Smart Grid and DSM Programs:
Developing Demand-Response-Ready HVAC Systems

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Converging Trends
...that could change the game in utility programs

Growing interest in energy efficiency to reduce cost, carbon, and surface pollution

Emerging/growing use of renewable energy sources: inherently variable

Rising public consciousness of the climate change and energy nexus

Growing utility peak loads

Available, low-cost natural gas

Rising public consciousness of the climate change and energy nexus
Emerging (and Maturing) Technologies
...that could facilitate a game change in energy

- Communication protocols (e.g., OpenADR 2.0)
- Highly efficient variable speed a/c systems
- Thermal and battery storage systems
- Small, clean combined heat and power systems
- Smart water heaters capable of energy storage
- Smart grid and smart meters
These Convergences are Creating New Possibilities

- Sharply increased energy efficiency and energy productivity to reduce carbon and strengthen the economy

- Enhanced control of peak loads: Defers need to build generating plants

- More distributed generation: Less stress on transmission grids, less heat wasted to the atmosphere or rivers

- Potentially changing the roles of electric utilities
AHRI Initiatives: Smart/Connected Equipment Committee

- Developed concept of “Demand Response Ready” variable capacity HVAC equipment

- Higher efficiency: 18 to 20 SEER/IEER now practical

- Superior DR performance (efficiency increases when unloaded)

- Ready to connect (via OpenADR 2.0, for example)

- No truck rolls or field modification

- Increases cost effectiveness of DR programs

- Less impact on building occupant comfort
AHRI Initiatives: Smart/Connected Equipment Committee

- **Needs** to facilitate DR-ready equipment
  - Standardized performance during DR event
  - Aligned communication methods
  - Integrated EE and DR utility programs to recognize the full value and create appropriate incentives to homes and buildings
  - Approaches to include older legacy DR communication and operating protocols while they remain in use
AHRI Initiatives: Smart/Connected Equipment Committee

**Activity and status:**

- Started with interviews, meetings, and research
- Next developed white paper assessing the DR-ready concept
- Developed draft DR performance and communication spec (not a proposal, but a strawman for discussion)
- Strong collaboration among manufacturers and utilities, as well as among AHRI, CEE, and EPRI
- Convened two joint meetings co-sponsored by AHRI and CEE to evaluate and refine spec
Thank you!

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