

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



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Program Director

Partnership for Improved Residential Construction

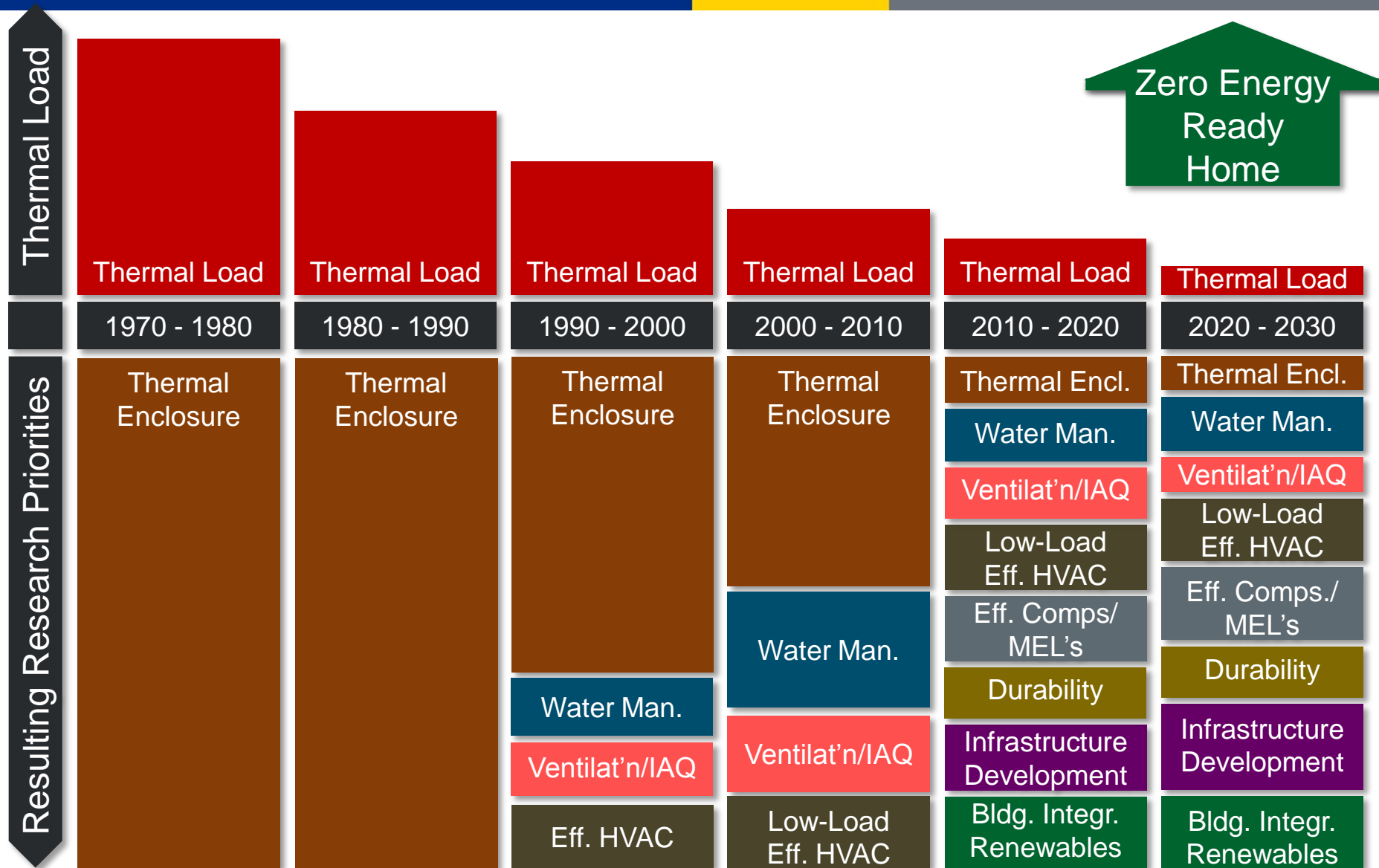
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Building America ZERH Roadmap



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Variable Capacity HVAC (SEER 21-22)



