Energy Efficient
Affordable
Factory Built
Houses

Why it matters!

STEVEN LEFLER, Vice President
Newport Pacific/Modular Lifestyles
CA Building Standard Code

All Residential Houses must be Net Zero by 2020

CA. House Definitions

- **Title 24** - *Modular* = Site Built \(\text{IRC-CRC-FBH}\)
  Local Zoning Code

- **Title 25** = HUD code manufactured homes (manufactured home)
  - After 1976 = Manufactured home
  - Before 1976= Mobile Homes or Trailers
    (typically a City’s registered affordable housing community)
    Federal Building Code

- **ANSI code or RV code** = Tiny House <400 sq. ft.
  American National Standards Institute
House in Parking lot meets current zoning

- Recent Sonoma County Supervisors Changes

- Recreational vehicles already are allowed as a temporary residence for displaced persons on fire damaged lots. Under the urgency ordinance, manufactured homes also will be allowed as emergency housing on fire-damaged lots but must be removed before occupancy of a reconstructed primary residence unless the manufactured home is permitted as an accessory or junior dwelling unit.
The Concept

Solar to Battery to Electric Car
How to validate Energy Efficiency
Our CA. Building Envelope
Factory= Best Practices for building
Super Tight and Insulated to minimize heating and cooling loss

**Ceiling = R 48 w/Phase Change**

Add Foil Products

2x6 Wall w/Mineral Wool = R-23

Passive house standards (PHIUS)
Determine CEC’s - California Climate Zone Map
16 Climate Zones for home builders to reach Net Zero operation
Specific Envelope insulation requirements by Climate Zone

My Modular house

Star our houses location in Climate Zones
So does it work?
My 2014 Cavco Modular House
Paso Robles, CA Climate

- CA. Climate Zone = 5
- Summer  90 – 110 degrees
- Winter   25 – 45 degrees
- House stays 60 to 80 degree without HVAC (most days)
- 295 Days of Clear Sun or 70 days without it
2013 - Design Building Goals:
Home’s (TOU) operation
< 300 kWh per month a standard

- **TIER 1 Allowance = 278 kWh = allotment**

<table>
<thead>
<tr>
<th>Date Range</th>
<th>Tier 1 Allowance</th>
<th>Tier 1 Net Usage</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>05/11/2016 – 05/31/2016</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>195.30 kWh</td>
<td>(21 days x 9.3 kWh/day)</td>
</tr>
<tr>
<td>Tier 1 Allowance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak</td>
<td>-68.082000 kWh</td>
<td>@ $0.34166</td>
<td>-$23.26</td>
</tr>
<tr>
<td>Part Peak</td>
<td>-30.529000 kWh</td>
<td>@ $0.22639</td>
<td>-6.91</td>
</tr>
<tr>
<td>Off Peak</td>
<td>100.663000 kWh</td>
<td>@ $0.14961</td>
<td>15.06</td>
</tr>
<tr>
<td><strong>06/01/2016 – 06/09/2016</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>83.70 kWh</td>
<td>(9 days x 9.3 kWh/day)</td>
</tr>
<tr>
<td>Tier 1 Allowance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak</td>
<td>-37.293000 kWh</td>
<td>@ $0.34166</td>
<td>-$12.74</td>
</tr>
<tr>
<td>Part Peak</td>
<td>-5.118000 kWh</td>
<td>@ $0.22639</td>
<td>-1.16</td>
</tr>
<tr>
<td>Off Peak</td>
<td>70.180000 kWh</td>
<td>@ $0.14961</td>
<td>10.50</td>
</tr>
<tr>
<td><strong>Energy Commission Tax</strong></td>
<td></td>
<td></td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Monthly NEM Charges</strong></td>
<td></td>
<td></td>
<td>-$18.50</td>
</tr>
</tbody>
</table>
Annual 2016 to 2017
Understanding Performance
By paying by the hour

