PROJECT OBJECTIVES

Hybrid air conditioners incorporate the advantages of various cooling components in variable speed, multi-mode, machines. These systems are climate appropriate energy measures that recognize how cooling needs and efficiency opportunities are different in each region. In collaboration with several industry partners, UC Davis students are developing modeling tools to support broader application of climate appropriate hybrid air conditioners.

DATA AND INFORMATION FLOW

1. Manufacturers input performance data to Technology Performance Exchange
   - Nominal info
   - Performance maps for each mode

2. Data is compiled, and translated into a format for use in EnergyPlus.

3. Transferable performance curves available to model users on Building Component Library.

EFFORTS UNDERWAY

» Undergraduate students are working with manufacturers to populate performance maps for various hybrid air conditioners.

» UC Davis and LBNL are developing an EnergyPlus module specific to hybrid RTUs.

» UC Davis and NREL are expanding the Technology Performance Exchange
Seeley’s Climate Wizard® uses water evaporation to produce cooled air well below the wet bulb temperature. This system operates with 100% outside air, and achieves full-load efficiency EER>50. At part load, efficiency can be even higher, EER>80. The system is best suited to supply ventilation air in dry, hot climates, but since the technology generates supply air temperatures near that of vapor compression equipment, it can also be used to provide substantial amount of room cooling, usually in combination with separate vapor compression equipment.

A. Centrifugal Fan  
B. Water System and Pump  
C. Indirect Evaporative Heat Exchanger