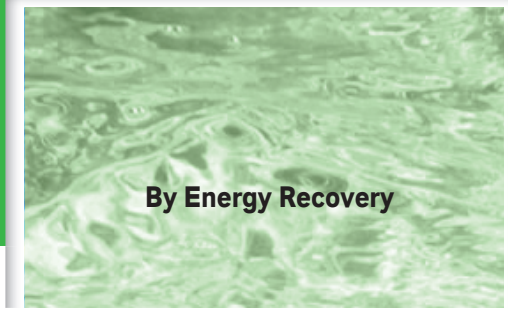
PX TECHNOLOGY SERVING AFFORDABLE SOLUTION TO MINJUR PLANT



By dramatically reducing energy consumption and costs, the PX devices enable the Chennai plant to produce drinking water at just over USD 1 per 1,000 liters.

PX technology in Chennai allows affordable quality drinking water solutions for many seawater desalination using the reverse osmosis process is now the least expensive, most environmentally friendly desalination method available today, and is increasingly employed to alleviate water shortages. Advancements in membrane technology, as well as improvements in pump efficiency, have helped make seawater reverse osmosis (SWRO) a viable alternative to traditional thermal methods. However, the most significant advancement in recent years, making membrane based desalination a truly cost-effective technology has been the introduction of isobaric Energy Recovery systems, such as the Energy Recovery Inc PX pressure exchanger device, which consistently achieves real energy transfer efficiencies—up to 98 percent, making it the most efficient Energy Recovery device available.

Challenge: A Flourishing Seaside City Ridden with Water Woes

With a metropolitan population of 6.5 million in 2001 and growing, Chennai is the fourth most populous metropolitan area in India. Historically dependent upon water resources from the Red Hills, Sholavaram and Chembarambakkam lakes that reside up to 40 km away from the city, the people of Chennai must pay high transportation costs for the hundreds of water tanker trucks that make dozens of daily trips to bring emergency water to its residents. Each truck carries a capacity of 12 m^3, enough to satisfy the basic daily survival needs of only 240 people.

The cost of transporting such water has been steadily increasing as a result of rising global fuel prices. Meanwhile, the lakes that supply the city's water have been decreasing drastically in volume over the last five years due to the augmenting metropolitan population and the dwindling seasonal rains of the north-east monsoons that fill the lakes. ☞ **www.energyrecovery.com**

The people of Chennai were desperately in need of an alternative to their standard unsustainable water resources.

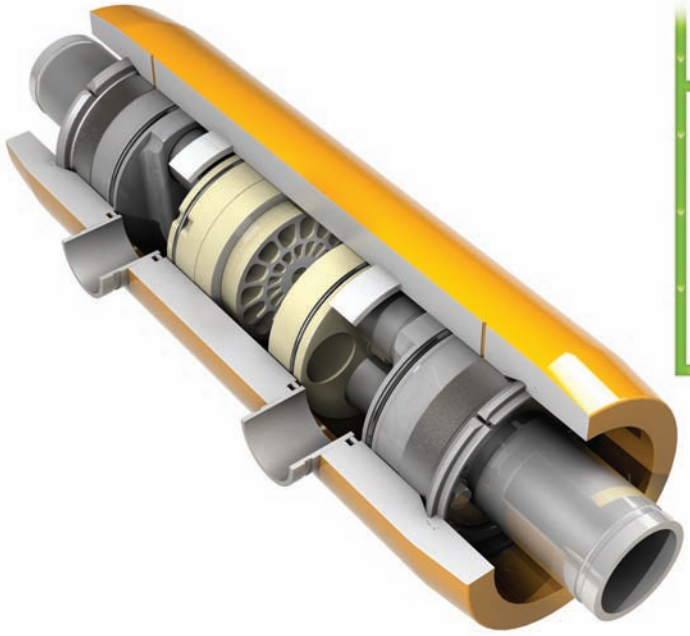
Solution: Taking the Salt Out

In 2007, the water governing body of Chennai, Metropolitan Water Supply and Sewerage Board (CMWSSB) contracted Befesa Construccion y Tecnologia Ambiental (Befesa CTA) to begin construction on what would be Chennai's largest desalination plant. Under the agreement, Befesa would design, build, own, and operate the USD 140 million Minjur plant for 25 years. The plant, located near Minjur just north of Chennai, will process 237 million liters of sea water per day, supplying 100,000 m^3 day (100 MLD) of desalinated water to the region to significantly augment its current water supply. Chennai also has five smaller reverse osmosis plants located at Nochikuppam, Kasimedu, Kasimedukuppam, Ayothiakuppam and Velacherry, contributing to the local water needs of specific areas.

