

Nuclear power used to tap water from the oceans

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On the coast of southeast India, near Madras, engineers at Kalpakkam are finalising plans to connect a new desalination plant to an existing nuclear reactor. Within a year the plant is expected to be sucking in about 35,000 cubic metres of seawater each day to produce 5,400 cubic metres of fresh water for the local community.

But India is not the only country now developing nuclear desalination facilities. Faced with water shortages, growing populations and global warming, countries from the United States to Indonesia are looking to nuclear energy to tap the potential fresh water locked in the oceans that sparkle along their arid coastlines.

South Korea has designed a 330-megawatt reactor for desalination and electricity. Canada and Russia are pooling their expertise to build floating nuclear desalination units, which can be moved around the world's oceans on barges. In the US scientists at the Argonn National Laboratory have renewed their interest in using nuclear energy to power 500 desalination plants. Tunisia is talking to France, and Morocco to China, about nuclear desalination plants to supply the local populations along the north African coastlines with fresh water and electricity.

However, nuclear desalination is nothing new. For more than 20 years Japan has been successfully operating nuclear desalination facilities in remote coastal areas. There are currently more than 1,500 desalination plants operating around the world. But the problem is that almost all of them use traditional fossil fuels, which release greenhouse gases.

Toshio Konishi, from the nuclear

technology and developmental section of the International Atomic Energy Authority, the global nuclear watchdog, says that the main advantage of using nuclear energy to extract fresh water from the sea is that nuclear plants produce far less carbon dioxide.

The US energy department estimates that coal-fired power plants produce 964 tonnes of carbon dioxide for every gigawatt hour of electricity, while nuclear plants produce only 7.8 tonnes.

But in spite of nuclear's relatively clean bill of health in terms of carbon dioxide emissions, Konishi warns that most developing countries do not have the regulatory and legal infrastructure needed to construct and operate nuclear power plants safely. Furthermore radioactive waste from nuclear plants comes with its own environmental and economic problems.

Water produced by nuclear desalination can also be expensive. Even though a cubic metre of water can be produced for as little as a few cents, bottling it and transporting it can push up the price of a litre to more than 20 cents. Pumping water through pipelines to irrigate agricultural inland areas is also prohibitively expensive and technically difficult.

Environmental groups argue that renewable energy is the only way forward. Saudi Arabia has led the way by developing desalination plants using solar energy.

In spite of the interest in nuclear desalination, most experts agree that simultaneous action on a number of fronts will be needed to tackle world water shortages, especially in the developing countries, including the better management and conservation of existing water resources.

The Week

● The South African government has unveiled plans to provide anti-retroviral drugs at state hospitals. Pressure had mounted on President Mbeki to rethink his view that drugs did not stop the spread of HIV.

● Pope John Paul told American cardinals summoned to a meeting at the Vatican that he is "deeply grieved" by the paedophile scandal affecting the Roman Catholic church in the US.

● Mexico confirmed that despite its ban on genetically modified maize there is massive GM contamination of crops in areas that act as the gene bank for one of the world's staple foods.

● Robert Watson, chairman of the Intergovernmental Panel on Climate Change, was ousted after pressure by the US, Exxon-Mobil and other energy firms to get him replaced. The panel had called for urgent action to curb global warming.

● The Hungarian Socialist party and its liberal Free Democrat allies began preparing a coalition government after narrowly defeating the centre-right coalition in a general election.

● The Philippine presi-