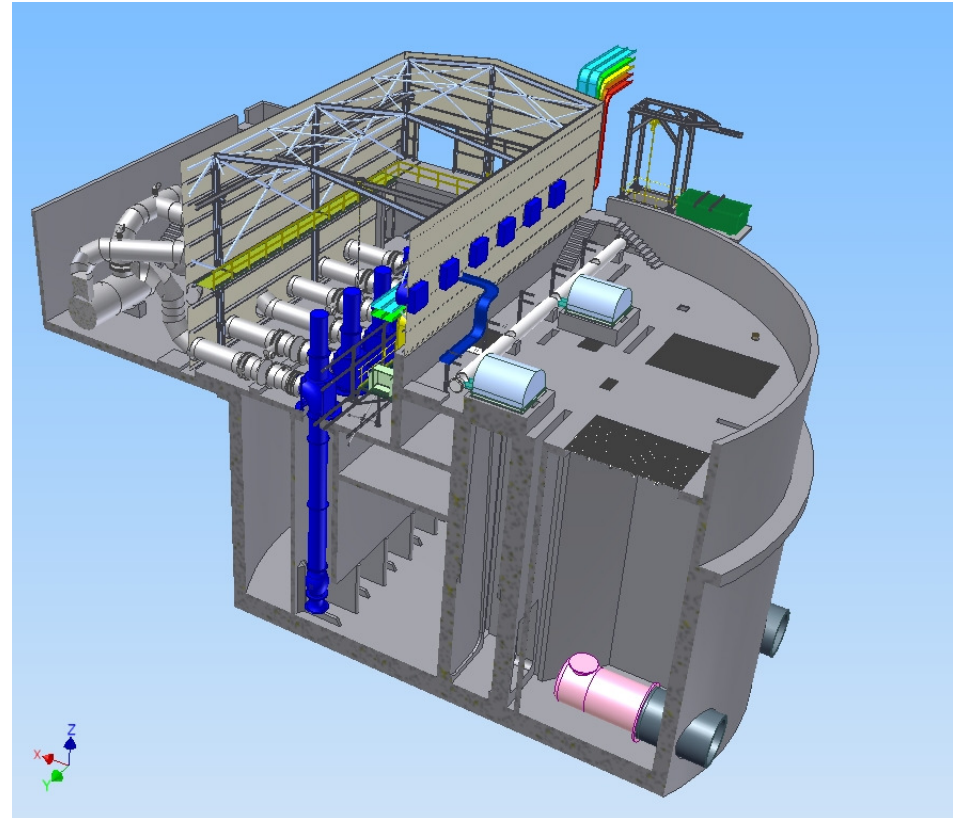
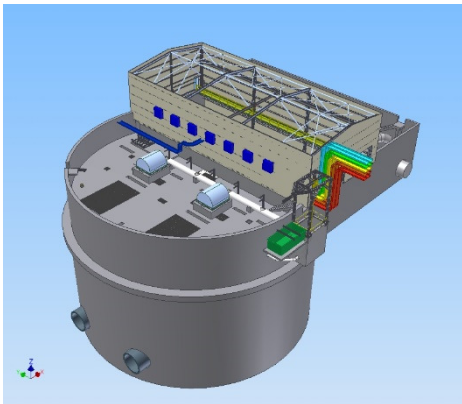


## Sea Water Intake Pumping Station





# Sea Water Intake Pumping Station



The intake is designed to work with 6 pumps in operation one in standby total 7 pumps, rated capacity 8400 m<sup>3</sup>/hr per pump.

Coarse filtration of fish and barnacles.





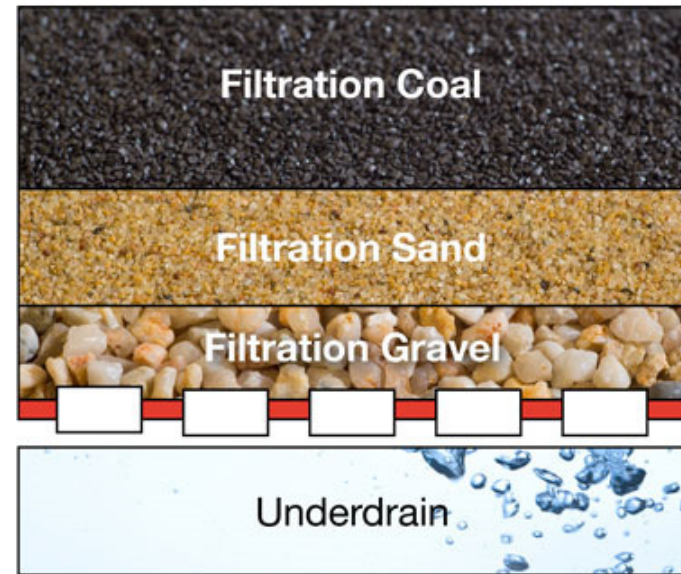
# General View of the Facility



## Pre-treatment



# Pre-treatment



DUAL-MEDIA

The pretreatment consists of 24 X 2 dual media filter compartments and 24 X 2 20 $\mu$  cartridge filters.