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

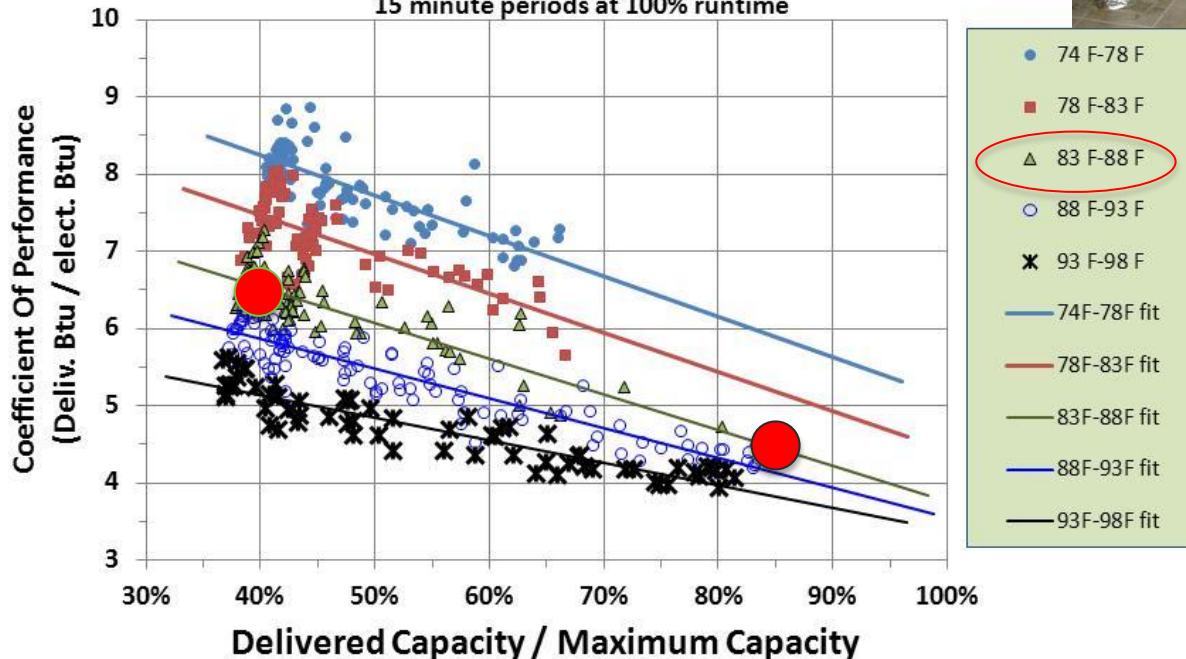


Fixed
Capacity
SEER 13

Variable
Capacity
SEER 21

SEER 21 Cooling COP vs Capacity (%)

15 minute periods at 100% runtime

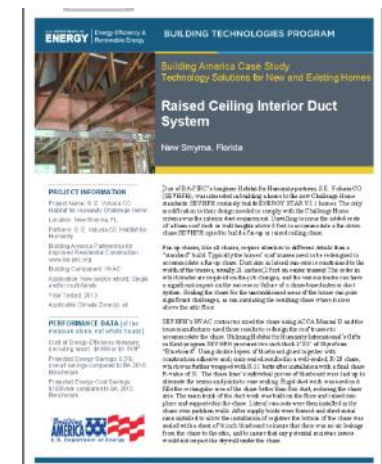
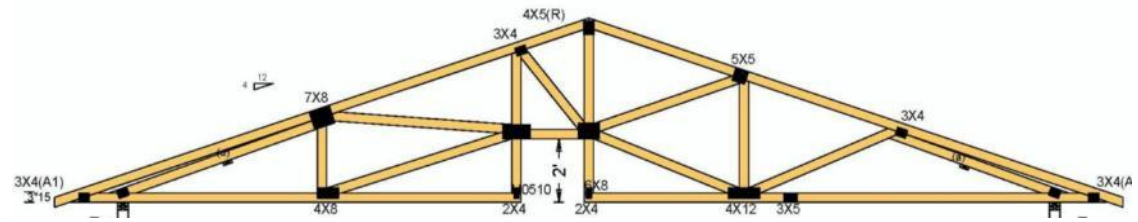
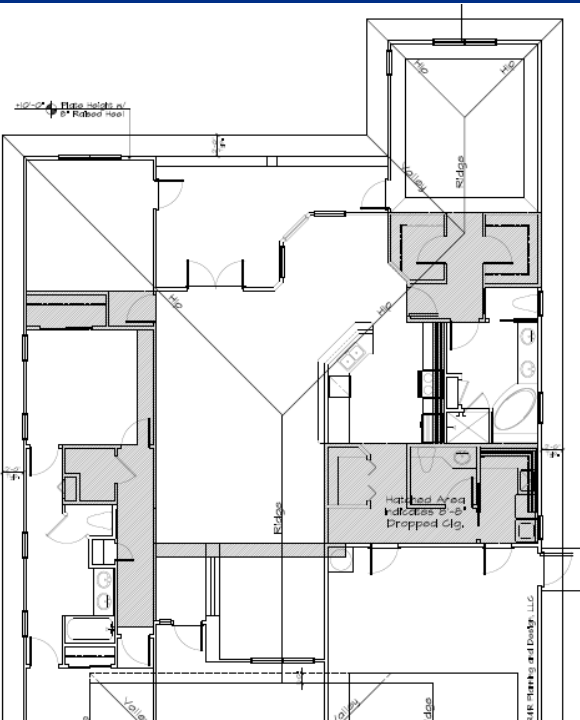


- Variable capacity system 46% more efficient at minimum capacity vs. nominal!*
- Oversizing leads to better efficiency with no reduction in performance.*
- Extended runtime increases thermal and leakage losses in ductwork vs. fixed capacity.*

