



Role of Building Technicians in Ensuring Persistence of Savings from Commissioning

NSF BEST Center - National Workshop

High Performance Building Technician Education:
Skill Requirements and National Certification

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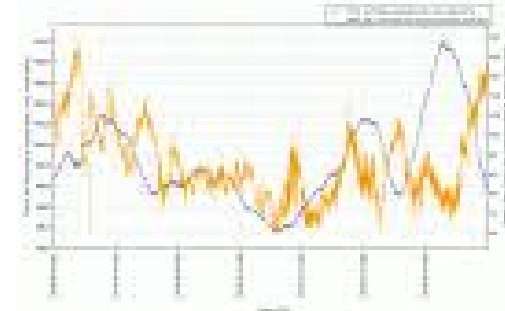
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For More info see Mills website- <http://cx.lbl.gov>

Facility Technicians Have a Key Role in Success of Commissioning

- Review building systems design intent documents
- Provide access to historical data, energy and control systems trend logs
- Help evaluate patterns of energy and non-energy issues identified and addressed in the commissioning process
- Design history of maintenance issues
- Track implementation of measure fixes
- Help track savings data to evaluate performance changes in systems

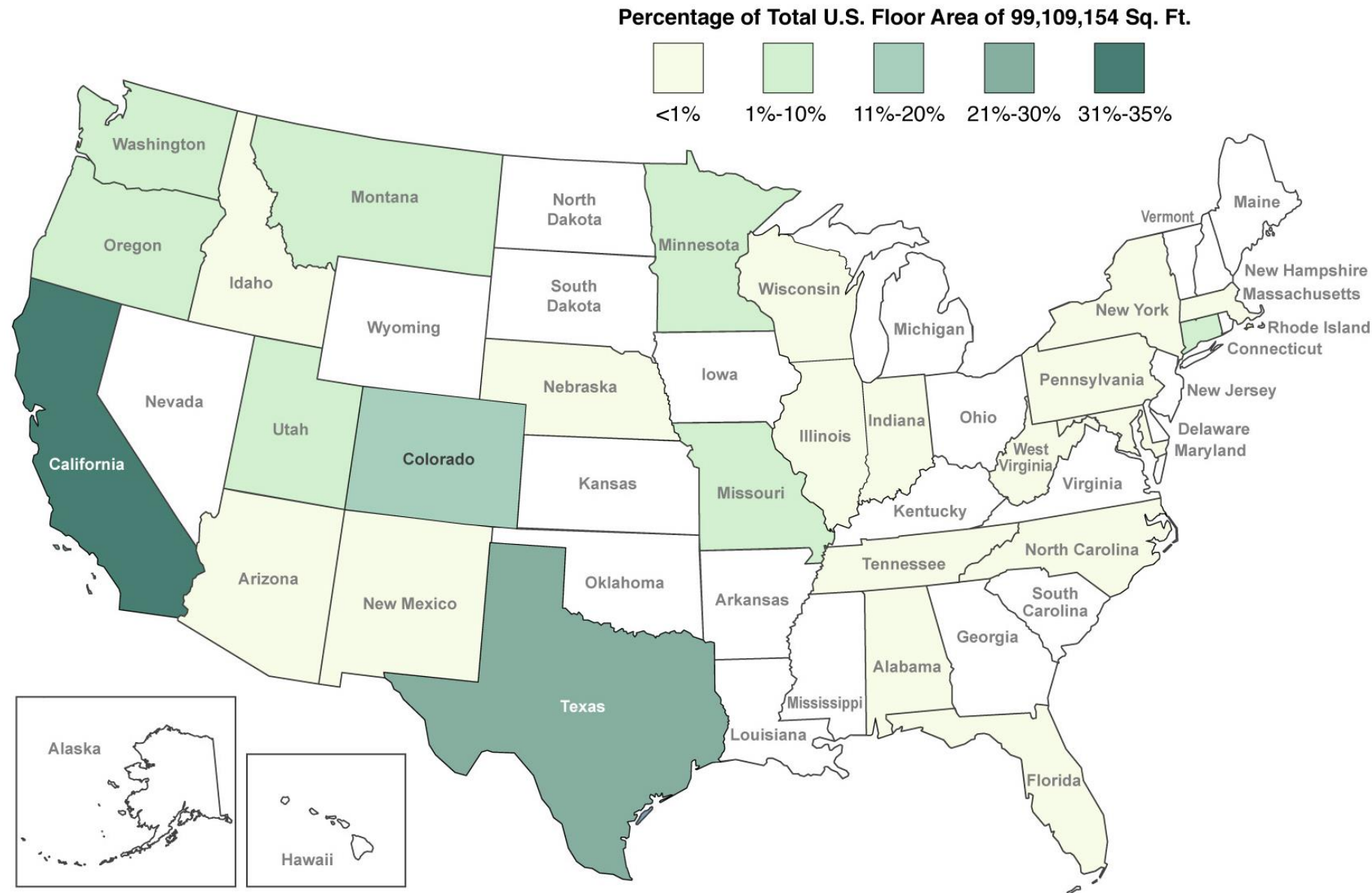


Mills Study on Making the Business Case

- Gather data on actual commissioning projects in new and existing buildings
- Remove uncertainties regarding the savings and cost-effectiveness of commissioning new and existing commercial buildings
- Document patterns of energy and non-energy issues identified and addressed in the commissioning process
- Perform a standardized analysis of energy savings, carbon reductions, and cost-effectiveness
- Estimate the national (U.S.) savings potential and required job creation

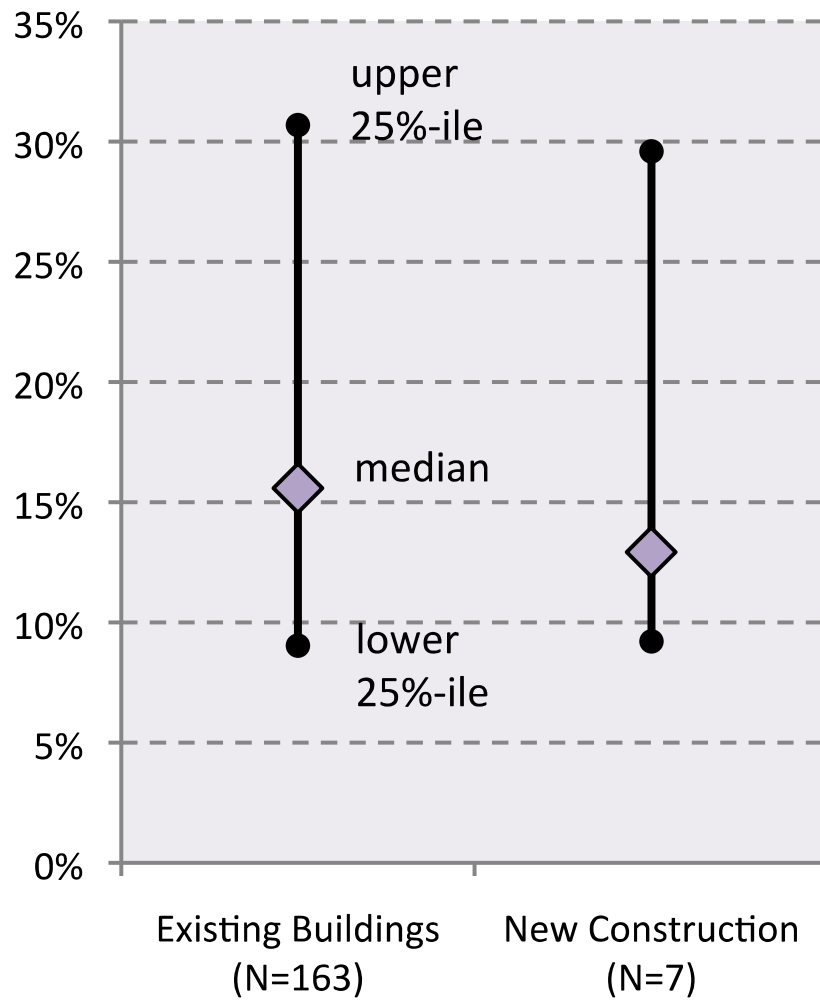
LBNL National Study

- 643 buildings
 - 562 existing
 - 82 new
- 19 building types
- 99 million square feet
- \$43 million investment
- 26 states
- 37 Cx providers

