

# ***Disruptive Technologies & Solutions for Wastewater Treatment and Recycle***

**Presented by -**

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**BUH-Roserve Enviro Pvt. Ltd.**



# Company at a Glance

<http://roserve.in/>

Roserve provides a comprehensive fleet of clean technology equipment to diverse industries by offering financial solutions including but not limited to renting, leasing and pay-per-use models under an innovative Wastewater as a Service (WaaS) concept.

## Company highlights

**3 months to 10 years**  
Lease duration range

**18-22% of Capex value**  
Average annual lease payment

**10+**  
Industries Served Globally

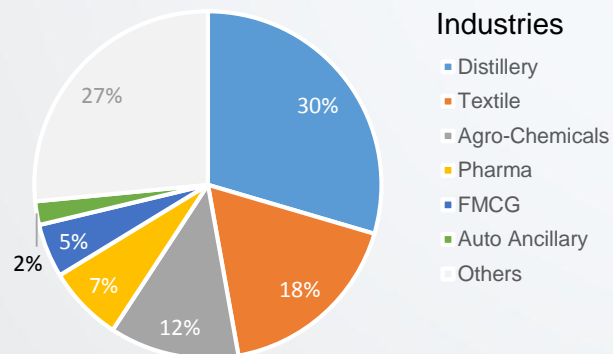
**65+**  
Plant Installations Presently

**~40%**  
Savings generated over 6 years through recycling

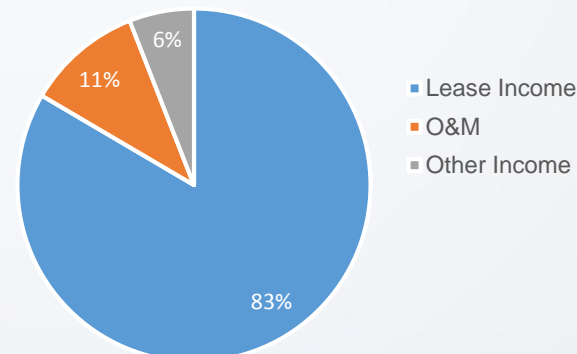
- ❑ Roserve is a joint venture which was incorporated in 2016 between Concord Enviro Systems Ltd and Danish Climate Investment Fund with an objective of providing a blend of advanced technology and financial solutions which helps in:
  - ✓ Achieving sustainability by tendering re-use and re-cycle solutions across industries
  - ✓ Enhancing unit economics via affordable financial solutions
  - ✓ Providing security and maintenance for the entire manufacturing setup & infrastructure support round the clock
- ❑ Given the lack of a public, centralized wastewater treatment services within India, companies across all industries need a solution that doesn't involve a substantial Capex investment
- ❑ Presently operating in the water management space, Roserve has a unique ability to provide water security by offering best in class technology like ZLD and MBR at lower upfront cost, insulate clients from technology risks and obviate capex requirements
- ❑ The company works on a "WET" Lease model which helps businesses procure the machinery coupled with provision of operational support including but not limited to performing maintenance, managing operations and procuring materials, insurance or any such requirements
- ❑ Roserve is headquartered in Mumbai, India with Roserve FZE acting as its subsidiary in UAE to cater to its international contracts



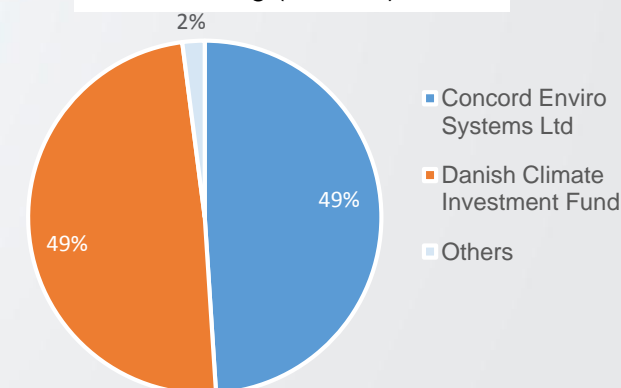
Revenue breakdown (FY2023)



