

Residential HVAC Energy Efficiency Trends

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Residential HVAC Energy Efficiency Trends



- Energy Efficiency Challenges and Innovations
- System Designs to Offset New Power Plant Construction
- Net Zero Energy Homes

Energy Efficiency Challenges and Innovations System Designs



	Seasonal Energy Use	Homeowner Comfort	Ease of Installation	Utility DR Advantage	Regional Applicability
Traditional Splits	Baseline	Baseline	Baseline	Baseline	Baseline
Ground Source Heat Pumps	+	Same	-	Same	"Middle" of Country
Water Assisted Cooling	+	-	Same	Limited	"West" (Assuming Water Access)
CEE Tier 3 Variable Speed Systems	+	+	Same	+	Broad Applicability

Energy Efficiency Innovation Opportunity Next Generation Controls



- **Smart zoning**
- **Intuitive operation**
- **Control from anywhere**
- **Intelligent**
- **Interactive**






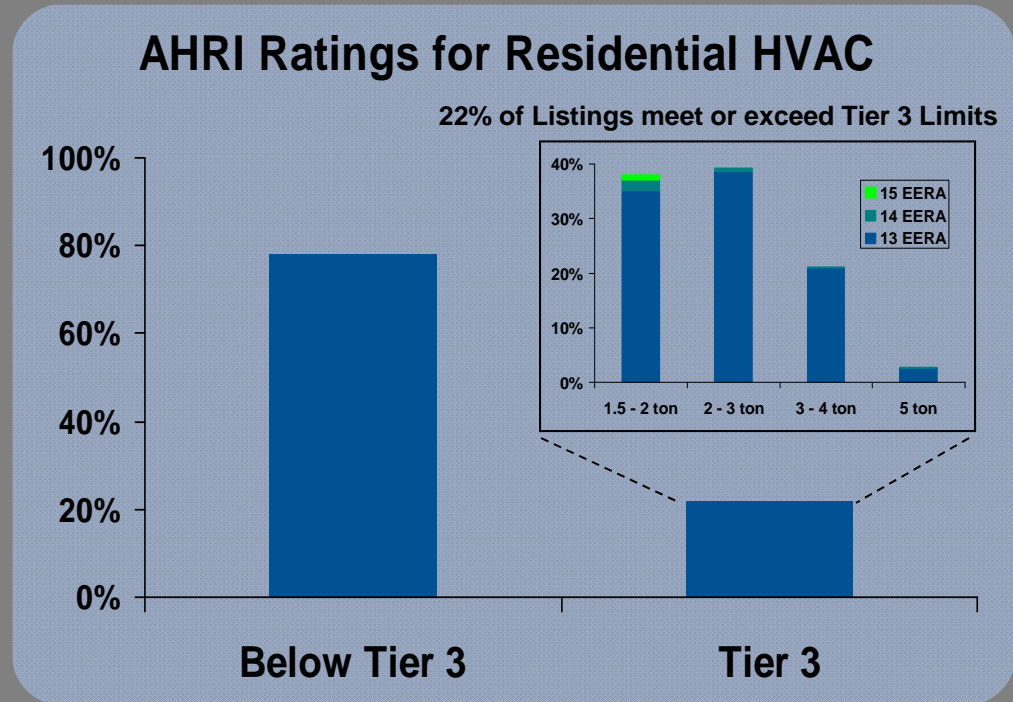
System Designs to Offset New Power Plant Construction

