### Florida Energy Systems Consortium 2014 Workshop



FLORIDA SOLAR ENERGY CENTER Creating Energy Independence

An Overview of Research Towards Zero Energy Ready Homes May 12, 2014

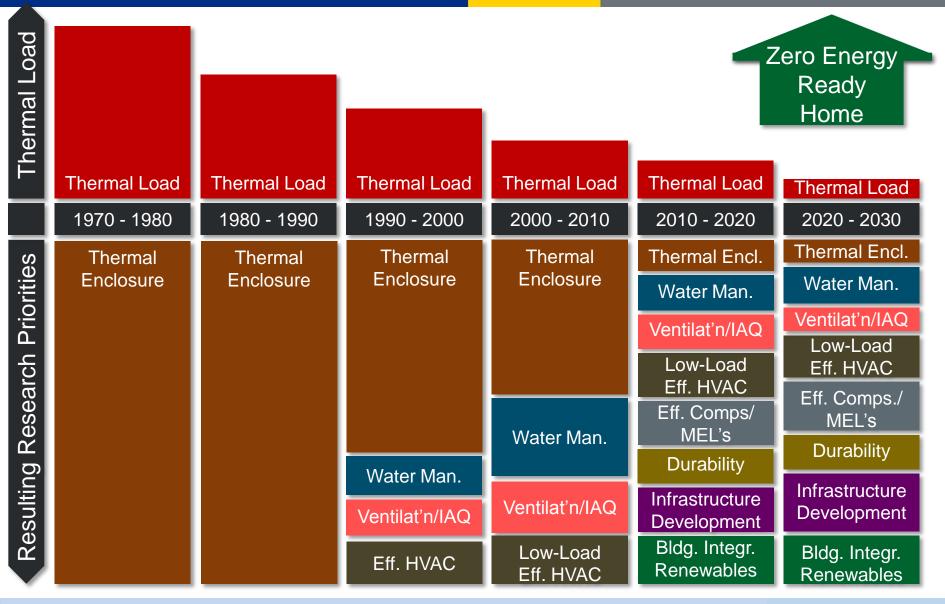


## **Eric Martin**

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# **Building America ZERH Roadmap**

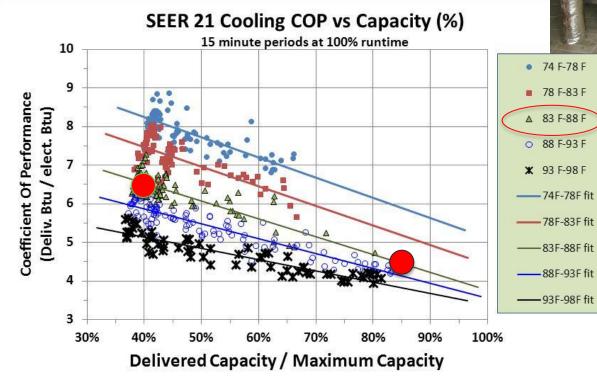




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Variable Capacity HVAC (SEER 21-22) Variable Capacity HVAC (SEER 21-22)

 Characterization of new generation heat pump with variable compressor enabling variable capacity of 40-118% of nominal.





Fixed Capacity SEER 13

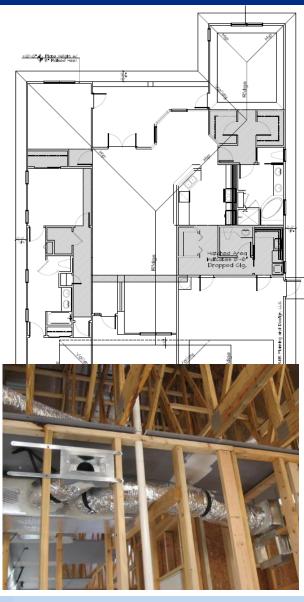
Variable Capacity SEER 21

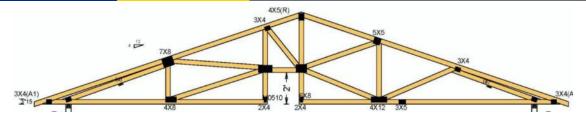
- Variable capacity system 46% more efficient at minimum capacity vs. nominal!
- Oversizing leads to better efficiency with no reduction in performance.
- Extended runtime increases thermal and leakage losses in ductwork vs. fixed capacity.

### **Interior Duct Systems**

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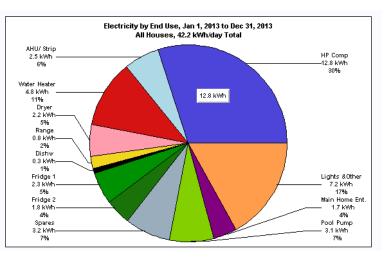
## **Phased Deep Retrofits**

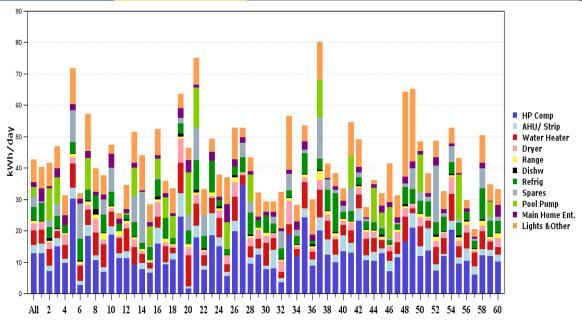


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#### **Shallow Retrofits (9%)**

- CFL / LED Lighting
- DHW tank wrap
- Clean fridge coil
- Showerhead
- Pool pump timer
- Smart power strip
- 2 year simple payback •

### Deep Retrofits (>40%)

- SEER 16 heat pump
- NEST thermostat
- Duct Sealing
- Heat pump DHW
- Variable sp. pool pump
- R-38 ceiling insulation
  - Energy Star appliances