Compact Hyper -Insulated Prototype

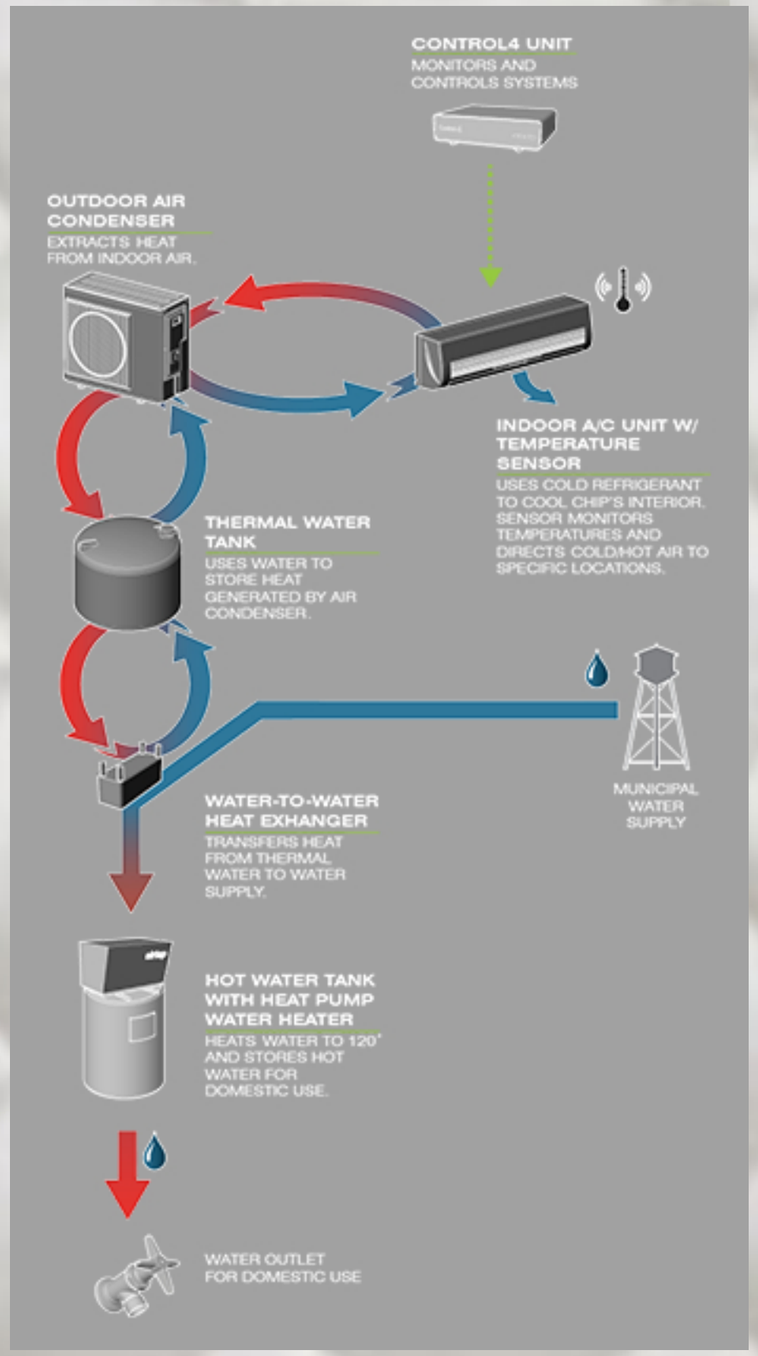
BY SCI ARC AND CALI TECH

PROGRAMMABLE PLUG-INS

The east wall accomodates stock cabinets that can be easily retrofitted and hung on slotted vertical studs. Custom or stock fabric
furniture can be stored within the walls when not in use. A light foam mattresses stored at the southern end of the wall, can be used for sleeping or placed in front of doors and windows for additional insulation on a cold night.