<table>
<thead>
<tr>
<th>Bill Period End Date</th>
<th>Net Peak Usage (kWh)</th>
<th>Net Part Peak Usage (kWh)</th>
<th>Net Off Peak Use (kWh)</th>
<th>Net Usage (kWh)</th>
<th>Estimated NEM Charges Before Taxes</th>
<th>Estimated Taxes</th>
<th>Estimated Total NEM Charges</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/09/2016</td>
<td>-105</td>
<td>-35</td>
<td>171</td>
<td>30</td>
<td>-18.51</td>
<td>0.01</td>
<td>-18.50</td>
</tr>
<tr>
<td>07/11/2016</td>
<td>-10</td>
<td>27</td>
<td>257</td>
<td>274</td>
<td>41.23</td>
<td>0.08</td>
<td>41.31</td>
</tr>
<tr>
<td>08/10/2016</td>
<td>69</td>
<td>78</td>
<td>281</td>
<td>425</td>
<td>91.47</td>
<td>0.12</td>
<td>91.59</td>
</tr>
<tr>
<td>09/11/2016</td>
<td>29</td>
<td>54</td>
<td>268</td>
<td>351</td>
<td>65.17</td>
<td>0.10</td>
<td>65.27</td>
</tr>
<tr>
<td>10/10/2016</td>
<td>27</td>
<td>49</td>
<td>304</td>
<td>379</td>
<td>72.08</td>
<td>0.11</td>
<td>72.19</td>
</tr>
<tr>
<td>11/08/2016</td>
<td>0</td>
<td>27</td>
<td>199</td>
<td>228</td>
<td>35.49</td>
<td>0.08</td>
<td>35.55</td>
</tr>
<tr>
<td>12/08/2016</td>
<td>0</td>
<td>74</td>
<td>439</td>
<td>513</td>
<td>81.58</td>
<td>0.15</td>
<td>81.73</td>
</tr>
<tr>
<td>01/09/2017</td>
<td>0</td>
<td>71</td>
<td>581</td>
<td>652</td>
<td>109.34</td>
<td>0.19</td>
<td>109.53</td>
</tr>
<tr>
<td>02/09/2017</td>
<td>0</td>
<td>70</td>
<td>514</td>
<td>584</td>
<td>95.35</td>
<td>0.17</td>
<td>95.52</td>
</tr>
<tr>
<td>03/12/2017</td>
<td>0</td>
<td>52</td>
<td>274</td>
<td>325</td>
<td>52.31</td>
<td>0.10</td>
<td>52.41</td>
</tr>
<tr>
<td>04/10/2017</td>
<td>0</td>
<td>34</td>
<td>50</td>
<td>84</td>
<td>14.99</td>
<td>0.02</td>
<td>15.01</td>
</tr>
<tr>
<td>05/10/2017</td>
<td>-12</td>
<td>15</td>
<td>32</td>
<td>35</td>
<td>3.81</td>
<td>0.01</td>
<td>3.82</td>
</tr>
<tr>
<td>TOTAL</td>
<td>-2</td>
<td>513</td>
<td>3370</td>
<td>3880</td>
<td>$645.31</td>
<td>$1.12</td>
<td>$646.43</td>
</tr>
</tbody>
</table>
Supplemental Energy – Propane

$90.00 Annual cost to operate
What are your Solar Choices?

BIPV Shingles, Accessory Solar Panels or Community Solar Carports
Factory Installation of the Solar Roof Shingles
Solar + Batteries + Generator
Two Models - 2011 and 2014

Power System
3.0 kWh Solar Panels
Inverters
Software
Batteries

-----------------
$22,500

Tiny House $52,000

6.0 kWh Generator = $4,100.00
Building a Green Community - 2008-2014
Oak Haven 62+ Senior Community, Ojai, CA
18 of 22 homes Solar Powered / Energy Star

“Master Meter” Community
Electrical Cost to operate
Over $15,000 monthly

1885 Maricopa Highway Ojai, CA.
Latest Residential Off-The-Grid Modular home Ojai, CA.
The best way to predict your future is to create it.

Abraham Lincoln