Peak Load Reduction - EER



- Equipment Implications of going beyond Tier 3 EER's

- Sizing 
- Cost 
- Materials / Refrigerant 

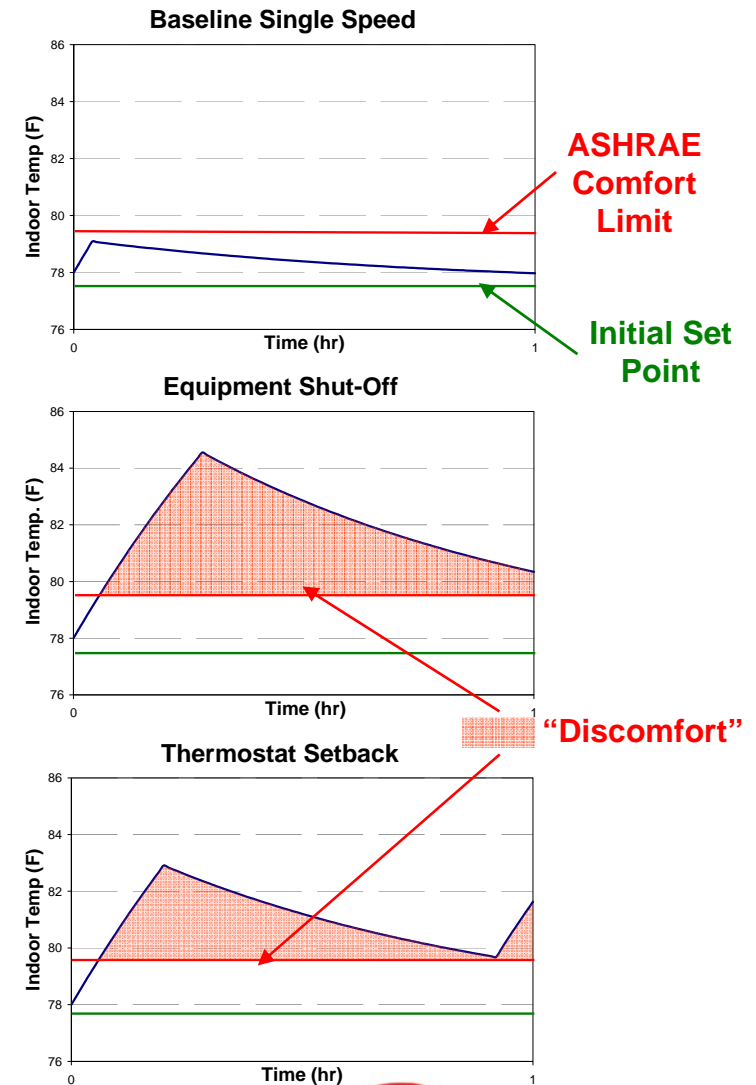


5 Ton 15 EER - Might Need Approx 7' High Outdoor Unit

System Designs to Offset New Power Plant Construction Peak Load Reduction - Demand Response



- **Modeling a DR Event**
 - Set Baseline Conditions
 - 13 EERA Equipment
 - Single Stage A/C
 - 100 deg F Day
 - Target 25% Energy Savings
 - Today's Technology
 - Equipment Shut-Off
 - T-Stat Set Back



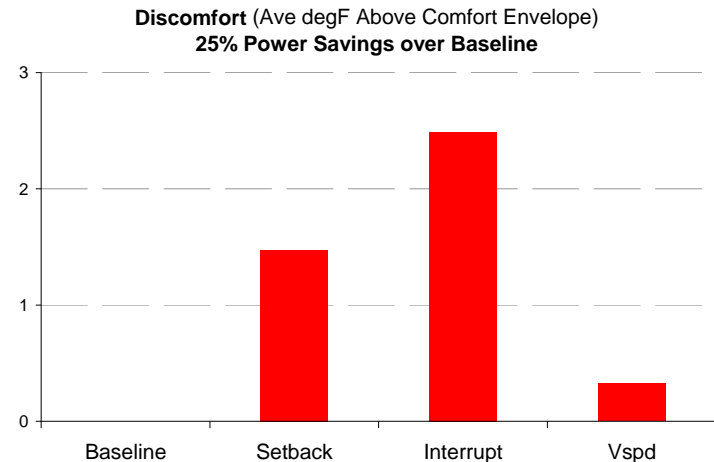
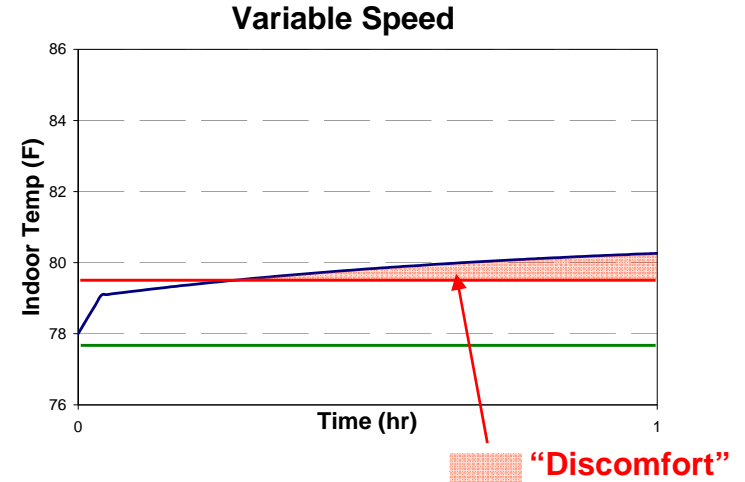
System Designs to Offset New Power Plant Construction Peak Load Reduction – Future System Opportunity



