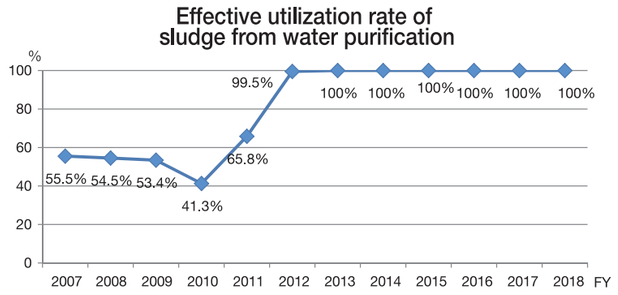
Environment-friendly Initiatives

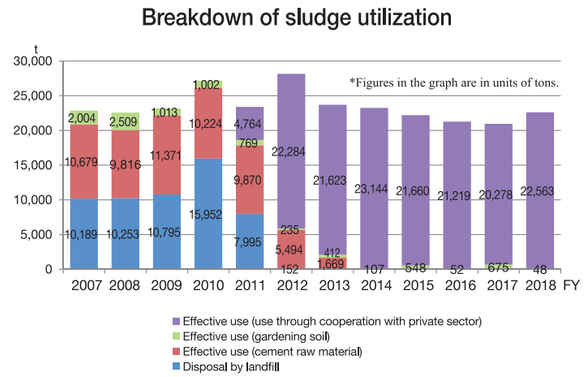
Effective use and recycling of sludge from water purification

The Kunijima Water Purification Plant and the Niwakubo Water Purification Plant use pressure dehydrators, and the Toyono Water Purification Plant uses solar drying reservoirs to perform wastewater treatment.
Since sludge generated in waste water treatment processes is classified as industrial waste, the City has promoted the effective use of the sludge and the reduction of the amount of sludge generated.
Until fiscal 2010, sludge from water purification treatment was mainly used as cement raw material, gardening soil and water-retaining pavement material, with the effective utilization rate staying around 50%. Starting from fiscal 2011, in order to raise the effective utilization rate and reduce the cost for disposal, the City established partnerships with the private sector to adopt their technologies and ideas, such as reusing the sludge as backfill soil, and has achieved a utilization rate of 100% by fiscal 2013.
The City will continue to promote more stable and effective use of sludge from water purification in cooperation with the private sector, thereby maintaining the utilization rate of 100%.

Pressure dehydration system (Niwakubo Purification Plant)

Solar drying system (Toyono Purification Plant)





Construction of the environment-friendly administrationbuilding of Kunijima Purification Plant

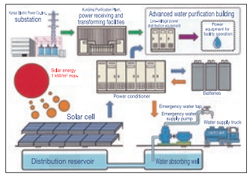
The administration building of the Kunijima Water Purification Plant was constructed in March 2007 as the facility to conduct comprehensive management of the Kunijima Water Purification Plant.
This building is designed to be environmentally friendly, featuring rooftop gardening, cooling with cool tubes, water spraying to shading louvers and outdoor air-conditioner units to reduce air-conditioning load. The surrounding roads are paved with water retaining material.

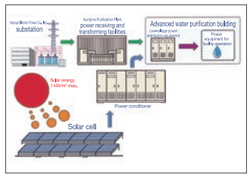
Solar power generation systems

To promote use of energy friendly to the global environment, the City has introduced solar power generation systems at the Kunijima Water Purification Plant and four waterworks centers.

[Overview of solar power generation system at Kunijima Plant]

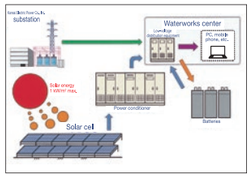
The Plant normally uses a part of the generated electric power for the operation of its advanced water treatment facilities. The power generator installed above the purification reservoir is furnished with power storage equipment and emergency water supply equipment, which enable temporary water supply to water trucks in the event of a power outage for a long time.
(1) Above distribution reservoir (installed in March 1999)
Maximum output: 150 kW
Power generation capacity: Approx. 160,000 kW per hour/year (as of fiscal 2018)
(equivalent to the amount of power used by 36 general households)
Carbon dioxide reduction: Approx. 70 tons/year (as of fiscal 2018)
(2) Rooftop of lower system advanced water treatment building (installed in March 2011)
Maximum output: 250 kW
Power generation capacity: Approx. 260,000 kW per hour/year (as of fiscal 2018)
(equivalent to the amount of power used by 58 general households)
Carbon dioxide reduction: Approx. 113 tons/year (as of fiscal 2018)





[Overview of solar power generation system at waterworks centers]

The generated power is normally used inside each waterworks center. The power storage equipment furnished enables the centers to secure a certain amount of electric power in an emergency.



Solar power generation systems at waterworks centers

Location	Maximum output	Time of installation
East Waterworks Center	10 kW	March 2016
West Waterworks Center	5 kW	March 2016
South Waterworks Center	10 kW	December 2016
North Waterworks Center	10 kW	March 2016

Total power generate at each waterworks center: Approx. 44,000 kW per hour/year (as of fiscal 2018)
(equivalent to the amount of power used by 10 general households)
Total amount of carbon dioxide emissions reduced at each waterworks center: Approx. 19 tons/year (as of fiscal 2018)

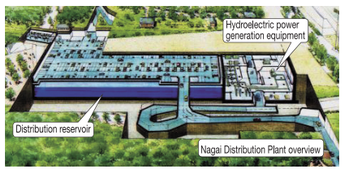
Hydroelectric power generation systems

As one of its environment-friendly initiatives for energy saving and utilization of unused energy, Osaka City has introduced hydroelectric power generation systems that utilize the residual hydraulic pressure of water flowing into water distribution reservoirs. The hydroelectric power generation systems that the Osaka Waterworks Bureau has introduced are as follows:

[Overview of hydroelectric power generation system at Nagai Distribution Plant]

Hydroelectric power generation system at Nagai Distribution Plant

All the generated power is used as part of the electric power for the operation of water distribution pumps and other equipment of the plant.
Installation: November 2004
Type: Horizontal axis Francis turbine
Maximum output: 253 kW
Power generation capacity: Approx. 1.81 million kW per hour/year (as of fiscal 2018)
(equivalent to the amount of power used by 408 general households)
Carbon dioxide reduction: Approx. 787 tons/year (as of fiscal 2018)



[Overview of hydroelectric power generation system at Izuo Distribution Plant]

Hydroelectric power generation system at Izuo Distribution Plant

The electricity generated at the Plant is all sold.
Installation: March 2013
Type: pump-reversing turbine
Maximum output: 110 kW
Power generation capacity: Approx. 530,000 kW per hours/year (as of fiscal 2018)
(equivalent to the amount of power used by 119 general households)

[Overview of hydroelectric power generation system at Sakishima Distribution Plant]

Hydroelectric power generation system at Sakishima Distribution Plant

All the generated power is used as part of the electric power for the operation of water distribution pumps and other equipment of the plant.
Installation: February 2019
Type: pump-reversing turbine
Maximum output: 43 kW
Power generation capacity: Approx. 260,000 kW per hours/year (estimated)
(equivalent to the amount of power used by 59 general households)
Carbon dioxide reduction: Approx. 113 tons/year (estimated)

Energy saving for pumping facilities, etc.

Water intake, purification and distribution facilities consume a large amount of electric power in the water treatment and distribution processes. At these facilities, focused measures have been implemented for the pumping equipment, which consume the largest amount of electricity.
The City has adopted, for the pumping equipment that is easily affected by demand fluctuations, a rotation speed controller that enables constant, highly efficient operation while replacing impellers of some pumps with optimum ones, thereby reducing power consumption.