

Town creation by making use of "river water"

Osaka Nakanoshima District

Creation of a low-carbon-emission town
made possible by unused energy



Town creation by capitalizing on abundant water resources

Osaka City is rich in water resources as about 10% of its area is covered by water surface. Particularly, Nakanoshima located at the city center is an area that represents the water city surrounded by Dojimagawa River and Tosaborigawa River. Though it is a business center, Nakanoshima also has various factors such as nature, history, culture, education, international exchange, information dissemination, etc.

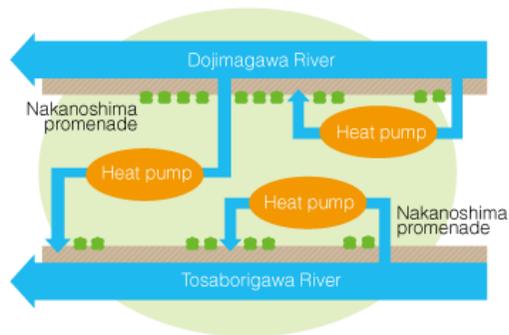
One of the pioneering efforts to create a low-carbon-emission town in Nakanoshima is the redevelopment in Nakanoshima 3-chome area. It is a joint development project commenced under a basic agreement that was reached in 1997 by Daibiru Corporation, Kansai Electric Power Co., Inc. and Kanden Fudosan Co., Ltd. in this area where the development based on the Nakanoshima West Area Development Plan of the Osaka Municipal Government was expected as the center of internationalization, culture and business of Osaka.



[Points of river water utilization in Nakanoshima district]

Highly efficient heat pumps that use river water

The Nakanoshima 3-chome area has adopted a district heating and cooling system that uses unused energy of river water 100% as a heat source with an aim of improving urban environment. Water is taken from Dojimagawa River and drained into Tosaborigawa River by capitalizing on the geographic features of Nakanoshima.



[Image of river water utilization in Nakanoshima district]

Heat pumps can be more efficiently operated by using river water than air-source heat, because the temperature of river water is lower than that of the air in summer and higher in winter. Using river water as a heat source is effective as measures against heat island phenomenon because no heat is released into the atmosphere.

To utilize river water, it is necessary to make plans for water intake and drainage equipment that have no effect on rivers and utilization plans that have little effect on the environment such as ecosystems in rivers. In the case of the Nakanoshima 3-chome area, it became possible to utilize river water by confirming with sufficient surveys and reviews that there would be no effect on the environment. Such efforts have greatly contributed to expanded use of river water in this area. In addition to the Nakanoshima 3-chome area, heat utilization is promoted at several points along the rivers. Heat in the river water is also used at subway station buildings. Nakanoshima has become a model of creating a low-carbon-emission town that effectively utilizes unused energy in urban areas by capitalizing on geographic features.

Further development of Nakanoshima with the aim of creating a low-carbon-emission city

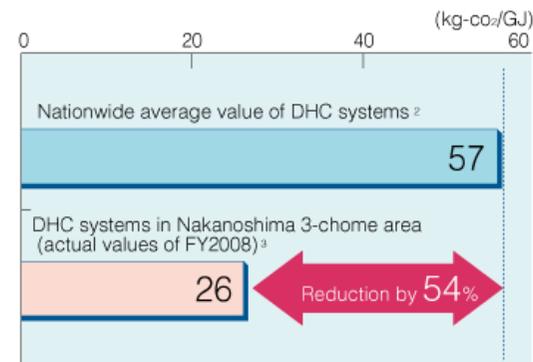
In Nakanoshima 2-chome area, at present, the development of “Nakanoshima Festival Tower” is now underway, and the Osaka head office of the Asahi Shimbun Company and a festival hall will be located in the tower. District heating and cooling by using river water is also planned for the tower. Utilization of river water is further increasing.

As for the effect of using heat in the river water on water temperature, it is considered that there is not much impact on life if the temperature change is kept

within a range of less than $\pm 3^{\circ}\text{C}$ in general. According to an estimation*1 made by Kanden Energy Development Co., Inc. which conducts district heating and cooling business in Nakanoshima district, even in the case of air-conditioning by using river water on a scale more than 2.5 times as large as the total floor area of district heating and cooling now planned in Nakanoshima 2-chome and 3-chome areas, the results of the estimation show that the change in river water temperature would be kept within a range of less than about $\pm 2^{\circ}\text{C}$. There is still much room left for further utilization of river water.

Nakanoshima is designated as a district for urgent development for city revitalization and a model district for measures against global warming and heat island phenomenon. In the regional development policy, it is clearly stated that “urban development projects with consideration given to the environment will be promoted such as the introduction of district heating and cooling systems that utilize river water,” and environment-conscious development is increasingly desired.

Even though the hurdle for reduction in carbon emissions is high, it is possible to create an attractive town, if those who are concerned have a system to carry out new attempts. In Nakanoshima, favorable blocks are formed by raising environmental awareness, leading to the improvement of the brand of local community. Nakanoshima is expected to further grow as a low-carbon-emission town.



[CO2 emissions per quantity of heat sold from district heating and cooling systems in Nakanoshima 3-chome area]

*1 Model project to promote sustainable urban redevelopment (under contract from the Ministry of the Environment)
 *2 The value stipulated in Cabinet Order under the Act on Promotion of Global Warming Countermeasures (emission intensity of steam (excluding that for industrial applications), hot water and cold water supplied by others: 57 kg-CO₂/GJ)
 *3 CO₂ emission intensity is calculated based on Kansai Electric Power Co., Inc.'s actual value of 0.299 kg-CO₂/kWh (after reflection of emissions credits under the Kyoto mechanism) in FY2008.