Breaking Out the New Moves: How Resource Flexibility Benefits Utility Operations Panel

Grid Interactive Efficient Buildings

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https://www.energy.gov/eere/buildings/geb
Energy use in the U.S. building sector

**Energy Use**
- Transportation: 27 Quads (0.4% Electric)
- Industrial: 31 Quads (31% Electric)
- Residential: 21 Quads (72% Electric)
- Commercial: 18 Quads (80% Electric)

**Building Electricity Use**
- Cooling: 4%
- Heating: 5%
- Water Heating: 10%
- Lighting: 11%
- Refrigerators: 3%
- Cooking: 2%
- Electronics: 10%
- Other Residential Appliances: 4%
- Other: 3%

**Buildings Energy Use:** 40% of U.S. total
**Buildings Electricity Consumption:** 75% of U.S. total
**Buildings Peak Electricity Demand:** ~80% of regional total
**U.S. Building Energy Bill:** $380 billion per year

Source: EIA 2017 Annual Energy Outlook
“When” matters for some regions/loads more than others

Hourly Residential Cooling Cost Totals by Climate Zone in 2018 (May-Sep)
Interoperable, integrated systems.
- Continuously optimized operation for maximum comfort and efficiency.
- Grid-responsive (e.g. demand response).

Utility Communication

Applicable to Other Technologies, e.g.:

- Sensor/Occupant Inputs
- Control Signal
- Utility Communication

U.S. DEPARTMENT OF ENERGY OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY
Impact on a Building’s Energy Use