Business Segments



Shareholding (FY2023)





1991

**MEMBRANE &  
WASTE WATER DIV.**

1999

**SOLID WASTE TO  
ENERGY**



2016

**WaaS/PAY PER USE  
MODEL**



2009  
(1984)

**EFFLUENT & SEWAGE  
TREATMENT**

**A DIVERSIFIED WASTE MANAGEMENT GROUP**

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# ***Disruptive Technologies & Solutions for Wastewater Treatment and Recycle***

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**In the context of wastewater management, disruptive solutions and technologies are those that bring about substantial improvements, efficiencies, and novel solutions to address challenges associated with treating, reusing, and managing wastewater.**

# Contents

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01 | **Wastewater Reuse & Recycling**



02 | **Disruptive Solutions & Technologies**



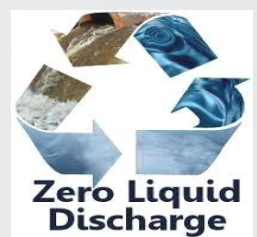
03 | **Challenges & Barriers**



04 | **Case Studies**



05 | **Zero Liquid Discharge**





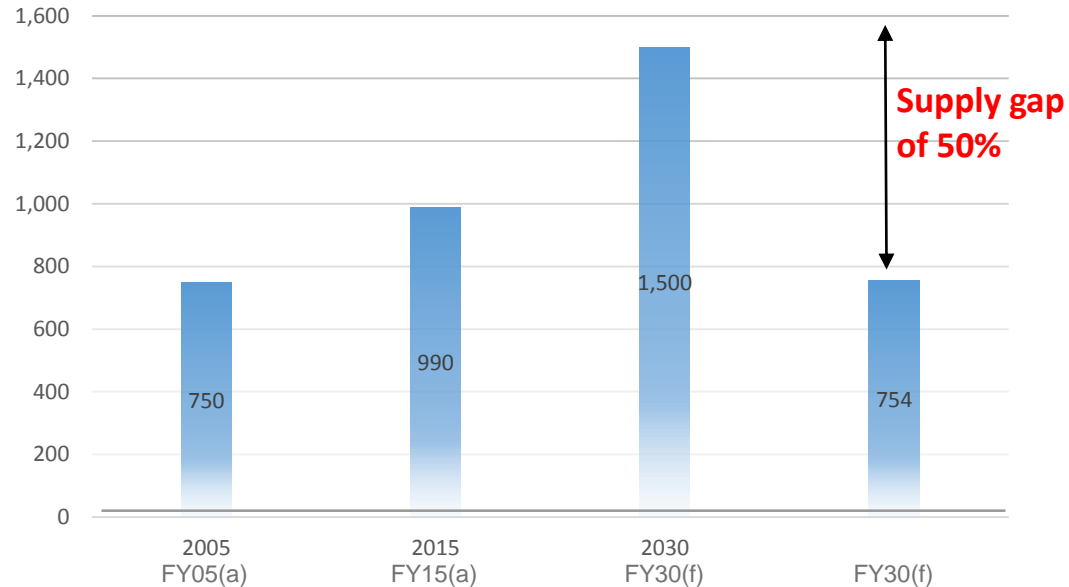
# 01

## Wastewater Reuse & Recycling

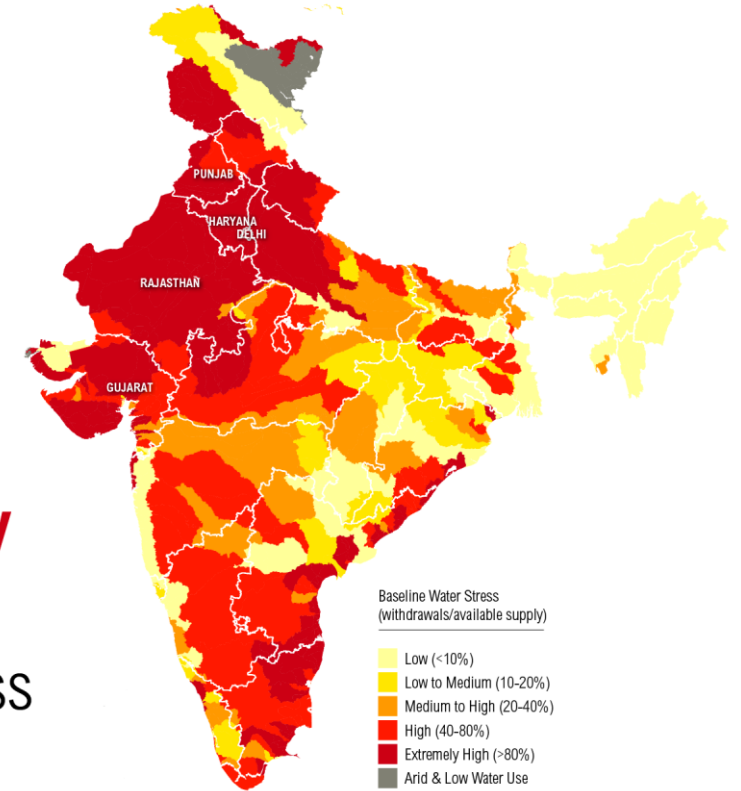
### Need for Recycling..

By 2030, India will have less than half of the total demand for water. As per a [NITI Aayog report](#), by then India will be able to supply 744 billion cubic meters of water against a demand for 1,498 billion cubic meters — **a shortfall of over 50 percent.**

- By CNBCTV18.com Jun 3, 2022



**54%**  
of India  
Faces  
**High to  
Extremely  
High**  
Water Stress



# Need For Wastewater Recycling

Wastewater recycling helps to preserve aquatic life and biodiversity by reducing polluting discharges into surface water. These discharges have major economic repercussions and negative impacts on the environment since they make any kind of normal activity impossible in the contaminated zone for a long time afterwards.

Increasing Water Scarcity

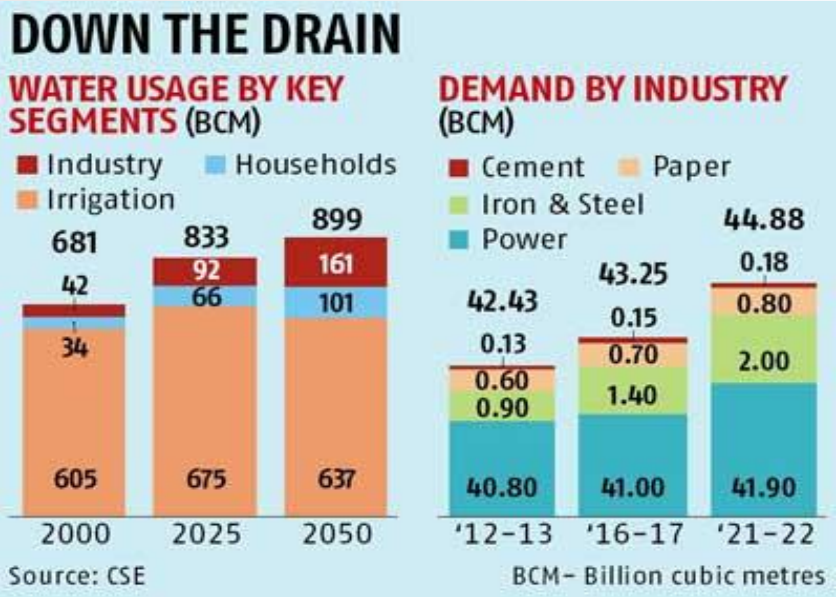
Expensive nature of Conventional treatment