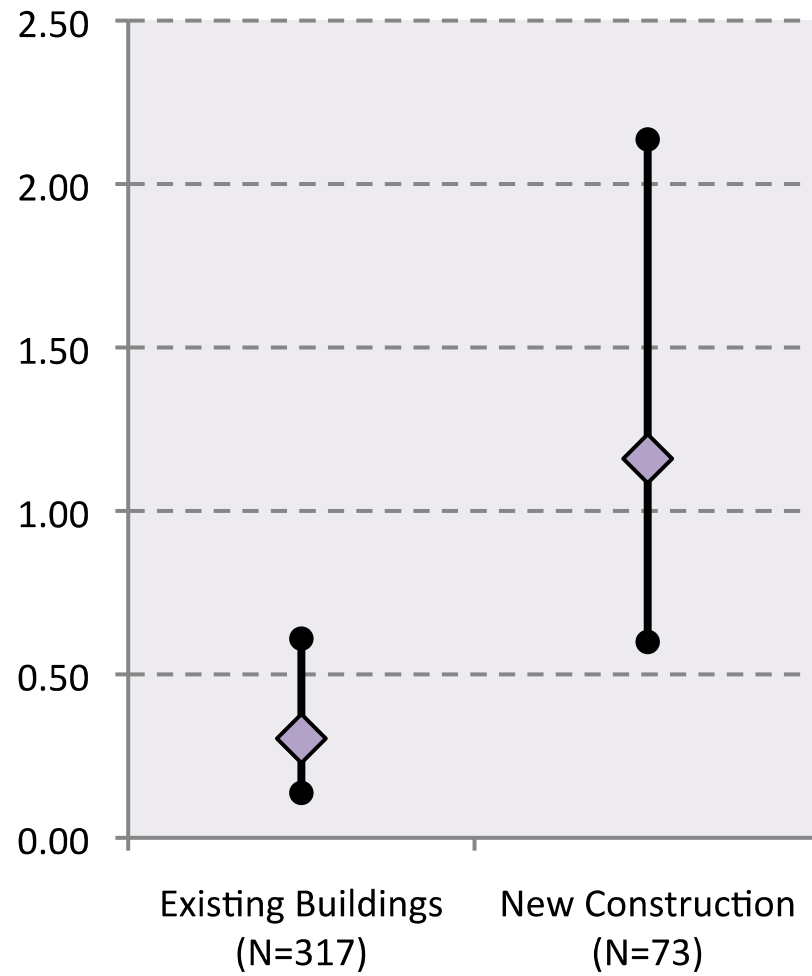


Performance Benchmarks

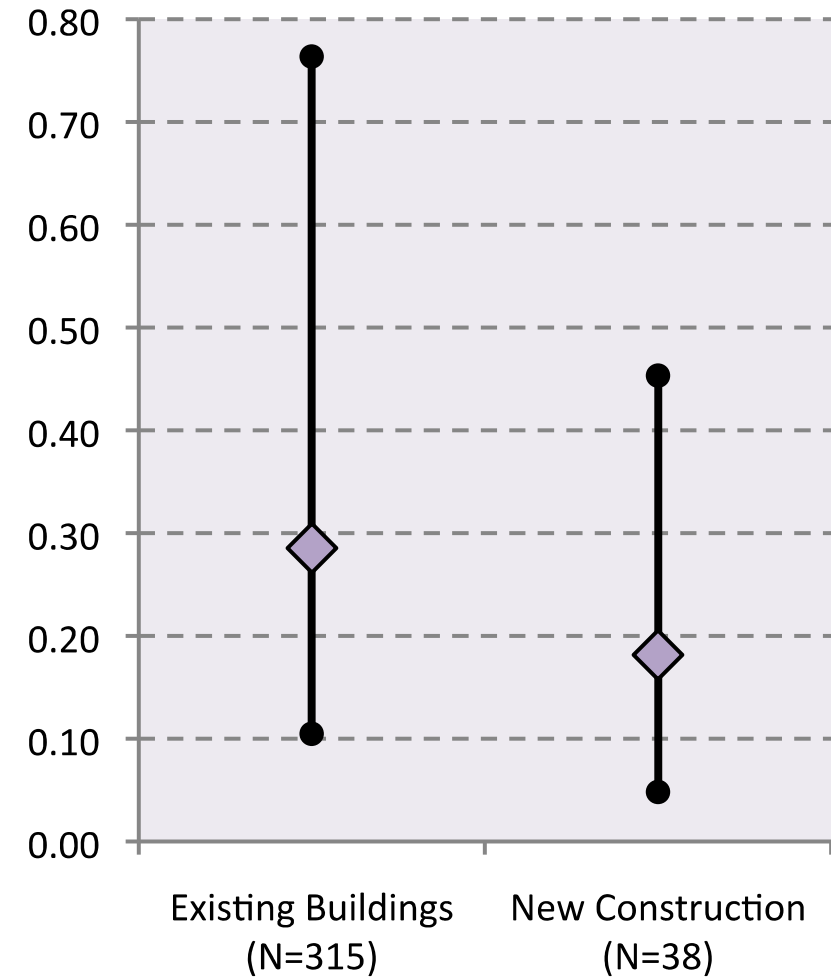
Energy Savings (%)



