

CASE 03 ▶ Water

OUR INSIGHT AND STRATEGY

Water is one of the focus areas for Hitachi's Social Innovation Business. Hitachi aims to become a comprehensive water service provider, responsive to the needs of the market and its customers. The water business unit seeks to resolve water-related issues by providing end-to-end solutions worldwide, from design and construction of purification, desalination, and sewage treatment plants to the building, operation, and maintenance of monitoring and control systems.

Changing Markets and Sustainable Development Goals

Demand for water resources is increasing rapidly, driven by population growth, economic expansion, and urbanization. The Organization for Economic Cooperation and Development estimates that by 2050 world water demand will have increased on the order of 55% in response to growth in manufacturing, thermal power generation, and home use. The market for seawater desalination plants in particular is expected to double in size by 2020.

Hitachi has supplied water-related products and systems to more than 200 sites in 40 countries and regions around the world. We are currently expanding globally, with focus areas including the ASEAN countries and India, where rising populations are fueling major market growth; the Middle East and Africa, where the need to secure drinking

water is acute; and North America, where increasing attention is paid to drought countermeasures.

Some water-related challenges are global in scope. Two of the United Nations' Sustainable Development Goals (SDGs) deal specifically with water: Goal 6, "Ensure access to water and sanitation for all," and Goal 14, "Conserve and sustainably use the oceans, seas, and marine resources." Hitachi is determined to leverage its technology to supply safe and affordable water to people throughout the world, provide sewage treatment and other sanitary facilities, and construct systems enabling more efficient use of water. Additionally, we will continue striving to reduce marine pollution and help achieve the SDGs.

Business Rollout in Response to Regional Needs

★ Seawater desalination/ advanced water treatment projects (including focus areas)

● ODA projects

■ Engineering bases

Activities

Expand business in seawater desalination and advanced sewage treatment fields
(respond to needs through superior technologies)

Steadily promote and expand large-scale projects
(ODA projects, partnerships using unique technologies)

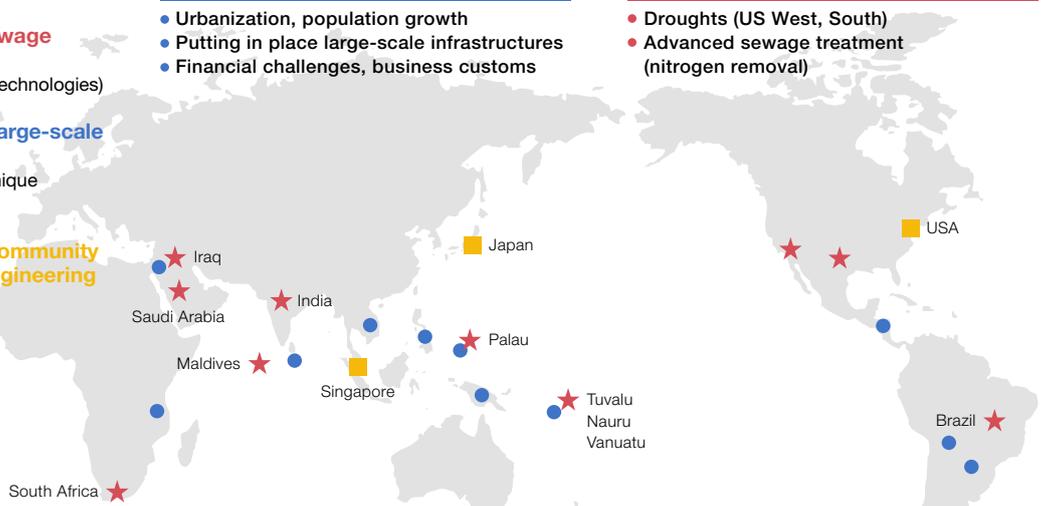
Roll out business with close community ties by strengthening Front Engineering
(Singapore, USA)

Developing countries, emerging countries

- Urbanization, population growth
- Putting in place large-scale infrastructures
- Financial challenges, business customs

North America

- Droughts (US West, South)
- Advanced sewage treatment (nitrogen removal)



Island countries, resorts

- Small, compact
- Package proposals (water landscape facilities, pools, etc.)

