ASK THE EXPERTS

Resilience to the global freshwater crisis: Desalination of salt and brackish water for drinking water supply

30.08.2022

Membrane Technologies in Water Desalination

the role of renewable energies and the future of Zero Liquid Discharge (ZLD)

Case Study of PWT Esenguly Desalination Project

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PWT Wasser- und Abwassertechnik

- Headquarter: Zwingenberg, 64673 Germany
- EPC + Operator in Europe, North Africa and Middle east

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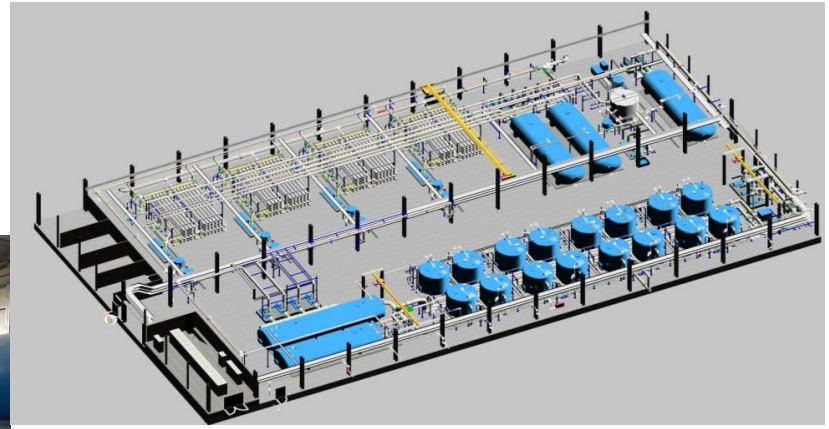
Membrane technologies in water desalination and the role of renewable energies and energy recovery techniques.

Integrated Water Transfer and Desalination Project in arid region

Location: Esenguly Turkmenistan

Capacity: 20,000 m^3/d

Time (year): 2018



Initial challenge

- Economical solution to water intake
- Construction of pumping station & pipe construction for sea water delivery
- Energy availability and cost
- Pipe and infrastructure protection from storms, flood, human intrusion and destruction.

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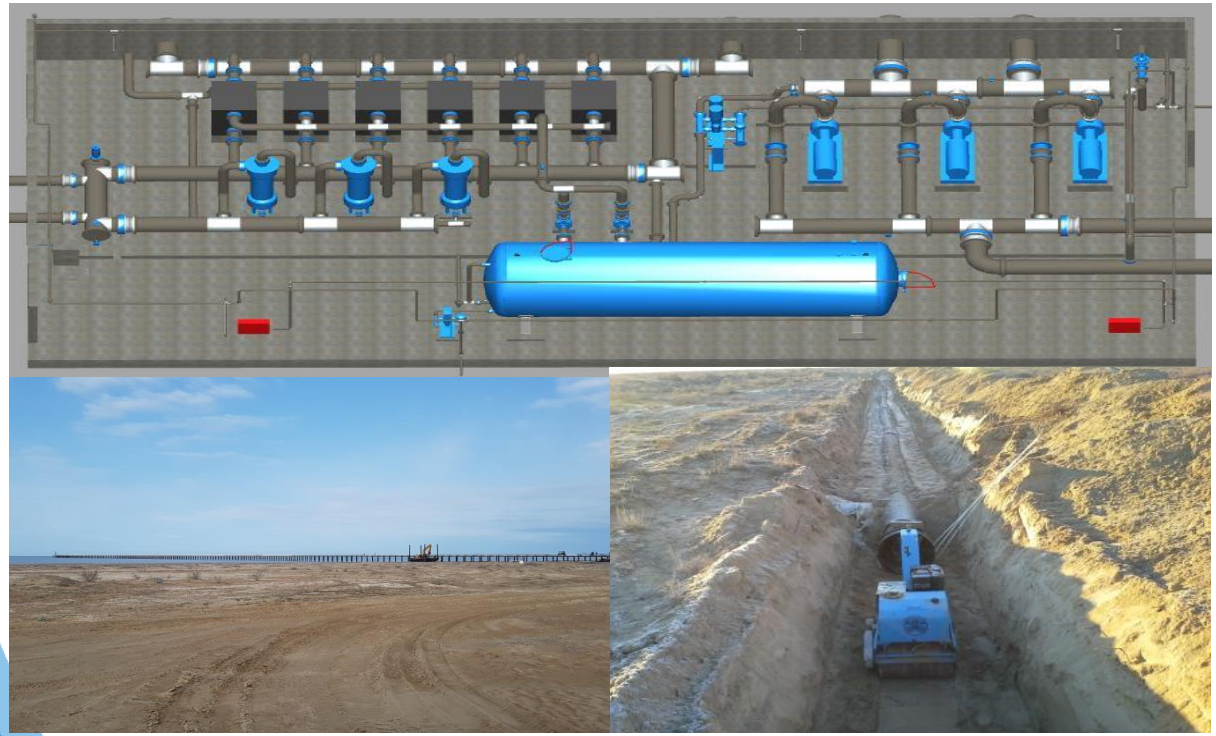
Initial challenge