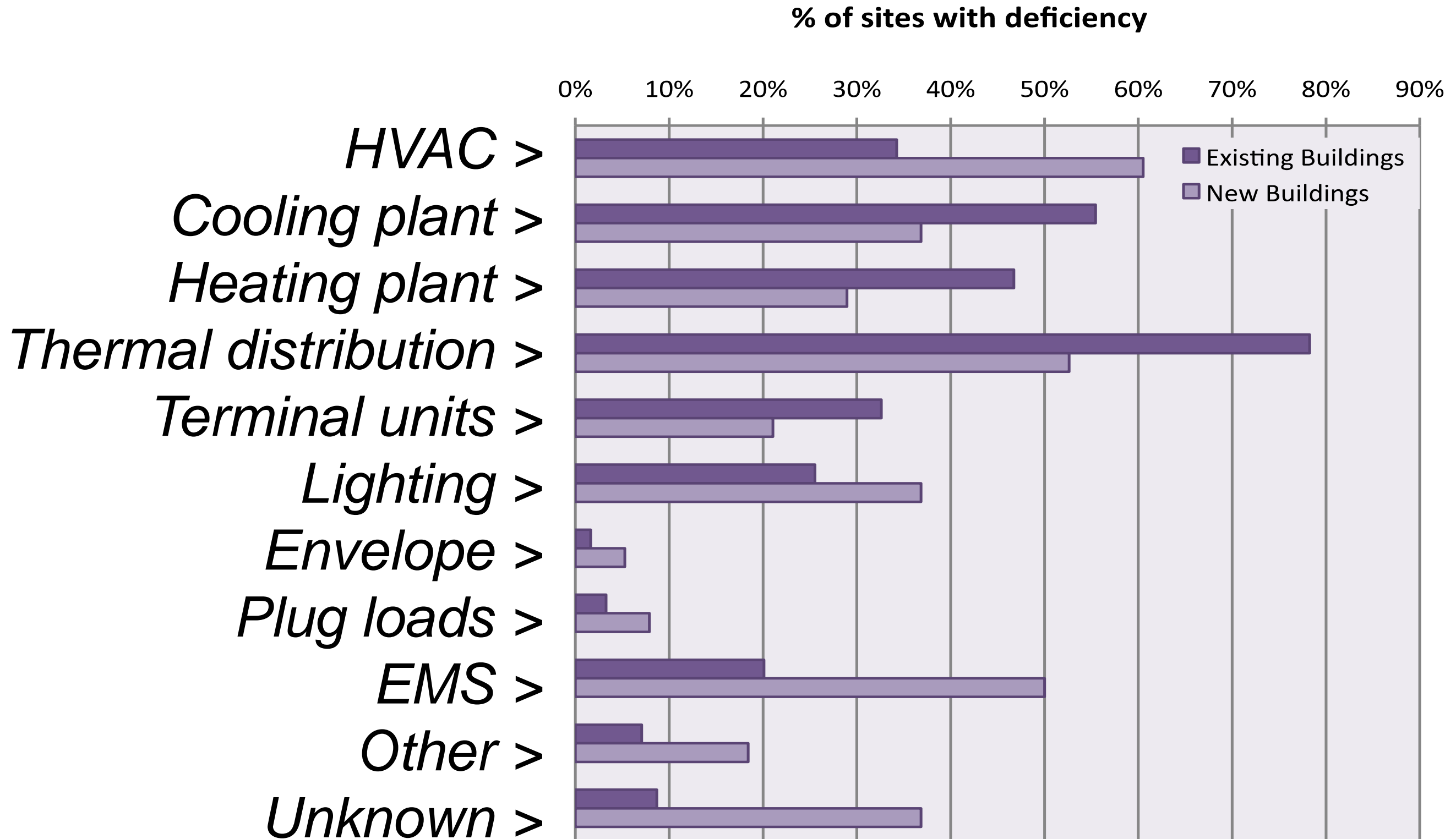
Commissioning Cost (2009 US\$/ft²)



