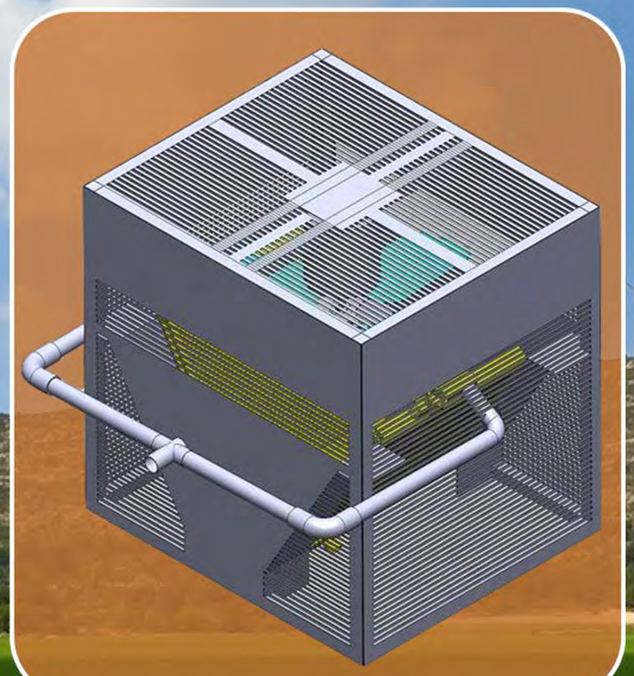
Mini Air Cooling Tower – Hybrid Geothermal Heat Pump Component

Problem Statement

- Optimize and balance the annual heating and cooling load of a residential building in a hot climate.
- Integrate a mini air cooling tower to a geothermal heat pump.



Motivation

- Renewable energy
- Efficient and environmentally friendly
- Growing market
- Low operational cost
- Potential application for current and future residences

Objective

- Design and test an air cooling tower using FIU'S Solar House
- Balance annual heating & cooling load
- Minimize cost of hybrid system

Cooling Tower Requirements

- Air-cooled heat exchanger
- Effectively remove additional heat
- Automatic shut-off valve
- Low cost design

Team Members

Henry Gutierrez

Santiago Paz

Miguel Freire

Faculty Advisor: Dr. Cheng-Xian Lin

Timeline

	Spring									Fall									
Months	September		October		November		December			January		February		March		April		May	
Definition																			
Initation																			
Planing																			
Execution																			
Equipment Research																			
Choose Final Equipment																			
Device assembly																			
Device testing																			
Solid Work																			

Responsibilities

- Henry Gutierrez: CAD design, stress simulation, cooling tower efficiency calculations
- Miguel Freire: Manufacturing, material testing
- Santiago Paz: CAD design, fluid simulation, heat pump efficiency calculations