High Purity Water Requirement

Strict Government Regulations

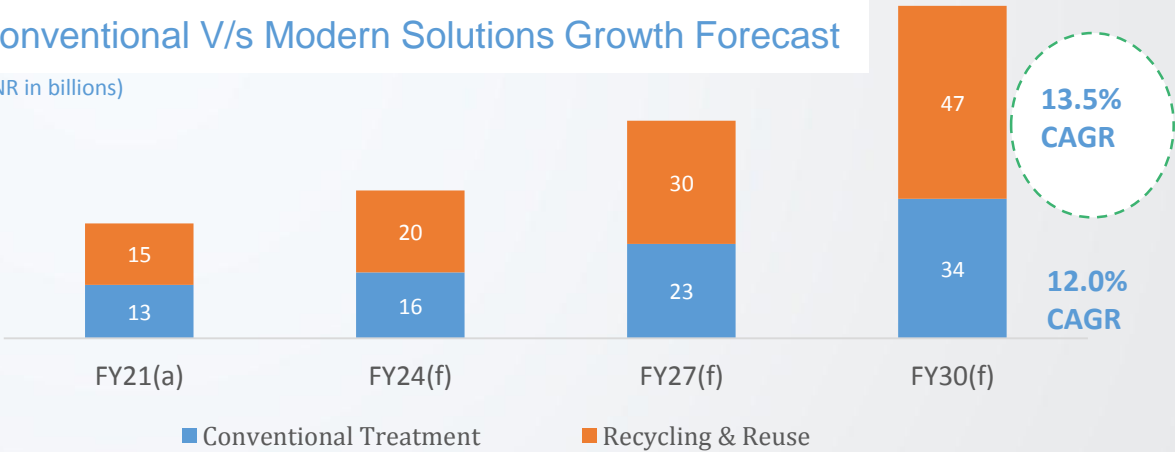
Improvement in Technology

Increasing focus on Environment & SDG Goals



Conventional V/s Modern Solutions Growth Forecast

(INR in billions)