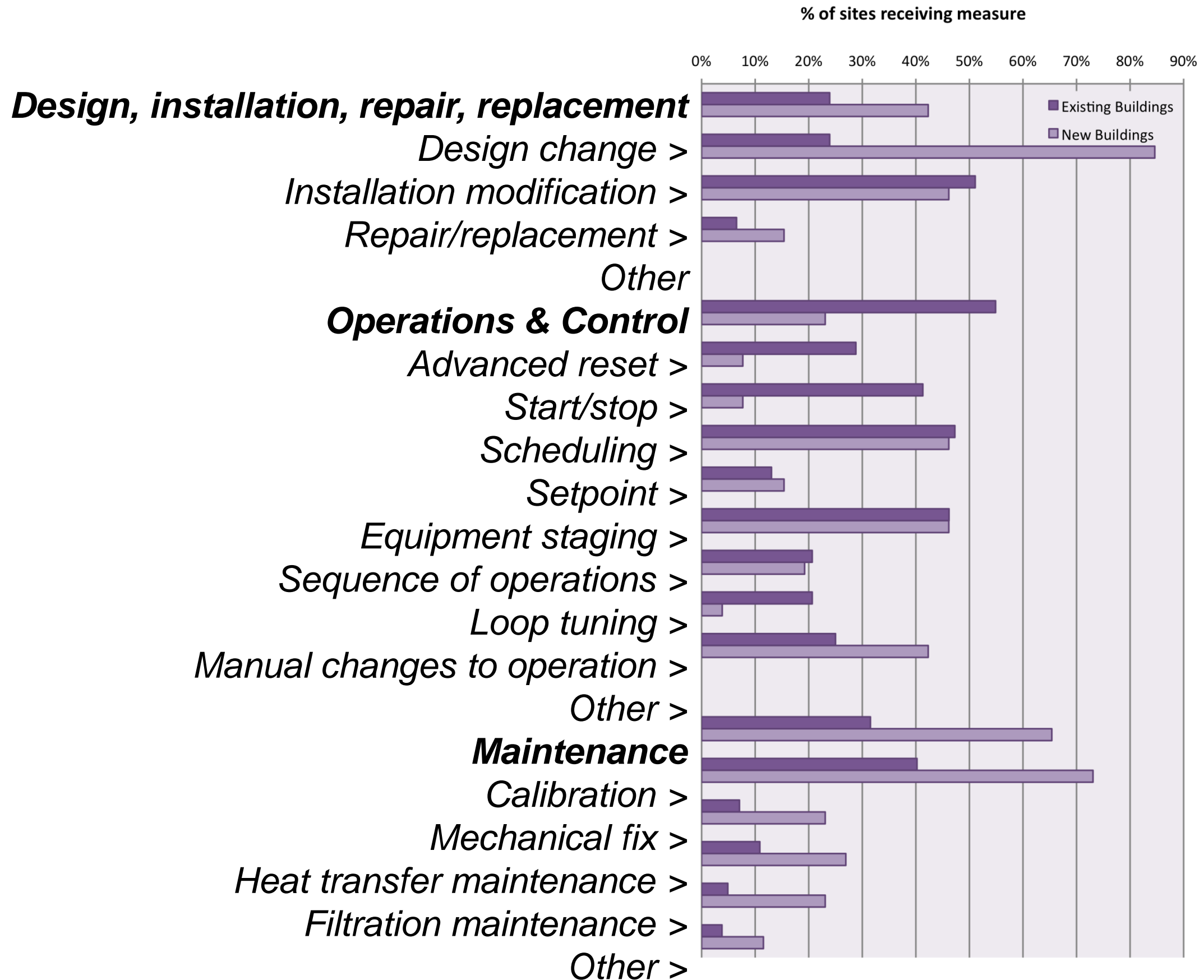
Cost Savings (2009 US\$/ft²-y)



Deficiencies Discovered ...



