

LETTER FROM TOKYO



Industry growing thirsty

Japan's growth lends pressure to the push for desalination

by Stuart Griffin

Desalination of seawater is emerging as a new, important industrial activity in Japan.

The Government's Science and Technology Agency is organizing a new effort in the desalination of seawater as of April 1, start of the 1969-70 Japanese fiscal year. Interest in this technology is logical, the agency maintains, in view of the rapid progress of industrialization, the urban population concentration, and the advance in Japanese living standards in recent years.

Private firms, with Government backing, are stepping up research and development as well as manufacturing efforts. In addition to domestic needs, Japan sees a major overseas market for desalination technology.

The Government forecasts a new multi-faceted industry growing out of the intensified desalination program, because of its close connections with nuclear power, other energy industries and the chemical-petrochemical industries.

Japan's water consumption is still at an unusually low level compared to that of other nations. U.S. water usage, for instance, is already as high as 2,400 tons a year per capita, more than three times that of Japan. But with that rate rising briskly, shortages may be expected before long, at least regionally, unless steps are taken.

The Ministry of Construction estimates a shortage of 1,000 million tons annually in the industrial and heavily populated Kanto region centering around Tokyo-Chiba-Tsurumi-Kawasaki-Yokohama, and of 300 million tons yearly in the congested and equally economically important Kansai district, focusing around Nagoya-Osaka-Kobe.

Cost of processing natural fresh water is seen as a major problem in attempts to boost water supplies. In the case of Tokyo, the annually soaring cost of manufacturing potable water stands at about 10.5 cents a ton; the public selling price is 7.5 cents a ton.

But with new water resource development projects continuing to rise in cost, in the highly industrialized Kanto region in particular, processing costs may well rise to about 13.8 cents, from 10 to 11 cents, and in the Kansai district, from 9 to 12.5 cents.

The Science and Technology Agency sees desalting of seawater as the answer, however, to pressing social-industrial problems about 10 years hence, on a practical commercial basis.

Its current program, under which all key public-financed and industrial re-

search and development efforts will be officially listed and given all required state assistance, looks to speeding up the date, from 10 to 8 years.

The primary agency objective is to complete a multistage, flash-type test plant with a daily fresh-water output of 3,000 tons, and to follow this up with construction of a 100,000-ton-per-day pilot plant. Ultimate target is the creation of a plant able to manufacture daily between half a million and one million tons of fresh water at an acceptably low cost of about 8.3 cents per ton at the outset, dropping down progressively to 7.8 cents in three to five years, and to 7.5 cents two years later, by the end of 1980.

Another immediate motive of the accelerated industrial desalination drive is the desire to expand equipment exports, primarily to the Middle-Near East and the Southeast Asian regions.

Ishikawajima-Harima Heavy Industries has teamed up with Sasakura Engineering to export to Kuwait four seawater desalting systems of 9,000 tons each in daily output, and one of 18,000-ton capacity. The two Japanese firms are also competing in international biddings for four more Kuwait orders involving five giant systems, each to produce 22,700 tons per day.

The biggest roadblock, as in every commercial seawater desalting attempt, involves high output costs, especially the cost of heat energy. Japan's one commercial seawater desalination plant, now operating at Ikeshima, in Nagasaki Prefecture—itsself a 2,700-ton-per-day plant of the Matsushima colliery—reportedly spends almost 28 cents to produce every ton of fresh water.

Japanese engineers say that if a boiler burning crude oil were to be used for obtaining necessary steam heat, one ton of steam would cost about \$1.60. This would mean a still-prohibitively high output cost of 16.6 cents per ton of fresh water.

Utilization of the waste steam energy of thermal-electric power plants thus has come to be seriously considered in Japan as in the U.S. Such plants waste some 50 percent of the steam energy used in the generation of electricity. A few experimental trials are now underway, chief of them a Mitsubishi attempt at Tokyo Electric Power Company's Tsurumi complex, near the capital city.

As a natural extension of the attempt, utilization of similar waste steam energy of nuclear electric power plants, now mushrooming in Japan, is also under study.