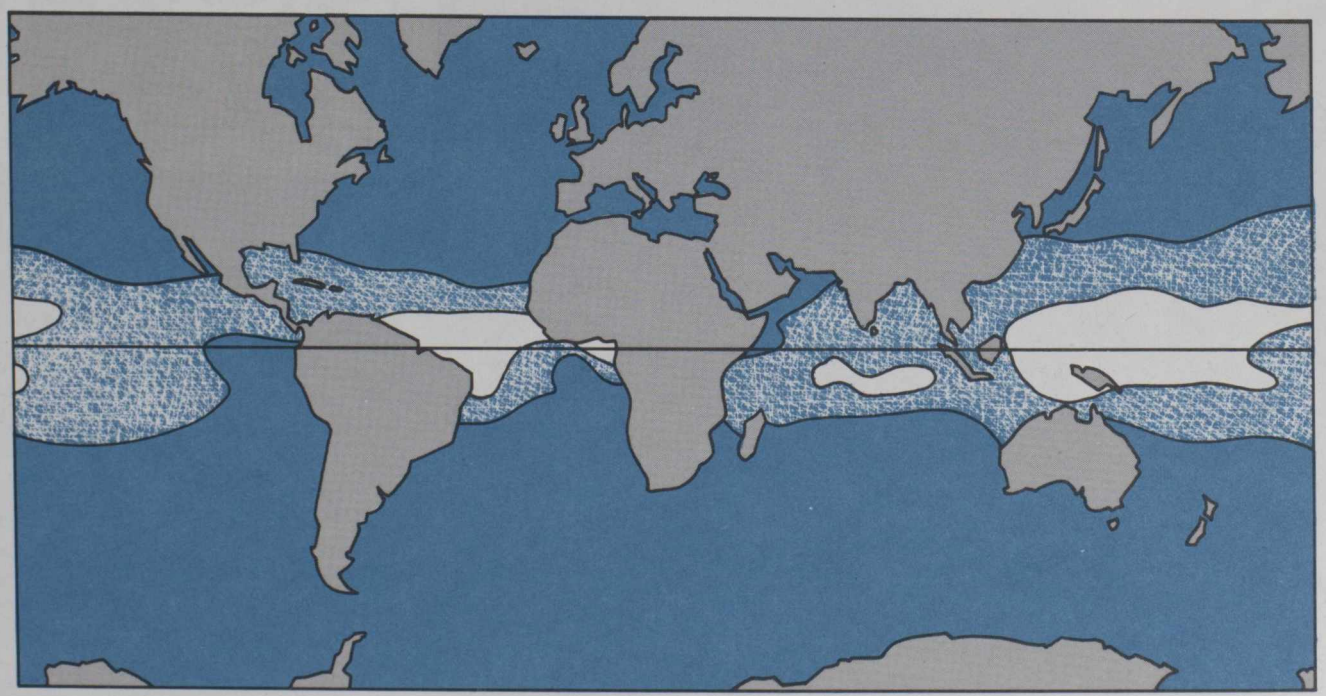
sent up to half the total plant investment) and the exchangers themselves present a continuous problem with corrosion and fouling with marine creatures on their seawater side.

There are also serious legal questions which must be addressed and resolved at the international level over who owns oceanic resources before extensive commercial development of OTEC power takes place.

Because of the great potential of the ocean thermal energy resource, a number of countries are interested in its development. Projects have been considered off the coasts of Curaçao, the Ivory Coast, Florida, Brazil, Zaire, Tahiti and Martinique and nations most actively involved in R & D include France, Japan and the United States Additional interest has been shown by a consortium of European industrial firms known as EUROCEAN and another industrial consortium is conducting a mini-OTEC experiment in cooperation with the State of Hawaii. The United States Government OTEC development program was funded at $38 million during fiscal 1979.

As mentioned earlier, OTEC facilities may only be seriously considered in regions where temperature differences between shallow and deep waters are 18°C or greater. This prerequisite essentially limits the exploitable resource to the tropics as temperature differences of at least this magnitude are required before plants of acceptable efficiency can be constructed (Figure 6-27). Efficiency is not important in terms of energy cost because the warm water required to power a plant is available at no cost. It is important, nevertheless, in determining the capital cost and size of a plant required to produce a given amount of power. With the efficiency being low (a typical OTEC plant may have an operating efficiency of 4% or less), very large amounts of warm and cold water must be circulated to extract energy. Thus the lower the efficiency the greater the size of the plant and the greater the required capital investment.

Figure 6-27: ZONES[a] OF THE EARTH'S OCEANS FAVOURABLE FOR THE EXTRACTION OF ENERGY FROM THERMAL GRADIENTS



[a] These zones refer to regions where the temperature differential between surface and deep waters (500 or 1,000 m) is always greater than 18°C.

Source: After Brin, 1979, p. 85.