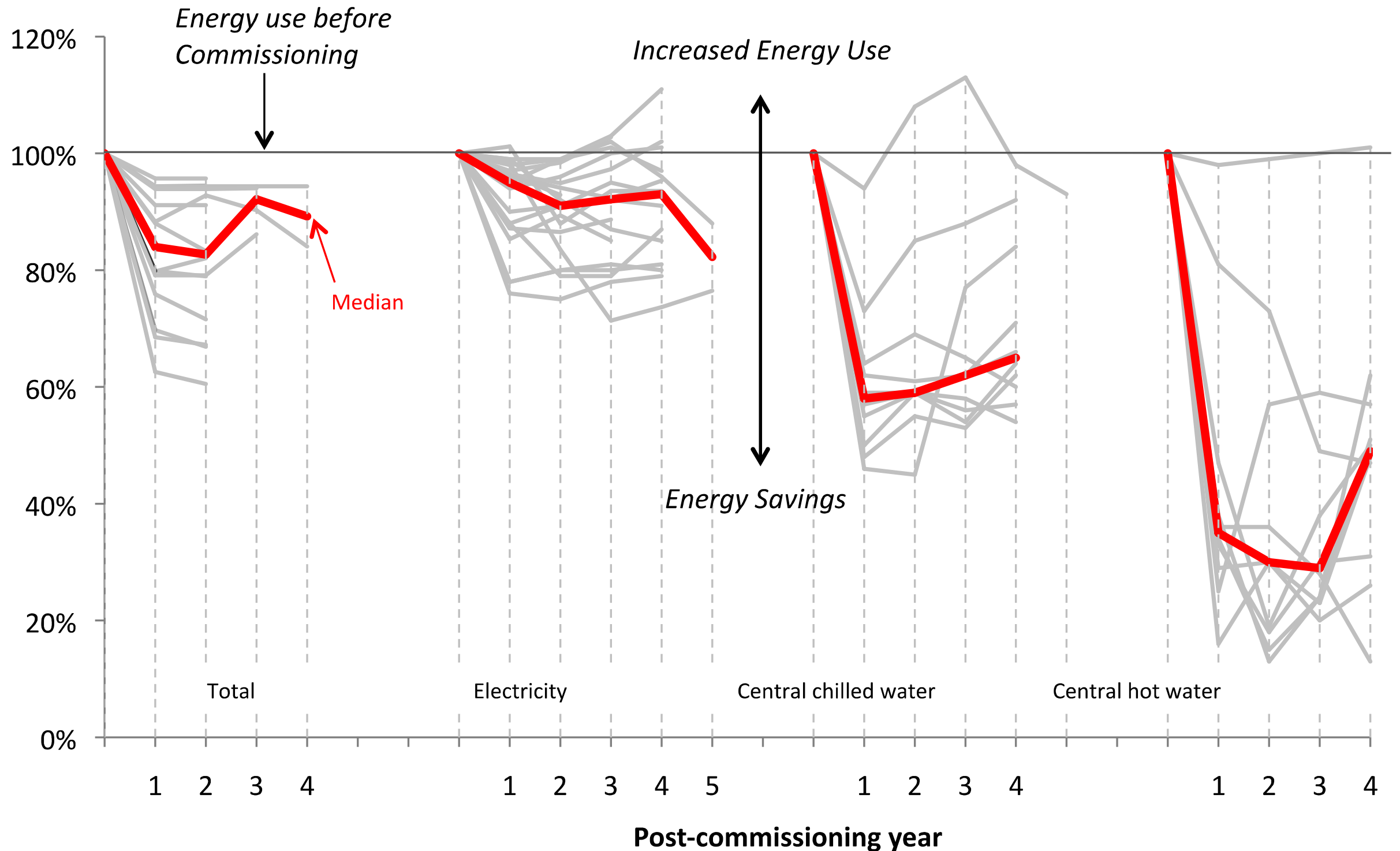
Measures to Correct Them



Savings Persistence

N = 36 projects

(Consumption as % of base year)

