HOME nz provides an entirely new model for single family home construction in Phoenix: a beautiful modern home with open, flexible spaces that integrate the landscape, strong street porch features, and operates with net zero energy use.

The process with net-zero buildings starts with reducing mechanical loads. In other words, instead of spending a lot of money on high efficiency equipment and renewable energy systems, at the beginning, spend effort and resources on design strategies intended to limit the energy needs required to operate the home. Energy loads were reduced by the envelope performance, then high efficiency equipment was selected, followed by renewable energy systems.

Taking cues from the legacy of the 1950’s case study homes - the start of what is now commonly referred to as midcentury modern dwellings - as well as the ubiquitous sprawling suburban developments, Home NZ brings together the spatial, material, environmental and renewable energy practices commonly used by the local construction industry to build the city’s growing communities. The home uses simple forms that opens to its surrounding landscape, with the landscape/site and integral part of the interior space, as an extension, view, and landscape feature. The home incorporates a highly welcoming large front porch, important for community integration and provides activity at the street front.

- 2,185 square feet
- Fits on a 60' x 110' lot with assumed setback lines
- Design is orientation neutral; works in any lot orientation
- 3 bedrooms
- Exceeds IRC 2012 code
- HERS score of 30, HERS score of 0 with Renewable energy

Cost and Affordability
The cost of this innovative desert sustainable home is within the range of the market for homes of this size.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>$28,160 (including slab insulation)</td>
</tr>
<tr>
<td>Framing</td>
<td>$72,430 (includes insulation per SIP panel)</td>
</tr>
<tr>
<td>Insulation</td>
<td>$18,840 (additional insulation; EIFS and built up roofing)</td>
</tr>
<tr>
<td>Fenestration</td>
<td>$10,898</td>
</tr>
<tr>
<td>Mechanical equipment and controls</td>
<td>$25,631</td>
</tr>
<tr>
<td>Total</td>
<td>$343,814 (including contractor overhead)</td>
</tr>
</tbody>
</table>
HOME NZ Site Flexability

HOME NZ is truly orientation flexible due to the complete shading elements integrated with every glazing element and porch. The exterior shading is operable therefore can be open when not in sun, closed when exposed.
Home NZ Energy Efficient Envelope

KEYS TO AN ENERGY EFFICIENT ENVELOPE

1 INSULATION
2 PROTECTED GLAZING
3 EXPOSED GLAZING
4 COOL ROOF

STRUCTURAL INSULATED PANELS (SIPS)

SIP panels are the building material for the 21st Century. Structural insulated panels provide all structural support and continuous insulation in a state-of-the-art, simple-to-construct panel. These panels are used throughout the home including the roof for a complete, holistic insulated envelope.

Use of highly efficient Solarban 70XL glazing to reduce heat transmittance.

Protective fabric screen prevents 95% of direct sunlight from reaching the glass, drastically reducing the solar heat gain. The shades are retractable to allow control of natural light when sun exposure is not present.

Daylighting is designed to be sufficient for all times of day.

Integrating shade elements at major glazing reduces the direct heat gain on the glazing. By making both of these systems operable, the design takes advantage of natural ventilation and leads to a passive cooling strategy as well.

23% vs 5% SHADED VS EXPOSED

Daylighting is designed to be sufficient for all times of day.

Integrating shade elements at major glazing reduces the direct heat gain on the glazing. By making both of these systems operable, the design takes advantage of natural ventilation and leads to a passive cooling strategy as well.
Annual Saving: $2,046

SMART HOME TECHNOLOGIES

- LED bulbs
- Smart thermostat with home and away functions
- Remote management system allowing mobile control and displaying energy usage
- Smart Wi-Fi outlets and plugs
- Energy efficient appliances
- Variable speed air conditioner limits start/stop boosting efficiency by 800%
- Battery backup system for solar energy storage

PASSIVE COOLING

- Design of this building and the automatic controls within it provide cooling during the cooler seasons of the year
- Natural convection with a solar chimney. During the hottest days of the year, the house utilizes two-pass high efficiency equipment without compressors utilizing an adiabatic cooling process to condition the space.

HIGHLY EFFICIENT SYSTEMS

- The mechanical system is specifically designed to capture as much of the cooling energy as possible within the homes’ highly efficient insulated building envelope by locating the ductwork below the insulated roof in lieu of within the attic space as is typically done in newly constructed homes.

HERS Index

- 130: Existing Home
- 100: Standard New Home
- 33: Zero Energy Home

Energy Systems

- Future Solar Panels
- Energy Saving Appliances
- Energy Efficient Envelope
- Whole Home Backup
- Utility Meter
- Grid

Estimated Annual Energy Cost

- $286
- $240
- $597

Estimated Annual Energy Consumption

- 7.0
- 18.0