Increasing demand for recycling solutions augur well for Roserve enviro

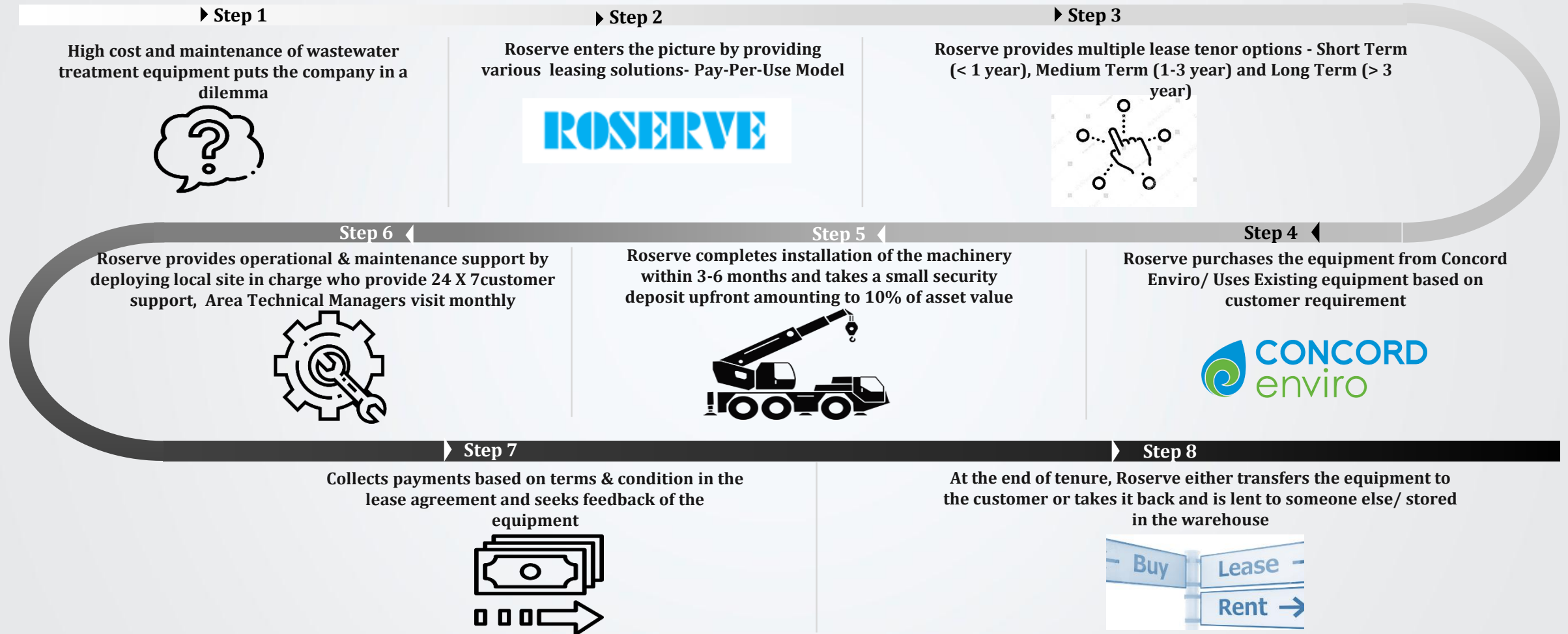
**01 | Financial Solutions**

**02 | Technologies for  
Recycling Wastewater**



# Wastewater as a Service (WaaS)

- Roserve provides a complete end to end solution to its customers which starts right from financing the equipment to providing maintenance services and taking care of the transfer and disposal of equipment towards the end of contract



# Financial Solutions

Wastewater as a service (WaaS) is becoming an increasingly desirable option for customers who wish to expend Opex rather than Capex on their water treatment requirements and Roserve caters to these needs by offering various financial solutions based on size and needs of the business

## Customised Solutions on Offer

### Different Billing Models



#### Pay-Per-Use Model

Client pays Roserve based on the quantity of permeate generated post treatment



#### Fixed Rental Plan

Irrespective of the quantity of water recycled the client pays Roserve a Fixed Rental per month



#### Sale & Leaseback Model

The owner of an asset sells the asset to Roserve and then leases it back, thus saving an upfront capex

### Multiple Tenor Options

#### Short Term

Equipment is given at lease for less than 1 year

#### Medium Term

Equipment is given at lease for more than 1 year but less than 3 year

#### Long Term

Equipment is given at lease in the time frame of greater than 3 years

### Flexible Renewal & Disposal Options



#### Transfer at the end of tenor

The equipment is transferred to the client at the end of the lease period against the Security Deposit



#### Return at end of tenor

The equipment is returned at the end of lease contract and security deposit is refunded



#### Secondary Lease

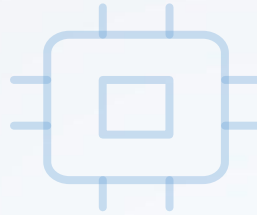
The client renews the lease with Roserve post the completion of the primary lease tenor

# ***Technological Solutions***

## **Compact ETP & STP Skid based Treatment system**

ASP or Advanced MBR Technology

Less Footprint Area and Civil work



## **PTRO systems**

**Recycling Effluent upto 97%**

Polishing RO to Match treated effluent quality



## **Innovative Evaporation Technology**

**Vaccum operation**

Optimum Operation with high Thermal economy



# Challenges & Barriers

*Addressing these challenges requires a multidisciplinary approach involving technological innovations, policy reforms, public education, and collaboration among stakeholders to ensure sustainable and effective wastewater treatment practices.*

*Ageing Infrastructure*

*Limited Access to Clean Water*

*Energy Consumption*

*Chemical and Industrial Pollution*

*Emerging Contaminants*



*Lack of Skilled Workforce*

*Regulatory Compliance*

*Sludge Management*

*Health and Safety Concern*

*Nutrient Pollution*





# Case Study of Automobile Industry - Maharashtra

## *Recycling Treated Sewage effluent for Utilities Applications*

### **Previous Scenario -**

The client has existing manufacturing facility in the heart of Mumbai and using BMC water for their process applications as well as for the domestic purposes which costs for Rs. 104/KL.