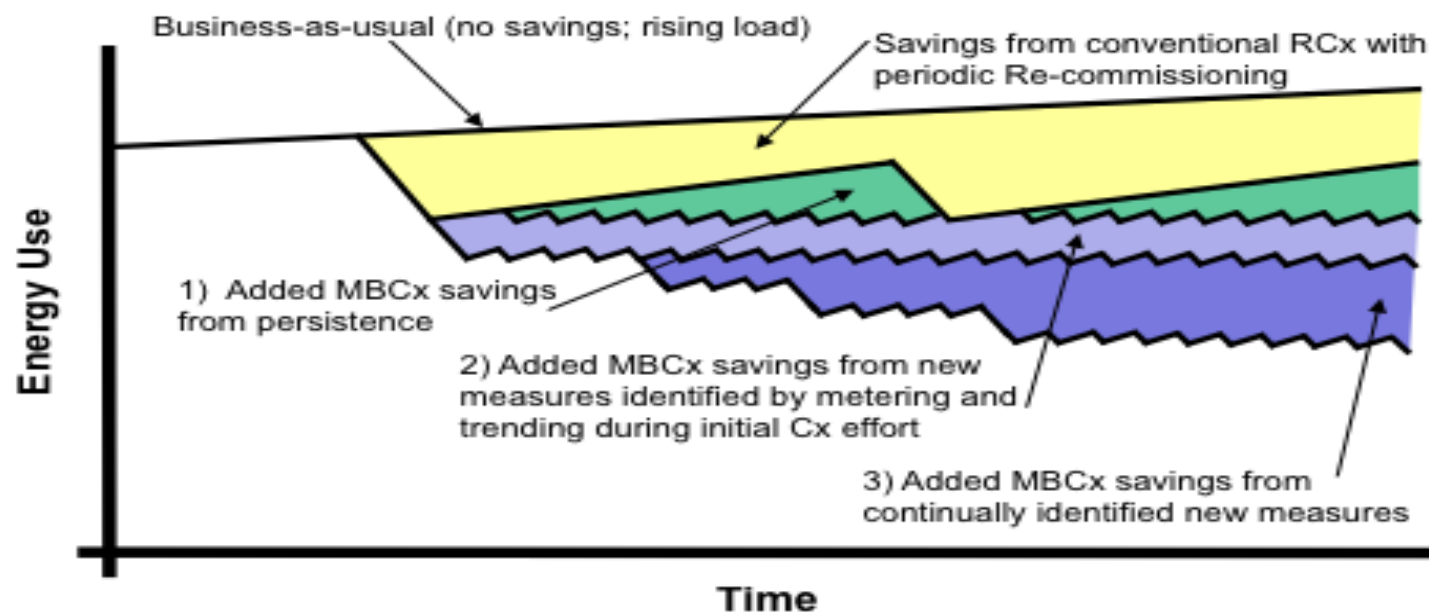


Key Findings (1 of 2)

- Commissioning is most cost-effective strategy for reducing energy, costs, and greenhouse-gas emissions in buildings.
 - Median costs: \$0.30/ft² and \$1.16/ft² for existing buildings and new construction, respectively
 - Median whole-building energy savings: 16% and 13%.
 - Median payback times: 1.1 and 4.2 years.
- Energy savings persist over a 3- to 5-year timeframe. Data over longer time horizons are not available.
- Non-energy benefits extensive and often offset of costs.
- Large reductions in greenhouse-gas emissions are achieved, at a negative cost of -\$110 and -\$25/tonne CO₂-equivalent.

Key Findings (2 of 2)

- There is an annual energy-savings potential of \$30 billion by the year 2030, and 360 MT CO₂-eq emissions reductions.
- The corresponding future industry would have a sales volume of \$4 billion per year
- Approximately 24,000 jobs need to be created in order to deliver the potential. This is “small” in the context of the number of people currently employed in related trades.



Summary: Role of Technician in Ensuring Savings

- Technician is key to identify performance issues associated with malfunctioning equipment, or poorly functioning controls
- Schedules, set points critical to commissioning
- Technician critical role in tracking definitions of design intent and evaluating appropriateness of changes in HVAC and lighting systems
- Commissioning can be short term project but savings require persistent attention to key system issues
- New tools, IT are available to assist technicians in collecting, organizing, tracking and evaluating energy use and trend log data

