

U.S. DEPARTMENT OF
ENERGY

Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

Advanced HVAC Equipment Design Strategies for Optimal Efficiency and Humidity Control

Home Innovation Research Labs

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Advanced HVAC Equipment Design

Team Member	Role
Home Innovation Research Labs	Research, Integration, Coordination
Goodman Manufacturing	Product Development
Aprilaire® Research Products	Ventilation
Wrightsoft®	Software
Air Conditioning Contractors of America	Trades and Quality Assurance
National Association of Home Builders	Builders
K. Hovnanian Companies	Production Builder
David Weekley Homes	Production Builder
AB Systems, LLC	Expert

The broad team of key stakeholders includes the entire channel to market for design and construction to help

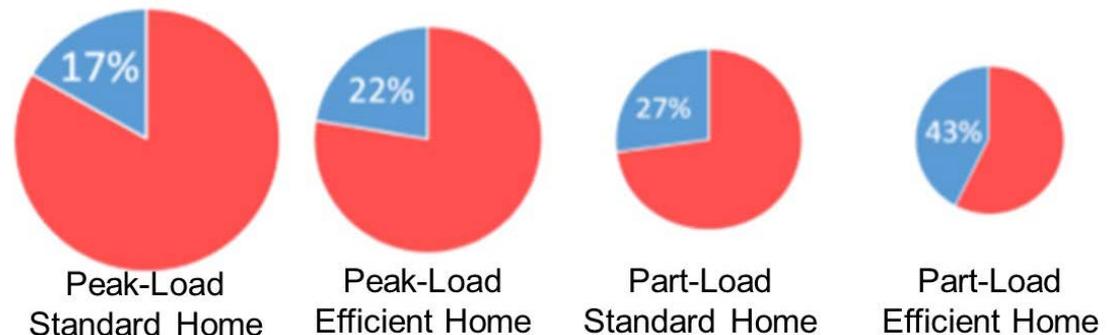
1) garner input and 2) facilitate delivery/adoption

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The Problem (The Need/Challenge)

- High performance homes face unique space conditioning challenges in humid climates
- Current HVAC solutions are a piecemeal of three independent systems—AC, ventilation, RH control—that don't talk to each other
- Result: comfort issues, energy penalty, high first cost

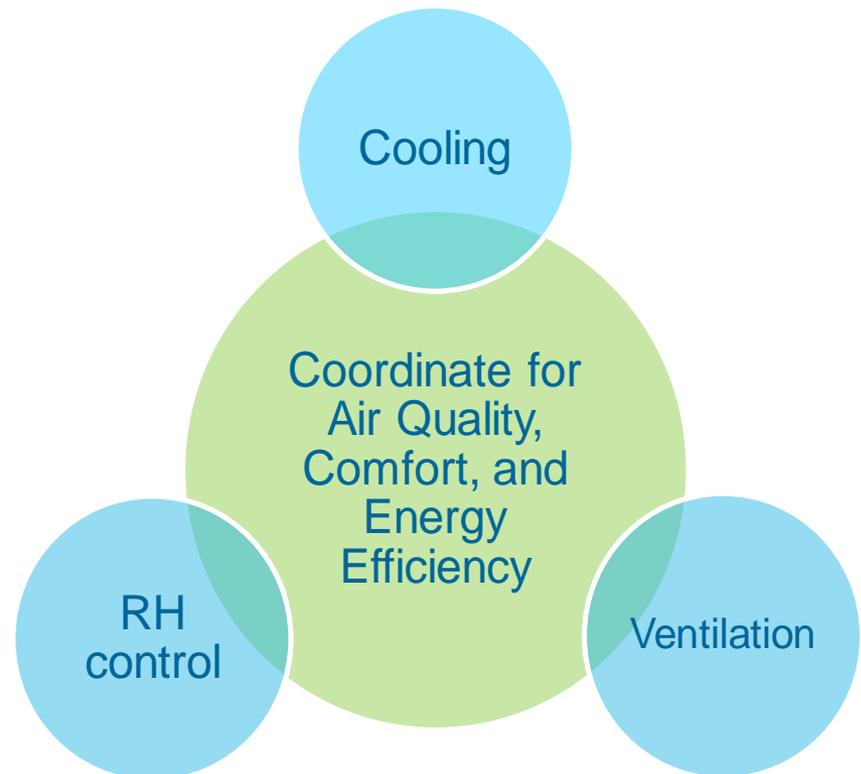
Example latent load as a percentage of total load



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The Solution

- A coordinated comfort system designed and optimized with dehumidification as one of the key variables
 - ❑ Central system
 - ❑ Standardized “next-gen” enhanced dehumidification
 - ❑ Prioritized ventilation
 - ❑ Integrated controls



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Advantage and Differentiation

- **Improved Energy Efficiency** (minimized need for suppl. dehumidification; on-cycle ventilation)
- **Improved Comfort** (no overcooling; outdoor air mixing with conditioned air)
- **Reliance on more standard solutions redesigned/ /reconfigured/controlled based on a new set of metrics**

Impact

- **Simplifies transition for builders and trades**
- **Addresses the largest barrier to adoption of high-performance homes in the south**
- **Production builder ready, field-validated solution**

Thank You

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