Shipboard plants

- Small, compact
- Environment resistant (vibration, salt damage)

OUR ACHIEVEMENTS

As a comprehensive water service provider rooted in each individual region, Hitachi takes social issues into account when considering market and customer needs and supplying technology. It also promotes a variety of local initiatives, including participation in business planning and human capital development.

Enhancing Regional Autonomy Through Water Initiatives

Seawater Desalination Initiatives in South Africa

In 2016, at the request of the New Energy and Industrial Technology Development Organization (NEDO), Hitachi began an integrated seawater desalination and water reuse system demonstration project in eThekweni, formerly known as Durban, South Africa.

eThekweni is on the Indian Ocean coast and has a population of roughly 3.6 million. Its water shortages are due to the concentration of this population in urban areas and its lack of precipitation. Seawater desalination was the first potential solution to be investigated, but conventional systems require high-pressure pumps to force seawater through reverse osmosis (RO) membranes, and these pumps consume a great deal of electricity. With electricity costs rising sharply in South Africa of late, this proved a significant hurdle.

Meanwhile, Hitachi's interest in developing and accumulating operational and administrative knowledge about the water business, with a particular orientation toward international development, had seen the company work with Toray Industries, Inc. and other partners to establish the Global Water Recycling and Reuse Solution Technology Research Association in 2010. Under contract from NEDO, and in collaboration with the municipal government of Kitakyushu and other partners, Hitachi opened Water Plaza Kitakyushu, moving forward with pilot experiments for a new energy-efficient desalination technology Hitachi had developed and dubbed "RemixWater."

Kitakyushu had experience in the water business through public-private partnerships, particularly in Southeast Asia, and took the initiative in inviting researchers and observers from around the world to visit and study at Water Plaza Kitakyushu. Hitachi's RemixWater system was of great interest to the delegation from eThekweni, and the current demonstration project was the eventual result.

By diluting seawater with treated sewage, RemixWater reduces the desalination pump pressure, cutting the energy consumption of the system as a whole by around 30%. The burden on the environment is also reduced, with the water ultimately discharged into the ocean almost exactly as dilute as seawater. For this demonstration project, Hitachi will install a new RemixWater system in eThekweni's existing sewage treatment facilities, sufficient to desalinate 6,250 m³ of seawater per day—enough for around 25,000 people. The demonstration period is planned to last until November 2020.



A sewage treatment plant in eThekweni is the planned site of the RemixWater demonstration project.

Nurturing Young Engineers in South Africa

Hitachi believes that to resolve social issues like those identified by the SDGs, it is crucial not only to provide technology but also to nurture human capital rooted in each region. Since 2009, with the support of South Africa's Department of Science and Technology (DST), Hitachi has run the Hitachi-DST Scholarship Program for South African Engineers, which aims to support the development of young engineers in South Africa. Since fiscal 2015, Hitachi has contributed to the development of young human capital in South Africa by inviting around five engineers from the water treatment field to Japan each year, where they spend around two months observing Japan's cutting-edge advanced water treatment technology and participating in technical training at Hitachi's factories and other facilities.

Hope Joseph, a fiscal 2016 training program participant who is based in eThekweni, says, "Water Plaza Kitakyushu was very interesting as it showcased the RemixWater plant, which uses technology with low environmental impact—energy-saving as well as cost-effective. The program also changed my views as an engineer, making me realize that structured institutional mechanisms are required for the success of a project as well as technology." Joseph now holds presentations to share what she learned in Japan with her co-workers back home. There is great interest in South Africa in private initiatives to nurture human capital, and Hitachi's steps in this direction are welcomed warmly.



Workshop participants paying a courtesy visit to the mayor of Kitakyushu (Hope Joseph is fifth from the right).

The SDG Workshop in the Water Business Unit

To grasp the evolution of market needs from a perspective centered on the UN Sustainable Development Goals, Hitachi held an internal workshop for water business unit engineers, with external experts also invited to participate, on the theme "Expanding business potential by understanding needs from an SDG-centric perspective." One issue explored at the workshop was how the business should recognize regional social issues surrounding products and services, with seawater desalination in South Africa used as an example. Hitachi will continue to both raise awareness of the SDGs and develop its water business in order to help resolve social issues.