Compact Hyper-Insulated Prototype

BY SCI ARC AND CALI TECH



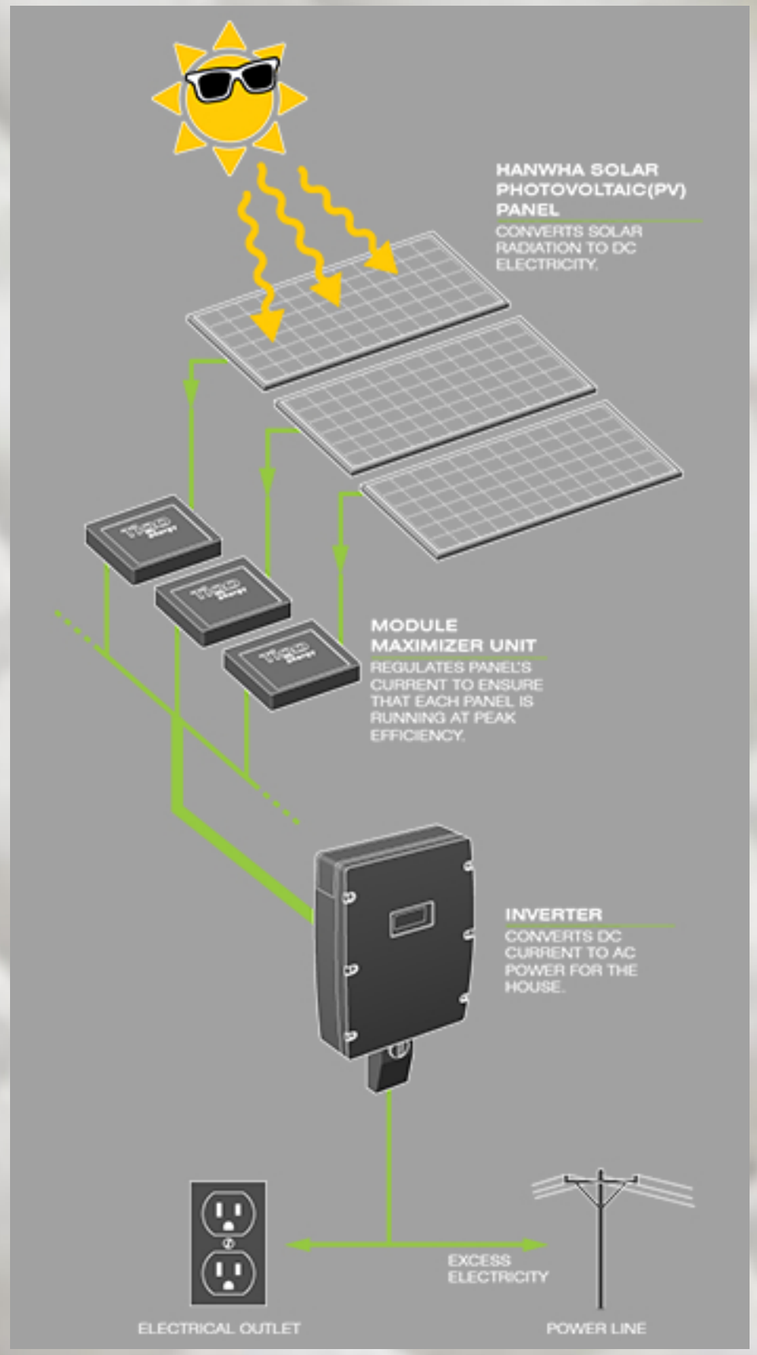
AIR CONDITIONING/DHW

CHIP's energy-efficient mechanical core comes from taking a holistic view of the systems involved. In its cooling mode, an HVAC system extracts heat from the air in the house, while a domestic hot water (DHW) system heats cold water that comes in from the municipal supply. By using the waste heat from air conditioning to heat hot water, we can realize significant energy savings. A thermal storage tank stores the heat from the AC condenser until it is needed to heat water, and a second heat pump ensures that the DHW is always hot enough, even when the AC isn't being used.

SMART HOME FEATURES

The lights, home theater, shades, and mechanical systems of CHIP are connected to a home automation system.

