
University of Pennsylvania



Institute for Environmental Studies

presents

Thomas Stauffer

Formerly at Harvard University and University of Georgetown

The Limits of Seawater Desalination

Realistic opportunities for economic desalination of seawater are very much limited. The two binding considerations are: 1) the cost of energy and 2) the inescapable constraints imposed by the Second Law of Thermodynamics. “Cogeneration”, i.e. coupling a desalination plant to a power plant in order to use the “waste” heat reduces the energy required per cubic meter of water, but this “efficiency” is realizable if and only if the water and power requirements are close matched. This match is rare, and the theoretical efficiencies, as published, are seldom realizable. Consequently the real energy requirement for desalination is often 2-4 times higher than the specified figure. Indicators of probable “inefficiencies” are large fluctuations in power demand between night and day and large differences between winter and summer peak demands. The other factor which dominates is the real cost of fuel into the desal plant or the combined joint-production facility. Often local, non-market prices are used to determine “costs”. This is a distortion; world prices for the fuel, converted at the real exchange rate, must be used – i.e. the cost must be based upon the opportunity cost of the energy. The differences can be very large.

Date: Wednesday, January 21, 2004

Time: NOON - 1:30 pm

Place: Carolyn Hoff Lynch Auditorium

On the Penn campus: Chemistry Building

34th & Spruce Street (entrance on 34th Street)

NO REGISTRATION REQUIRED

Direct questions to: 215-573-3164; ies_penn@sas.upenn.edu

<http://www.sas.upenn.edu/earth/ies>
