The Solar Sandwich house is constructed from a simple system of interlocking parts designed to simultaneously address three crucial issues in current housing practices.

- By utilizing the free and abundant energy of the sun, the house meets all of its own energy needs without relying on commercial energy production, which is not only the source of a large share of atmospheric pollution, but also an increasing financial burden on homeowners.

- The kit of parts shifts more of the construction process to off-site fabrication, allowing greater quality control and economies of scale. Once the parts are shipped to the site, assembly is quicker, easier, and cheaper than conventional stick-frame housing.

- Finally, the system accommodates a wide variety of configurations. It can meet the desires of single-family homeowners which have made tract housing popular without requiring the development of enormous swaths of land.
sandwich impulse

- solar layer
- circulation layer
- living layer
- service layer

structure

- primary: support frame and floor/roof slices
- secondary: PV racks and wall panels
- plug-in PV panels and service modules

bathroom module

- space-saving cabinet design
shading

louvers are computer-controlled, but can be overridden by user
stack ventilation

"scoop" inlets utilize prevailing winds for greater airflow

negative pressure assists exhaust

8m stack height
passive solar heating

thermal mass:
water wall
SSF = 50%
This particular design is a configuration adapted for a specific site on the Knoxville waterfront.
sun

shaded on summer mornings/evenings

trees removed for maximum winter exposure
negative pressure assists stack exhaust flow

cool summer breeze forces air into stack inlet
circulation

trees deflect traffic noise

primary entrance

guest parking

views on approach

possible river walk

ARCHITECTURE | INTERIOR | TECHNOLOGY | SOCIETY
architecture | materials | comfort zone | market viability
kit of parts | appliances | energy balance |
engineering | lighting | hot water | materials
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“Solar Sandwich”
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GROUND PLAN
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total gain and loss

[Bar graph showing total gain and loss for different climate conditions]
single-family home
rowhouse
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