The average sewage generation is 3,00,000 liters per day (300 KLD) which is drained after the treatment.

### **Current parameters -**

Roserve Enviro proposed the recycling of the sewage effluent for utilities application by installing a recycling system on DBOOT basis. The Packaged RO system is commissioned in June 2021 and recycling min. 70% of feed for Industrial applications by matching the required treated water parameters.

|           | Feed    | Permeate | Reject  |
|-----------|---------|----------|---------|
| Quantity  | 300     | 210      | 90      |
| pH        | 6.5-7.5 | 7-7.5    | 6.5-7.5 |
| TDS (PPM) | 450     | <50      | <2000   |
| TSS (PPM) | 20      | Nil      | < 20    |
| COD (PPM) | 100     | <10      | <250    |
| BOD (PPM) | <25     | BDL      | <70     |

### **Savings -**

- 1. Recycled water replaces fresh water consumption**
- 2. Drain water quantity reduced, cost of disposal reduced**

# Case Study for Textiles Industry - Tamil Nadu

## Reducing the Evaporation feed by High Pressure RO system

### Previous Scenario -

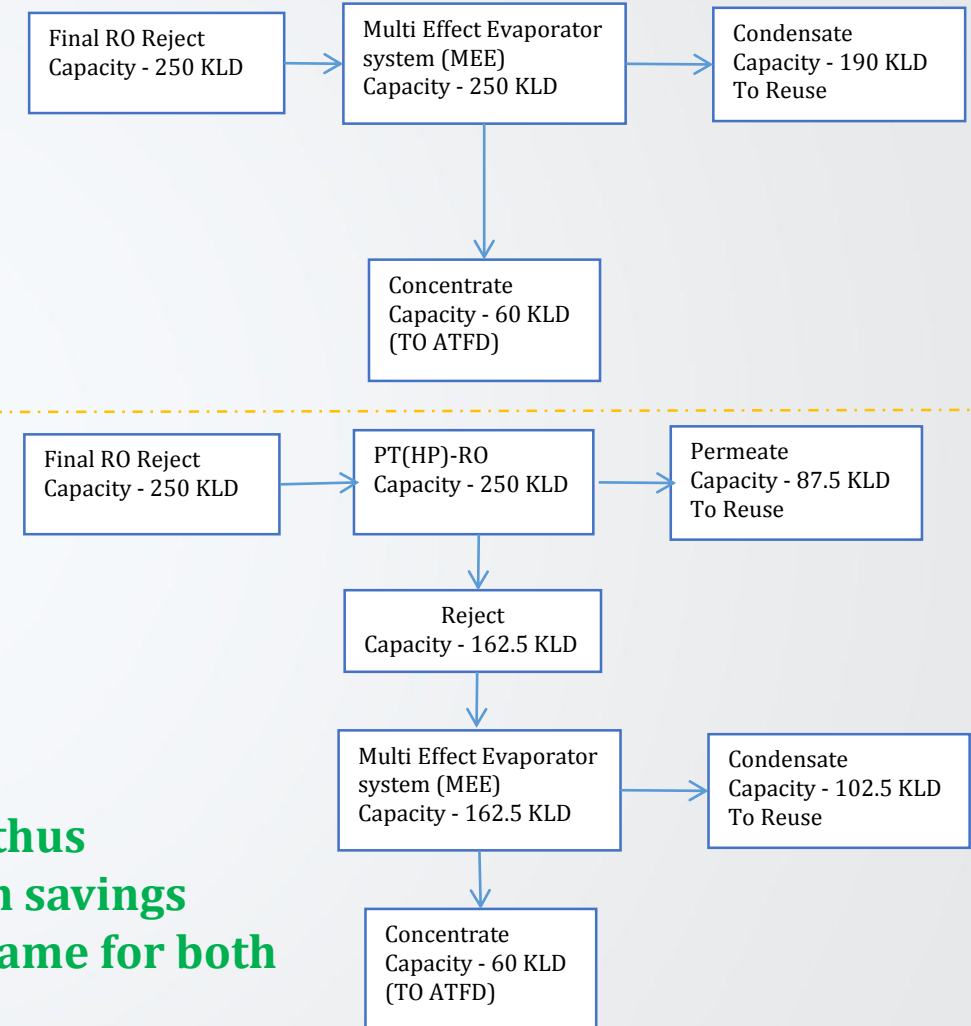
The process effluent treated & recycled by ETP followed by multistage RO system followed by Multi Effect Evaporator & ATFD.

