

Battling shortage, metro rail mulls ways to cut dependence on water

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Metro rail has made commuting across the city comfortable and easier, but it takes a large amount of resources like water to keep the facility running.

More than two lakh litres of water is used to run 32 metro stations every day. Nearly 64% of that goes to power the air conditioning systems in 19 underground stations while the rest is used for the functioning of the 13 elevated stations and for other purposes.

Underground stations consume the most - 9000 litres a station every day -- as air conditioning systems are kept running both at the concourse and platform level during the operational hours from 4.30am to 11pm.

"The AC systems require 7,000 litres a day for one station as water is used as a primary cooling medium and refrigerants as the secondary medium," a metro rail official said.

Nearly 3,000 litres of water is used for the functioning of one elevated station. It is mostly used to power the AC systems inside the station control rooms and other rooms that house power systems.

"The water required for daily operations is supplied by Metrowater," a metro rail official said.

But Metrowater is struggling to meet the city's water demands after an already delayed northeast monsoon failed to fill the reservoirs that feed the city. According to India Meteorological Department, rain deficit in Chennai was nearly 55% in the October-December monsoon last year.

To reduce its dependency on Metrowater and to cut down on the massive water consumption on a daily basis to run the network, metro rail has come up with several measures. It has started constructing a sewage treatment plant at Guindy metro station with a capacity of 10KLD. Officials said it is likely to be commissioned in a month.

"We will use this recycled water in restrooms, cleaning the stations and for gardening. We will also be building similar plants in other stations," an official said.

At present, around 600 litres collected from AC condensation and RO rejects are being reused in restrooms and air-conditioning systems. But the biggest effort would come from metro rail adopting a new gas-based air conditioning technology for three underground stations under construction for phase-1 extension line to link north Chennai.

The new 'variable refrigerant flow' (VRF) technology will use refrigerants as the cooling medium. To be installed in three stations - Washermenpet, Tondiarpet and Korukkupet - the new technology, according to metro rail, is energy-efficient, requires less space and is cheaper than the existing system. Metro rail is also planning to adopt the same system in its 118.9km phase-2 project.

NEEDED IN PLENTY

How much water Chennai's metro rail needs daily and for what purposes

Pic: B. A. Raju



IN THE PIPELINE

10KLD (kilo litres a day) sewage treatment plant will be commissioned within a month at Guindy elevated station

Treated water to be used in restrooms, station cleaning and gardening

Similar plants to be installed at other stations

UNDERGROUND STATIONS

9,000 litres of water used in one station daily

1.7L litres used in 19 facilities a day

7,000 litres required every day to operate AC in one station

ELEVATED STATIONS

3,000 litres of water used in one elevated station every day

RECYCLING

600 litres of water recycled in one underground station

11,400 litres water recycled in 19 such facilities

Recycled water collected from AC condensation and rejection from reverse osmosis plant

Recycled water used in restroom at elevated stations and AC system in underground stations

1.33L LITRES water used for AC systems across stations a day



A dripping tap is almost like an SIP; in the long run it becomes big

There are studies that say size of a drop is one-fourth of a millilitre

By that estimate, around **15,000 drops** make 3.5 litres of water

If your tap drips once in two seconds, it will take roughly 8 hours and 30 minutes to lose 3.5 litres

In 24 hours, 10 litres would have gone down the drain, enough to wash a week's vegetables

So, fix it

With ACs switched off, commuters feel the heat

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Commuters walking into underground metro stations hoping to cool off end up sweating more in the platforms as air conditioning systems are switched off during non-peak hours. Wall-mounted and pedestal fans have replaced air conditioning in some stations.

Metro rail officials said air conditioning systems that work on water are switched off from noon to 5pm due to water scarcity. By doing so they are saving 90% water in each station every day. Commuters who go to underground

Metro rail officials said they turn off the air conditioning to save water but switch it on a few minutes every hour to maintain a temperature of 26°C. "Metrowater supply is erratic. We function with water supplied every day through Metrowater tankers for which we pay in advance," an official said.

However, rooms that house signal, communication and control systems and the UPS - have variable refrigerant flow air conditioning system which works on refrigerant. "Though VRF consumes less power and space, we cannot use it for the entire station because it is expensive," the official said.

metro stations such LIC, Nandanam, High Court and Anna Nagar East complained of suffocation, particularly in the afternoon hours. "After sweating, we hope there will be AC in the stations. But it feels quite stuffy at the platform," said D Vikram, a commuter who boards train at Thirumangalam.

Commuters said though cold air blows from the ticketing counter at the concourse level where there is air circulation due to its proximity to the station's entry points, there was no ventilation at the platform. "What's the point in having fans? They are not the same as AC," said Dilip Kumar, a commuter.