



Membrane Bioreactor  
Desalination Technology

# Seawater Desalination (DSW)

for  
Potable Water  
Production,  
Residential and  
Industrial Water





A vertical strip on the left side of the page shows a close-up of industrial water filtration equipment, including white cylindrical membrane modules and black piping with various fittings.

# Our Profile

TFE is a leading technology management company in Malaysia. TFE started its journey in 1994 by introducing innovative water technology for human, health and industries. At beginning the main focus was on demineralization (DMW) process with high requirement for food processing and pharmaceutical industries. TFE is well-known for its cost-effective, updated, patent protected and award winning high efficiency technologies. It has history of 100% success rate (Zero failure).

To stay ahead of changing times and fast paced technological development, TFE changed its name from Techno-Food group to TFE Global representing its more global outlook and presence. The primary operating subsidiary has been rebranded to TFE Water Systems to reflect industry specialization.

Over the past few years, TFE has advanced tremendously and successfully introduced new products like Desalination (DSW) and green technology for Industrial Waste Water Recycling (IWWR) by using TFE membrane technology. Membrane Bioreactors (MBR) are used for resource recovery from waste stream, membrane separation for fresh water and desalination of industrial and municipal waste water. To reduce energy consumption, TFE has developed technology for energy recovery and micro hydro turbine for operating small scale desalination plants.

TFE Water Systems is dedicated to conducting research, product development, plant design, manufacturing and providing fully automatic custom made plants for industrial process water. TFE currently has research collaboration with a few universities and laboratories, aiming to develop and transfer technology. TFE is always at the forefront of technology with the ability to offer competitive services to contribute in achieving economic and environmental sustainability by mitigating the future global water and energy crisis.

/// Pioneering Cost-Effective Sustainable Water Technologies ///

# Desalination Membrane Process (DSW)

TFE introduced patent protected Hybrid membrane desalination process for producing quality potable water at cheaper cost in its Seawater Desalination Plants (DSW). Membrane bioreactor based potable water production is highly energy efficient compared to convention desalination process. TFE's desalination is proved to be economical and environment sustainable.

## Key Features

- Patent Protected
- Membrane bioreactor based process
- Recovery Rate > 50%
- Operating Reliability > 90%
- Energy Consumption 30% lower than traditional desalination
- Embedded Energy saving equipment
- High Energy Efficiency
- Skid mounting saves space and installation cost.
- 24/7 Operation

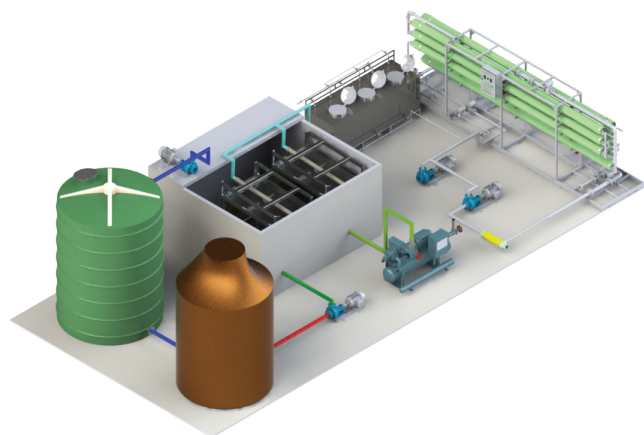
## Typical Applications

- Potable Water
- Bottled Water
- Industrial and residential use
- Power Generation
- Refineries
- Offshore platforms
- Any use that requires low dissolved solids.

## High fouling resistance

Plant is developed to operate at minimum membrane fouling of:

- Particle fouling
- Natural organic salt fouling
- Oxidant fouling
- Biofilm fouling
- Suspended solid fouling
- Sand Fouling



Plant Scale	Capacity (m <sup>3</sup> /day)	Supports
Small	20 to 100	200 to 500 people.
Medium	100 to 500	500 to 5000 people.
Large	Up to any capacity	Up to any size

# TFE Energy



## Solar

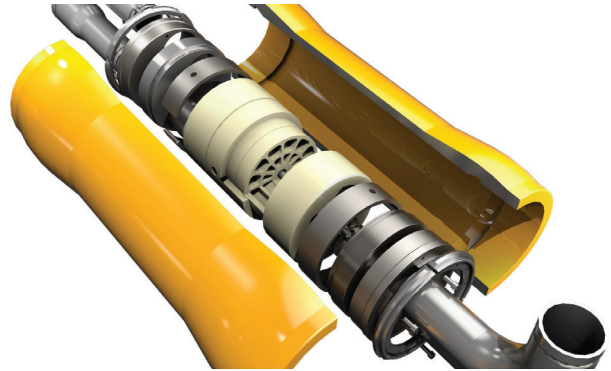
Integrating solar energy into Desalination plant (DSW) is part of TFE's effort towards the use of renewable energy for a sustainable future. Solar energy is indefinitely renewable, low maintenance, has no impact by mechanical failure, low noise and has no carbon footprint.

PV modules are used to extract energy from solar radiation and to convert solar energy directly into electrical energy and finally electrical energy is connected to desalination plant.

2 kW to 5 kW modules for main supply for for assisting grid/generator.