Intake, pumping station & pipe construction



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Solution deployed

- Solutions to long distant water Intake:

  i. use of water from various local sources like well, lakes and rivers



Solution deployed

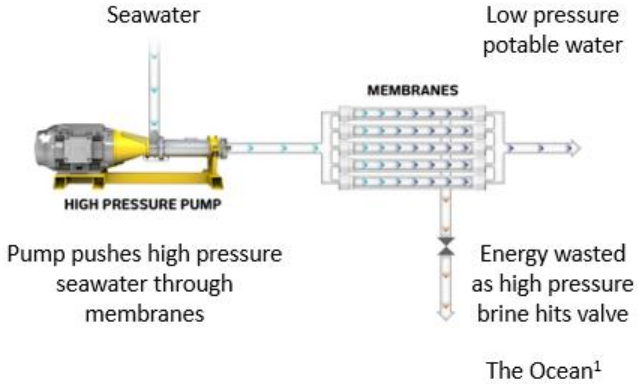
- Solutions to the energy issues:

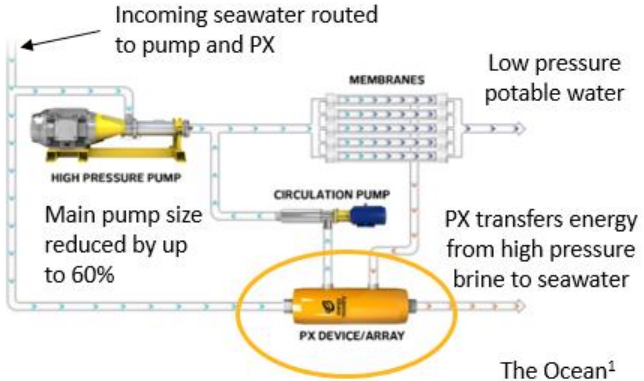
  i. Solar powered containerized desalination units

Solution deployed

- Solutions to the energy issues:

  i. Energy Recovery Devices (ERD) – Pressure exchanger (PX)





Source : ERI

Results obtained

- Strong reduction in the capital and operation expenditures
- Cheap and clean drinking water to the rural communities
- With Pressure Exchanger = Energy recycled, up to 60% decrease in energy use

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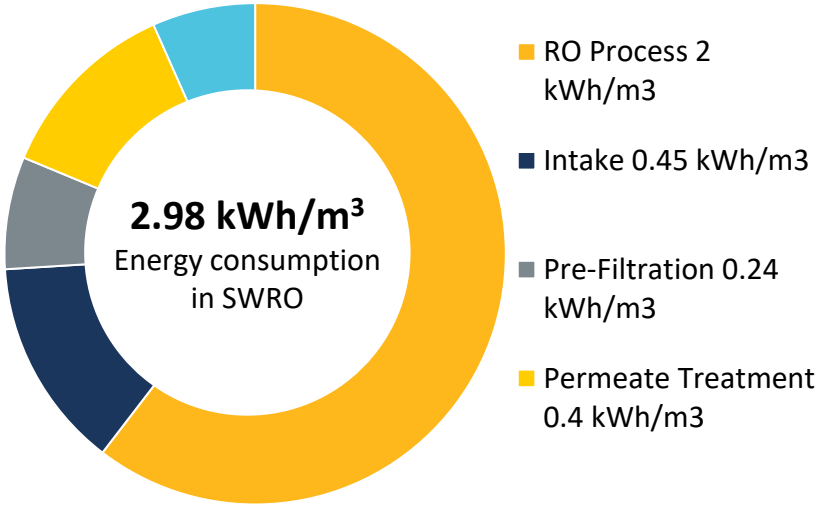
Results obtained

