

pressures below atmospheric pressure, at which liquids boil at lower temperatures. This approach is used in multiple-effect evaporators that evaporate liquid in successive stages (or effects), each stage being at a lower pressure than the previous stage. A low-cost vapor-recompression evaporation system was developed by DOE and LICON, Inc. for use in concentrating electroplating wastes. The energy efficiency of the system is equivalent to that of a conventional 10- to 12-effect evaporation system. In the vapor-recompression evaporator, the energy in the latent heat of the liquid normally lost to the con-

denser by evaporation is recycled by the compressor, providing a temperature difference across the heat exchanger that promotes further evaporation. The only additional energy needed is power for the pressure increase to provide the temperature difference. The result is a decrease in the energy required to remove water to 50-75 Btu per lb. Seven systems are presently operational, saving an estimated 0.05 trillion Btu per year. Projected savings are approximately 11 trillion Btu per year by 2010.