**The** final RO reject of 250 KLD of 75,000 TDS is feed to MEE system

### Current parameters -

Roserve Enviro proposed a sustainable option infront of the existing MEE system by concentrating the feed TDS using High Pressure RO system.

The operational cost of the RO system is <25% of the MEE with less maintenance.

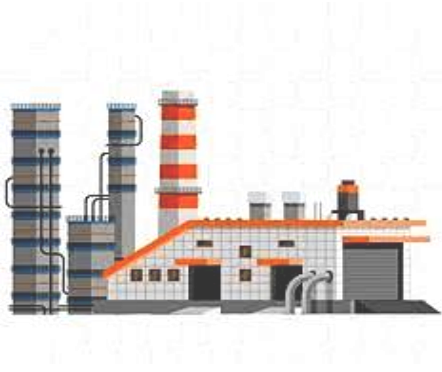


### Savings -

By incorporating PT (HP)-RO, the load on MEE is reduced by 35% thus reducing steam consumption for MEE significantly. The total steam savings because of this is 21.9 ton/day. The power consumption remains same for both the options

05

# ZLD in 4 STEPS



**Industries**



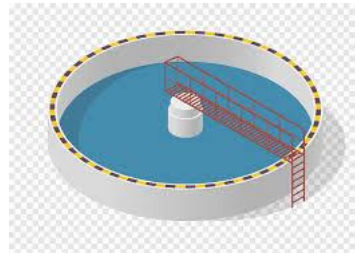
**Physio - Chemical Treatment**



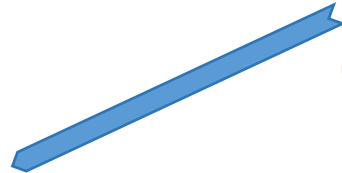
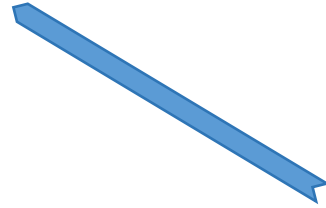
**Membrane Filtration (RO)**



**Evaporation Systems**



**Treated water for recycling**



# Total Zero Liquid Discharge Solutions

## Effluent Pre-treatment

HRSCC



DAF

## Evaporation



WHE

ATFD



MEE

## Effluent / Sewage Treatment



Anaerobic -  
SMAG & UASB  
technology



Aerobic  
treatment

## Reverse Osmosis System

Spiral+ RO



Plug n play module



Low / Medium / High Pressure RO

**ONE  
STOP**



# Total Zero Liquid Discharge Solutions



**Chemical**



**Distillery**



**Starch**



**Cement**



**Tanneries**



**Marine**



**Steel**



**Food & Beverages**



**Pharmaceutical**



**Textile**



**Paint & Pigments**



**Automobile**

**... & many  
more !!**



# Thank You

**Let us join hands to**



- **Achieve Zero Liquid Discharge**
- **Conserve large quantity of water**
- **Reduce energy consumption**
- **Save on Capex**
- **Preserve the environment**

**Contact us**

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**Leading to a sustainable & green future for our coming generations.**