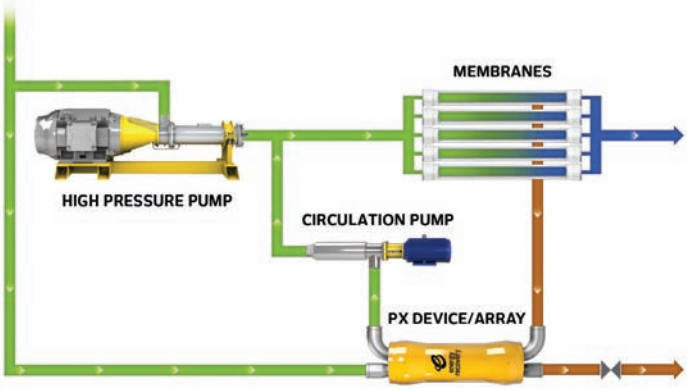
In efforts to produce economically viable water and uphold environmental standards, Befesa implemented Energy Recovery's advanced PX technology into the plant. They choose Energy Recovery's devices due to their high efficiency, low overall lifecycle cost, reliability, industry credibility, and also based on Energy Recovery's commitment to customer service.

Energy Recovery's PX ERDs operate at up to 98 percent efficiency and reduce the energy consumption of seawater desalination systems by up to 60 percent, making it a cost-effective solution for clean water supply. At the core of the PX device is a single moving rotor made of tough engineered ceramic that is unaffected by chemicals, will not corrode, and requires no periodic maintenance. Single devices are used in relatively small RO trains, while multiple isobaric ERDs are connected by manifolds to run in parallel to serve large trains.

Energy Recovery's PX technology also helps reduce the carbon footprint of desalination, saving more than 900 MW of energy and reducing CO_2 emissions by more than 4.7 million



Internal View of Energy Recovery Inc PX Device



RO Process – With PX® Energy Recovery Devices

tons per year worldwide. More than 10,000 PX devices are deployed or under contract to be installed at desalination plants across the globe. Befesa has continued using Energy Recovery's PX technology in global desalination plants.

"We have been using Energy Recovery's PX technology in many of our plants as it is clearly providing competitive advantages in the market," said Carlos Cosin, International Director, Befesa. "More importantly, desalination is playing a vital role in providing reliable water at much lower cost that populations desperately need."

The Chennai plant was built with five trains containing 23 PX devices each and began producing water in July 2009. As the plant originally ran on a temporary intake system, only one of the trains was able to be utilized. In August 2010, however, the equipment was upgraded to a permanent intake system, running four trains and reserving the remaining train for backup.

After undergoing the desalination process, the fresh water is transported through pipelines to the city water tank, from which it is distributed through the city's water infrastructure to individual residences.

In addition, to ensure that the brine from desalination is disposed of in an environmentally friendly manner, it is diluted with pure treated water before being discharged back into the sea, so the salinity does not disrupt natural habitats.

Result: Affordable, Potable Water for Drinking and Prosperity

Energy Recovery's innovative PX technology allows Chennai quality drinking water by providing an affordable solution for many, including low income and disadvantaged groups. The plant is supplying 100,000 m^3 per day (100 MLD) of desalinated water to the region. This fresh water currently reaches approximately 2,000 people and alleviates many of the health concerns brought about by clean water shortages and high water costs.

Natarajan Ganesan, joint General Manager of the Chennai water desalination company, explains that "desalinated water has been integral to the survival and vitality of our city, as many cannot afford the extremely high premiums for transporting an adequate amount of water from lakes and reservoirs. Energy Recovery's energy saving technology makes it possible for us to receive clean, reliable water at a much more competitive cost, enabling our people to live without the fear of insufficient water."

By dramatically reducing energy consumption and costs, the PX devices enable the Chennai plant to produce drinking water at just over USD 1 per 1,000 liters. The result is clean, affordable fresh water to a region that desperately needs it.

With the success of the Chennai desalination plant, an additional Indian desalination plant is in the planning process, and will follow suit with the use of Energy Recovery's PX devices to help ensure a consistent supply of fresh water for the future.

About the Contributor

Energy Recovery is founded in 1992. The company has invested years of research and development to build the most efficient energy recovery devices available today, bringing the versatile solutions that will meet the demands of any size water project or environment.

To know more about the contributor, you can write to us. Your feedback is welcome and should be sent at: mayur@eawater.com. Published letters in each issue will get a one-year complimentary subscription of EverythingAboutWater Magazine.