Wireless Sensor Network
- Wireless sensor network system operated by Arduino hardware
- Solar powered sensor nodes collect temperature and humidity information
- Enters low power state after data transition
- Base station receives information from sensor nodes, and sends to LCD display and computer serial port in real-time
- Computer reads data from serial port, adds time stamps, and labels it into a file

Solar Panel
- 50W/17.8V Solar Panel
- 12V Photovoltaic Battery
- 22V 7 Amp charge controller to regulate charge on battery from solar panel
- Inverter to go from 12V DC to 120V AC and power the pump system

Jean Pain Compost Heater
- Made of layered decomposing mulch and food waste
- Dimensions of 10' wide, 20' length, and 4.5' high
- Wire mesh and metal posts to hold in place
- Perforated tubing for aeration to keep pile active and eliminate turning
- Water flowing through coiled pipe to absorb heat
- Heat exchanger transfers heat to hydroponic system

Temperature Based Pump Control
- Thermocouple used for temperature regulation
- Hydroponic water less than 70°F activates pump until water reaches 80°F
- Flow rate varies between 1-4 gal/min
- Pump is relay activated
- Controller integrated into pump by manufacturer

Future Work
- Retractable cover for greenhouse
- Expanded sensor network to entire facility
- Large scale photovoltaic power system for entire facility
- More compost piles to ensure high temperature output
- Optimize compost mixture for high quality, predictable output