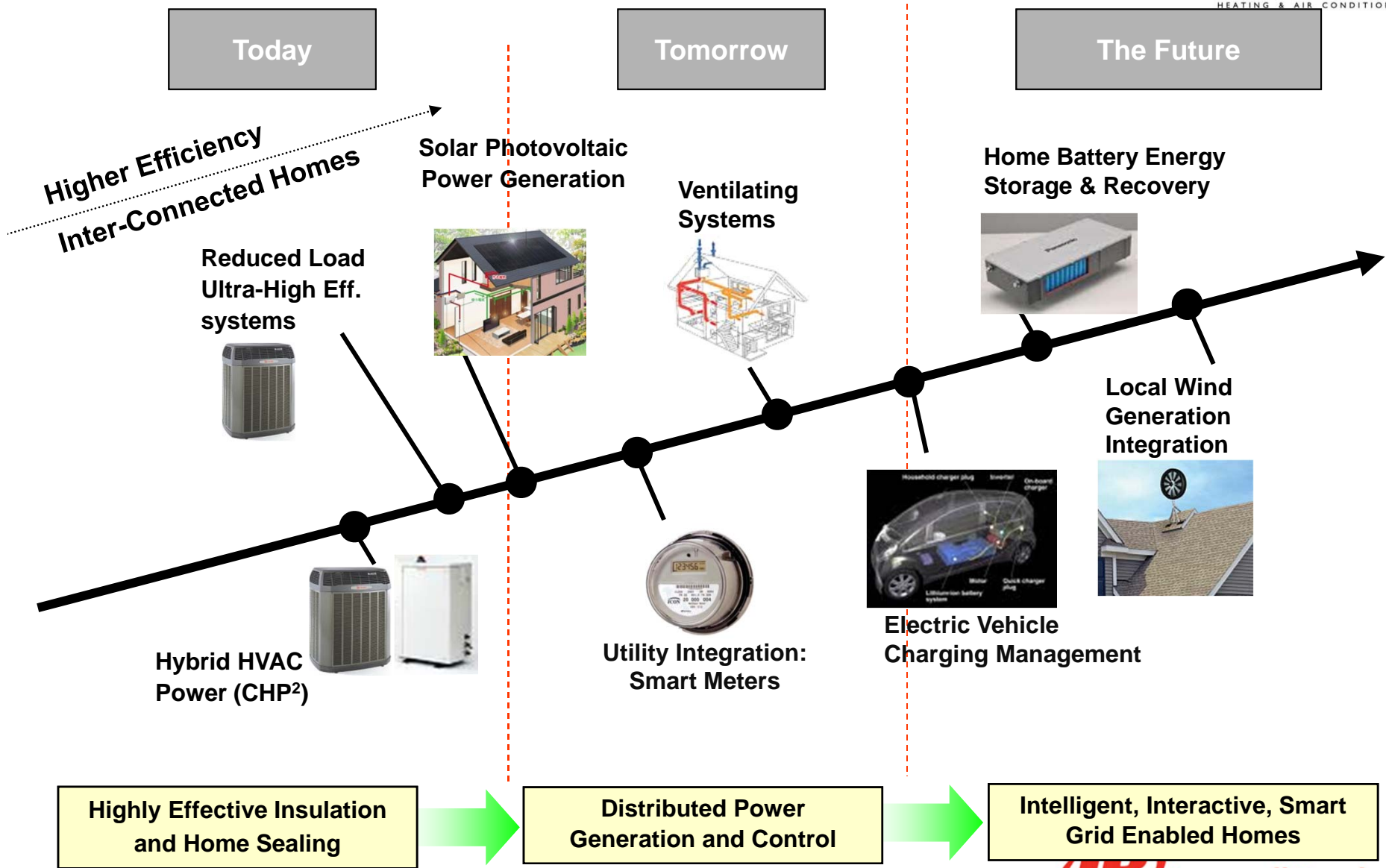
- **Variable Speed Systems**

- 13 EERA Equipment
- 100 deg F Day
- Same Sizing As Baseline

- Same 25% Load Reduction
- Significantly less “Discomfort” for the Consumer



Net Zero Energy Homes



Discussion