## Energy Recovery Device

Efficient and reliable energy recovery solution with 98% efficiency. Completely scalable for any capacity plant. Lowest lifecycle maintenance energy recovery device



## Micro Hydro Turbine

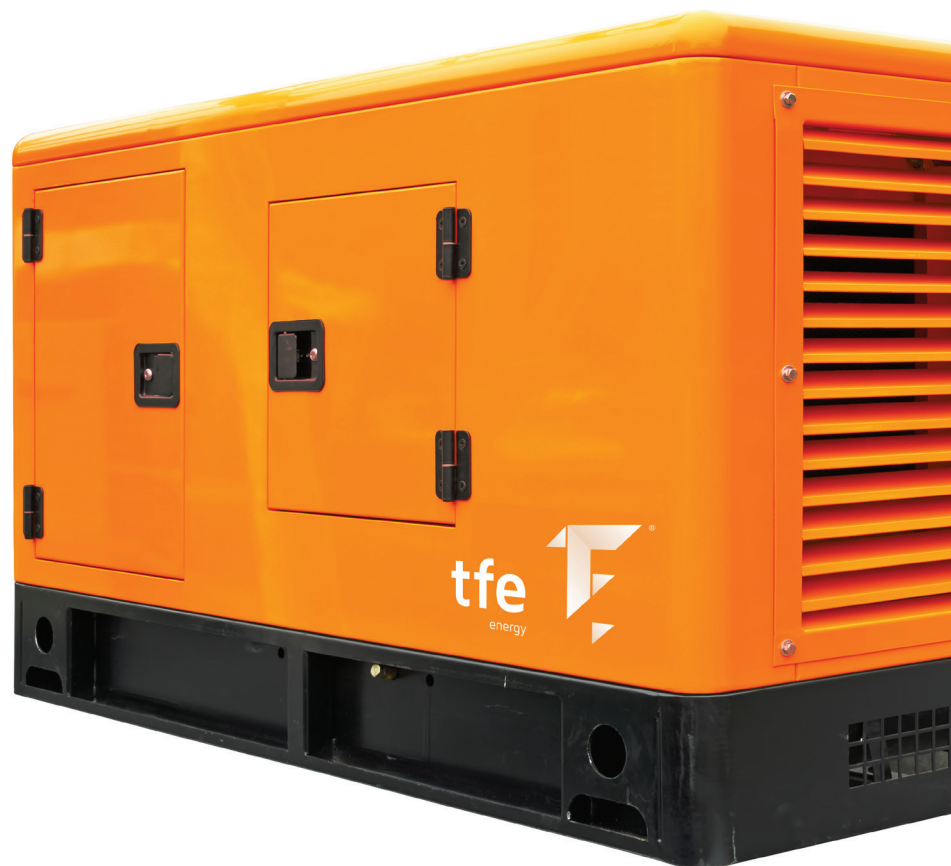
TFE's patented micro hydro turbine is one the most efficient currently available in the market. It's remarkable low rpm performance makes it stand out, as it can generate electricity in low velocity streams as well as in turbulent water bodies.

The micro hydro turbine system can be used for main supply and for assisting grid/generator depending on the water velocity and other conditions.

## Generator

TFE Diesel generators are a result of a productive long standing industrial collaboration and R&D. The use of the latest technology and the most updated production systems have resulted in fully automatic silent and efficient generators. TFE Generators use only the leading industrial engines from the likes of Cummins™ and Perkins™.

Various capacities available. Can be used both as main supply and for assisting grid.



# Technical Feature of TFE-DSW Plant

Suitable for both sea and brackish water. Plants are skid mounted that save installation space, investment and installation time.

## Operations and Performance

- Designed and built to meet WHO standard water quality.
- MBR technology allows processing of highly turbid water.
- The output water is sanitized with approved chlorine dosing rate.
- Energy recovery unit reduces energy consumption.
- Brine dilute system reduces ionic strength of brine before disposal.

## Operating Feature

- Operating pressure range 300 psi to 800 psi (depends on salt concentration)
- Completely Automated Machine
- Water recovery Range: 40% to 60%.
- Device with more than 90% is used to reduce energy consumption.
- Skid mounted plant that reduces installation space and time.
- Low energy consumption and less chemical use makes it environment friendly.

## Pretreatment

to remove suspended solid and sand from water. TFE is experienced with bioreactor which needs small installation area and lower energy consumption. TFE's MBR is a proven equipment for reducing bio film and particle founding.

## High pressure pump

to feed saline water into the desalination process associated with booster pump for energy recovery system.

## Energy recovery

system to save wasted energy from brine water.

## Membrane pack

with pressure vessel.

## Cleaning in Place (CIP) and descaling

equipment for membrane cleaning.

## Brine tank

for collecting concentrated salts.

## Fresh water

buffer tank.

## Control Panel

with complete instrumentation for production process operation. The main instruments are Flow meter, TDS meter for measuring salts, pressure safety valves and pressure gauges.



# The TFE Promise

Custom Tailored solution by leading expert  
Fully automated custom built machine  
Fast delivery & Installation  
After Sales Service\*  
Warranty 3 Years\*  
Machine life cycle 15 years\*

\*Terms and conditions apply



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