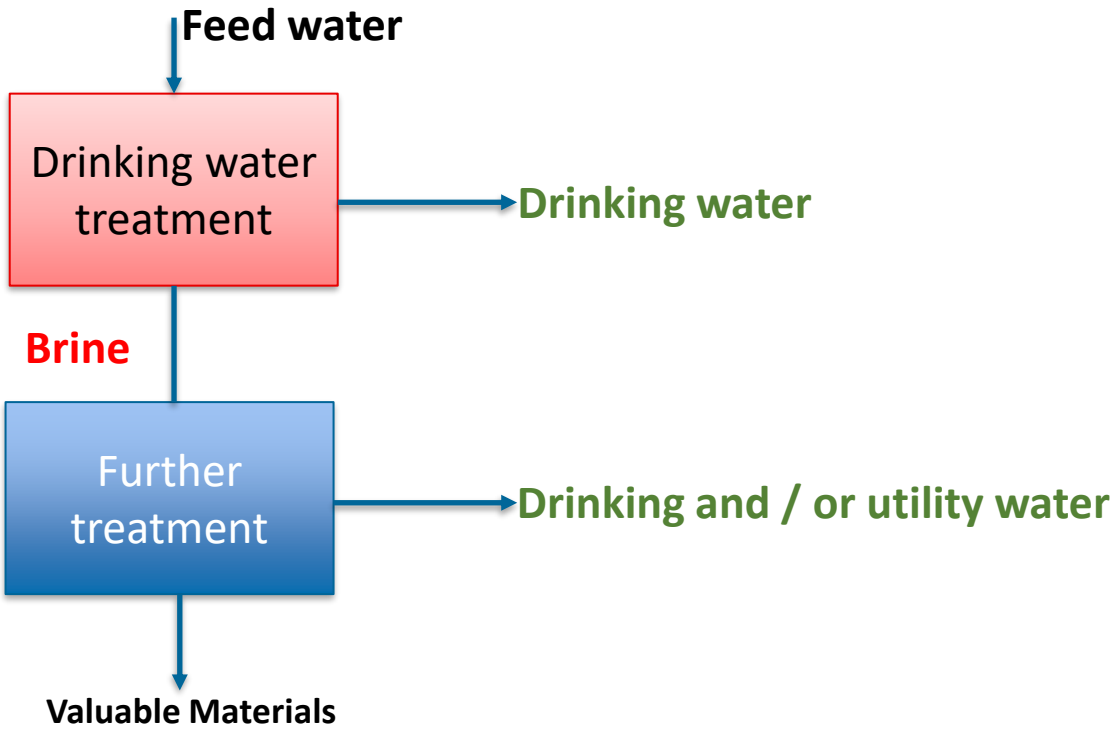
Energy consumption per process



- RO: the most energy intensive process within the BWRO treatment plant
- Up to 60% energy need reduction with PX;
- a critical component to achieving 2 kWh/m³
- with 1% of overall plant CAPEX.

Source : ERI

Brine recycling and the future of zero liquid discharge



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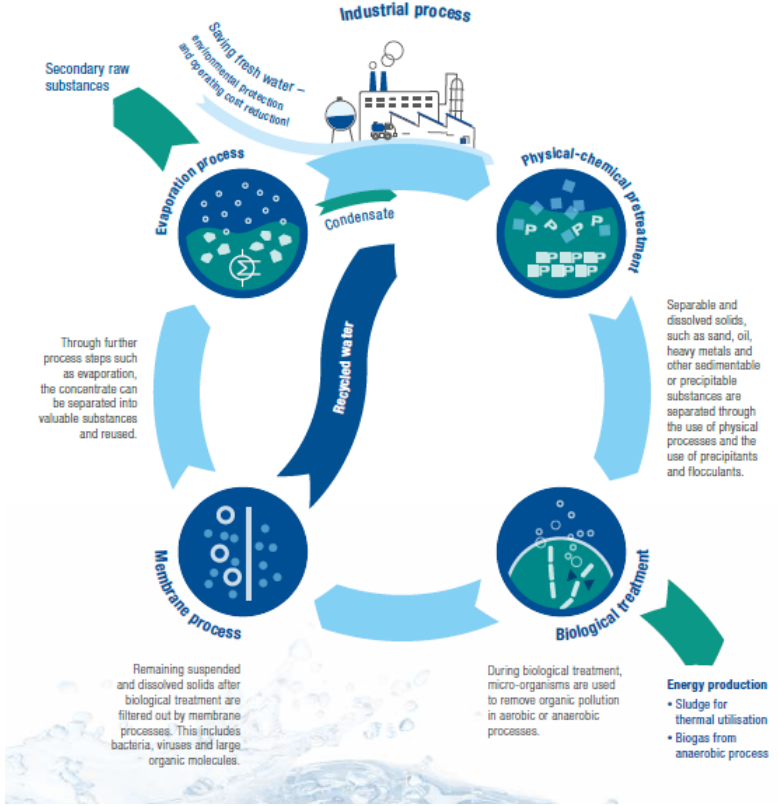
Brine recycling and the future of zero liquid discharge



Conclusion

RO Desalination process overview

Thank you for your attention!

Any Question?

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