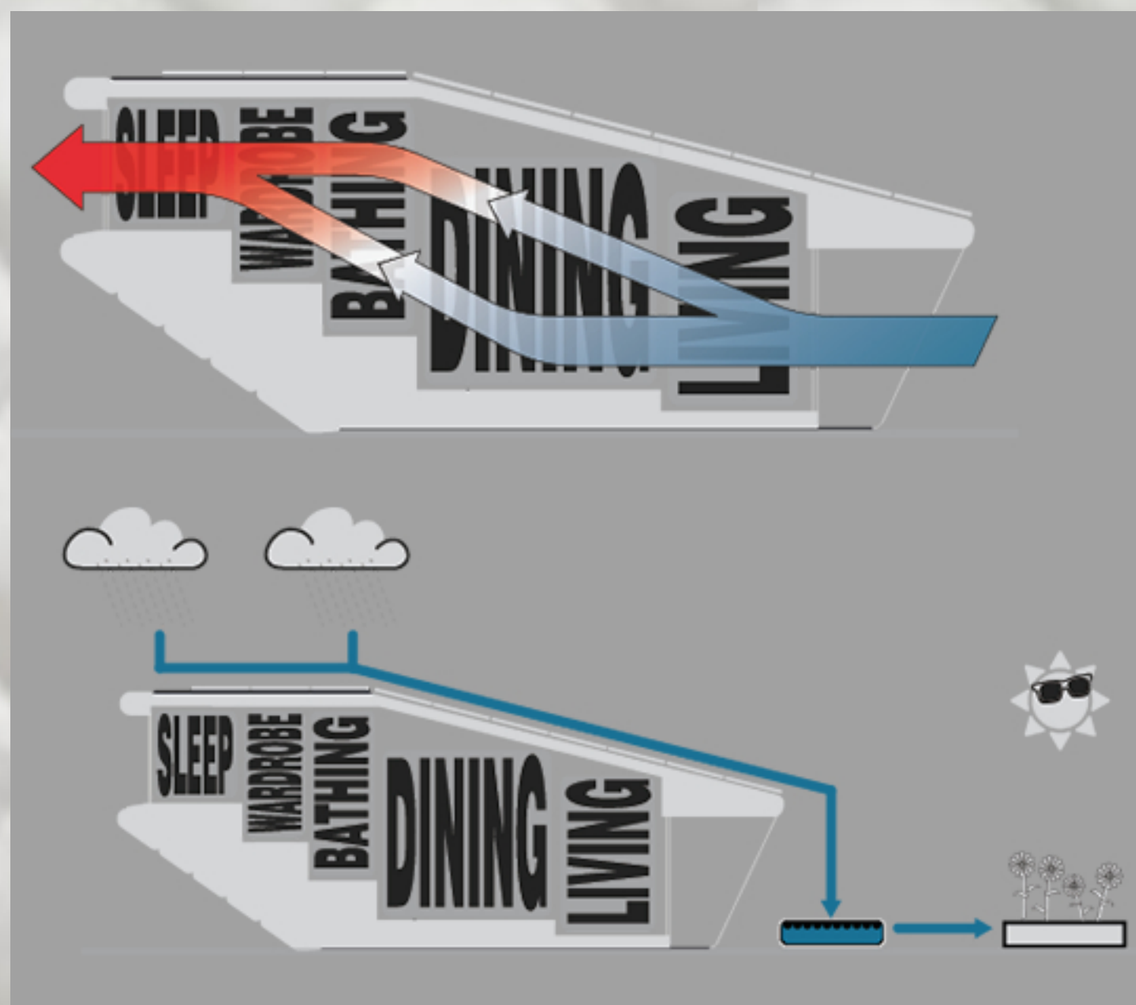
-Slowly turn on your lights in the morning to -wake you more naturally
-Turn your devices on when you sit in certain chairs
-Close the blinds for you when it is bright and you want to watch the projector
-Close the shades when sunlight is shining into your home, heating it up



Compact Hyper-Insulated Prototype

BY SCI ARC AND CALI TECH

RESULTS
3RD IN AFFORDABILITY
2ND IN ENGINEERING
6 OVER ALL



CHIP's the computing system is much like the central nervous system of the human body; not only can it process and monitor the state of the house, but it can react to changes in the environment as well. The computing system is made up of 4 distinct but interrelated components:

Energy Monitoring The energy use of the house is monitored at a whole house level as well as at an individual circuit level. Using eGuage Monitoring hardware, we can determine where the energy from our PV panels are being used.
Control4: Home Automation Nearly all the lights and appliances in the house are hooked up to the Control4 via a Zigbee network. This allows for one centralized location at which every device can be controlled.
Prediction and Planning Data is polled from internet weather forecasting sites as well as SolarAnywhere to determine that state of energy usage and generation by the HVAC and PV array. This information is passed to a planning algorithm, which then calculates the most effect use of the energy.
Home Interface The Home Interface is a system using Apple iPad and XBOX 360's Kinect. Custom Ipad Apps are written to provide a "universal remote" that not only allows devices to be controlled, but can display the state of each device and the energy draw of the house. With the Kincet, a custom software package that allows users to control devices in the home using natural gestures such as pointing and waving.

Compact Hyper-Insulated Prototype

BY SCI ARC AND CALI TECH