# General View of the Facility



## RO 1<sup>st</sup> Pass - SWRO



# General View of the Facility



## RO 2<sup>nd</sup> Pass - BWRO





# SWRO and BWRO

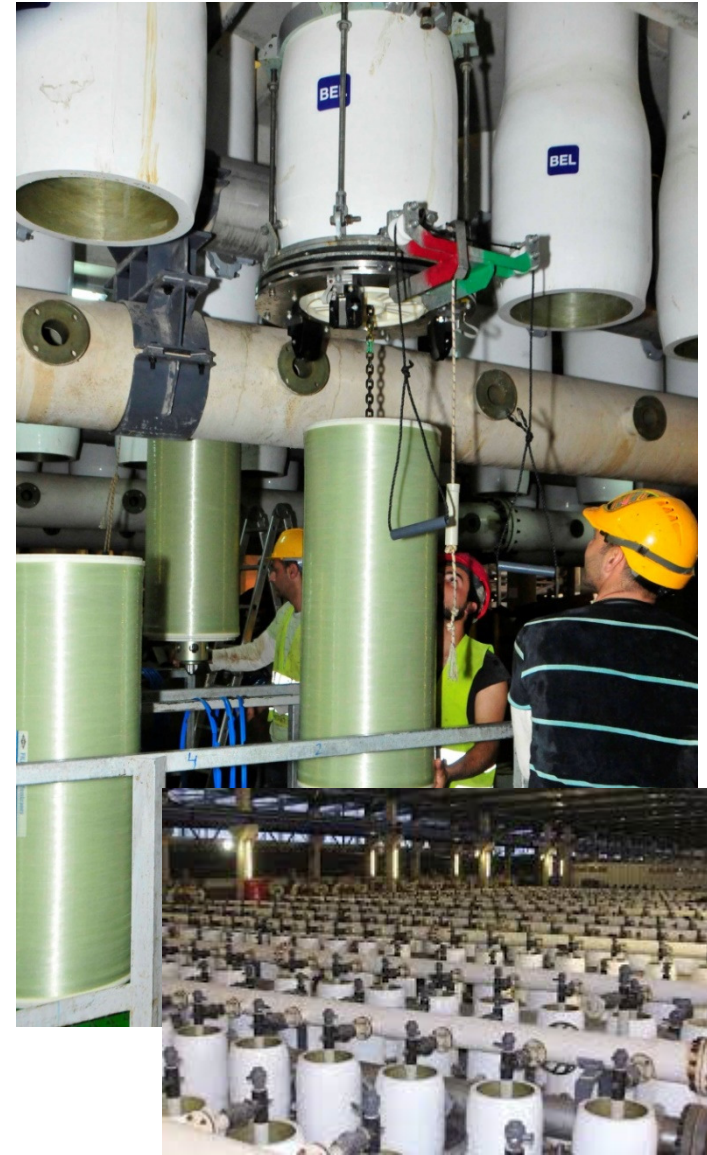


Unique concept of vertical 16" PVs and membranes.

A total of 16,400 membranes.

1<sup>st</sup> pass - 45-50%, up to 75 bar.

2<sup>nd</sup> pass - 95%, up to 20 bar.





# Energy Recovery



Dual Work Exchanger Energy Recovery

Recovery of 97% of brine pressure energy.



# General View of the Facility

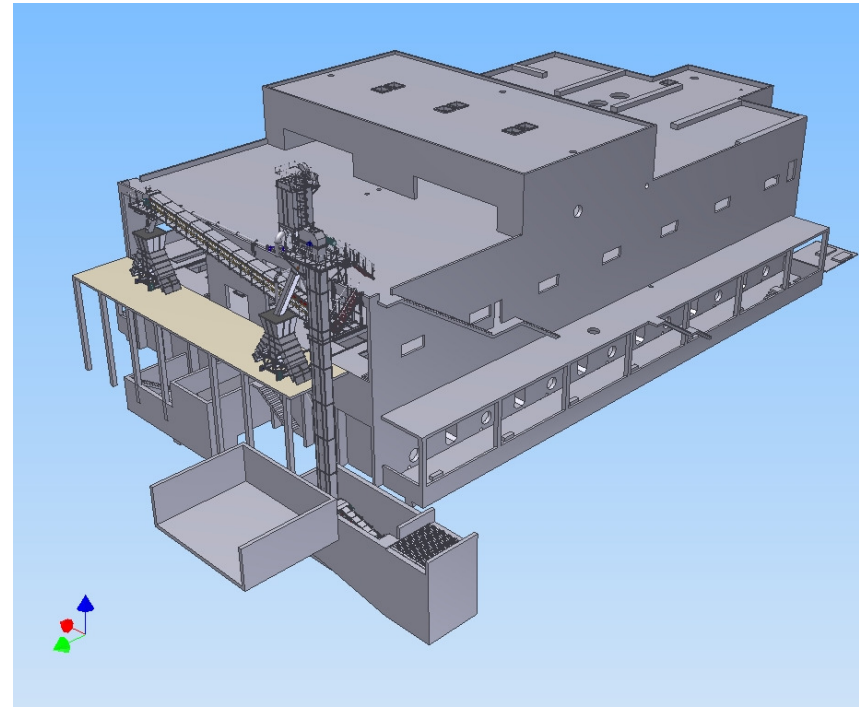


## Post-treatment and Product





# Post-treatment



Remineralization with calcite bed reactor.

The reaction is stimulated by Carbon Dioxide and Sulfuric Acid.

Adjustment of pH and Chlorination.



# Environmental Awareness



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**Thank you!**





# General View of the Facility