Interior Duct Systems



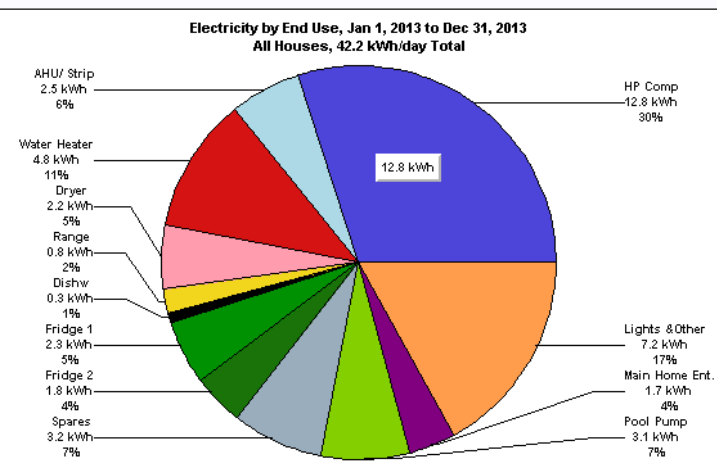
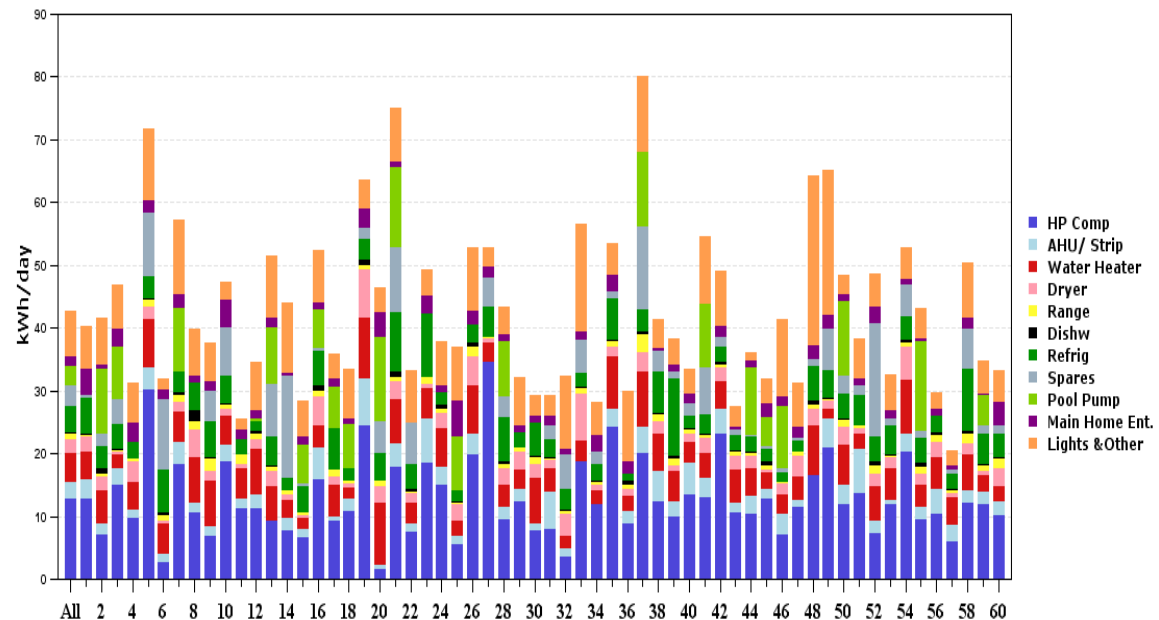
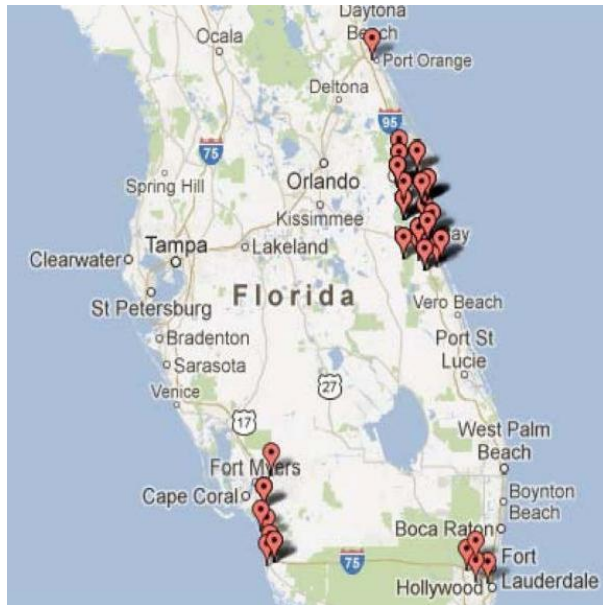
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Phased Deep Retrofits



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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