

Water Supply Independent of Plumbing

Water-related issues are growing increasingly severe around the world.

ENELL is working to create water infrastructure with technology that produces water from the air.

The Representative Director of ENELL, Inc., Akashi Taro, worked with engineers to develop an off-grid, next-generation water dispenser called mugen-sui. It can produce safe drinking water from the air, rainwater, and even river water without using chlorine or other chemicals.

The mugen-sui dispenser can generate water from water vapor in the air, depending on humidity and temperature, without requiring a conventional water source or plumbing. In addition, it incorporates proprietary technologies that can purify and disinfect river water and rainwater to safe drinking water standards without using chemicals. A single mugen-sui unit can generate up to 33 liters of drinking water from the air and purify 600 liters of river water per day.

Conventional water supply infrastructure depends on three factors: rain, chlorine disinfection, and plumbing to deliver water. But these do not address real-world issues like disaster management and aging infrastructure, which can prevent the steady and sustainable delivery of safe water.

ENELL's idea was to create a system that allows anyone to secure safe drinking water anywhere on their own. To put the technology into practical use, Akashi and his team took extensive measures to ensure water quality and safety.

An institute certified by the Tokyo Metropolitan Government tested their tech by pouring water from a river running under a park in Tokyo into mugen-sui every day for a month to purify. A month later, they tested the water and found that it met drinking water standards without the use of chlorine, and there

were no traces of general bacteria or E. coli either. Furthermore, the generated water remained sterile despite being exposed to air in the tank. Even after six months of storage, the water was free of bacterial contamination.



Akashi Taro, Representative Director of ENELL, Inc.

A Last Line of Defense to Provide Water

In Japan, the true potential of ENELL's technologies will be demonstrated in disaster-stricken areas or regions with decreased populations, where existing infrastructure may be struggling to function. The mugen-sui dispenser requires around 350 watts of electricity to produce water from the air, but only 30 watts when purifying and disinfecting river water or rainwater and storing it in a sterilized state. It means the unit can be run on about the same amount of power as charging two smartphones. With a combination of solar panels or rechargeable batteries, it can be operated steadily for an extended period of time, even during blackouts.

The company's products are also starting to be used on Tokyo's remote islands, where they can be



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installed in new facilities like trailer hotels. ENELL's off-grid dispensers can serve as a "last line of defense" to provide water.

ENELL's Proprietary Infrastructure Can Help Resolve Environmental Issues

ENELL's technology, which utilizes water vapor in the air, is being recognized as a way to not only secure water resources but also counter climate change. According to the National Institute for Environmental Studies, Japan, water vapor contributes significantly to the greenhouse gas effect—more than twice as much as CO₂. Reducing water vapor by removing moisture from the air may help mitigate global warming.

Mugen-sui is starting to be used in smart cities, utilized as a secondary source of water for medical equipment, and installed in facilities like camping cars. ENELL offers the product at a low monthly subscription rate, which includes filter replacement and maintenance, making it easy to adopt.



Technology from Tokyo to the World

ENELL is receiving many inquiries from around the world regarding its technologies. Rather than simply exporting units to regions with underdeveloped water infrastructure, such as the Middle East, Africa, and Southeast Asia, the company wishes to work alongside them to create water production systems tailored to the needs of each country.

In 2024, ENELL won an award of excellence from one of Japan's largest public-private co-creation acceleration programs supported by the Tokyo Metropolitan Government, and is striving to grow even further by collaborating with and receiving hands-on support from local governments. ENELL also exhibited at SusHi Tech Tokyo 2025, Asia's largest innovation conference, drawing interest from various countries worldwide.

Akashi believes that addressing the challenges Japan is facing will show a way forward to resolve various water issues occurring worldwide. Very soon, the technologies of this Tokyo-based water infrastructure startup may revolutionize the world's water issues.



SusHi Tech Tokyo, short for Sustainable High City Tech Tokyo, is a Tokyo-based concept that leverages high technology to help create a sustainable city, delivering messages at home and abroad showcasing Tokyo's comprehensive attractiveness, and the challenges of resolving urban issues.

The compact mugen-sui dispenser can generate up to 33 liters of drinking water from the air and purify 600 liters of river water per day.