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Benchmarking: What's your building's energy IQ?

Andrea Mercado

Senior Research Associate

Lawrence Berkeley National Laboratory

ACMercado@lbl.gov



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Why benchmark energy use?

Energy benchmarking is one part of a broader energy management process

- Establish baseline and track performance
- Validate design
- Identify best practices; set goals or standards
- Identify savings potential
- Prioritize efforts
- Identify maintenance and control problems



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Benchmarking Metrics

- Energy
- Fuel
- Peak Power
- Cost
- Emissions
- Equipment performance



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Benchmarking Approaches

- **Statistical** – where you stand against a population
- **Point-estimates** – how you measure against a population average
- **Point-based** – how you compare against best practices
- **Model-based** – how you perform against an efficient system
- **Standardized** – how you score during a test procedure



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Normalization

- **Weather** – compare to other regions
- **Climate** – compare to historical climate variances
- **Floor Area** – energy use per unit of floor area
- **Schedule / Occupancy** – energy use per hours of operation or number of occupants
- **Plug loads** – energy use per number of PCs or other equipment loads
- **Others** – number of rooms in lodging, number of meals in food service, number of beds in hospitals



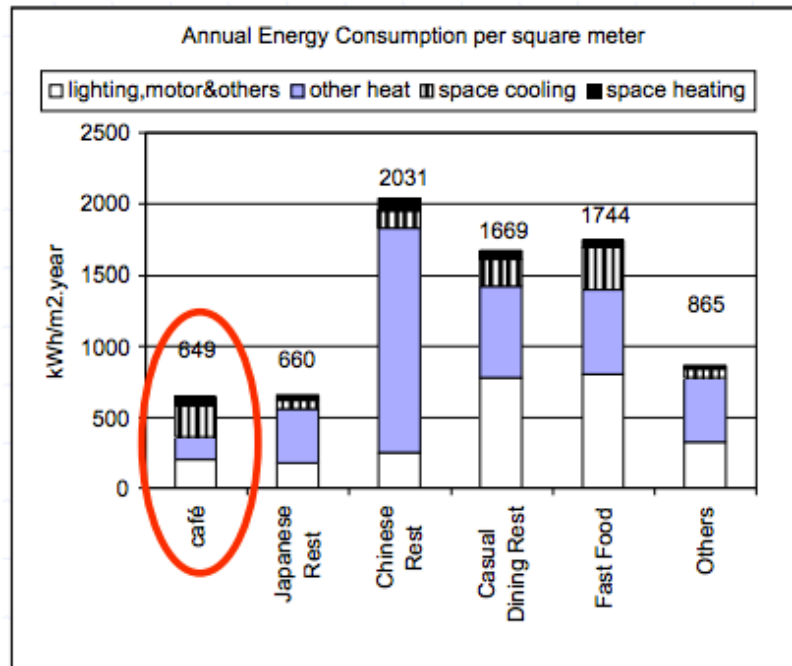
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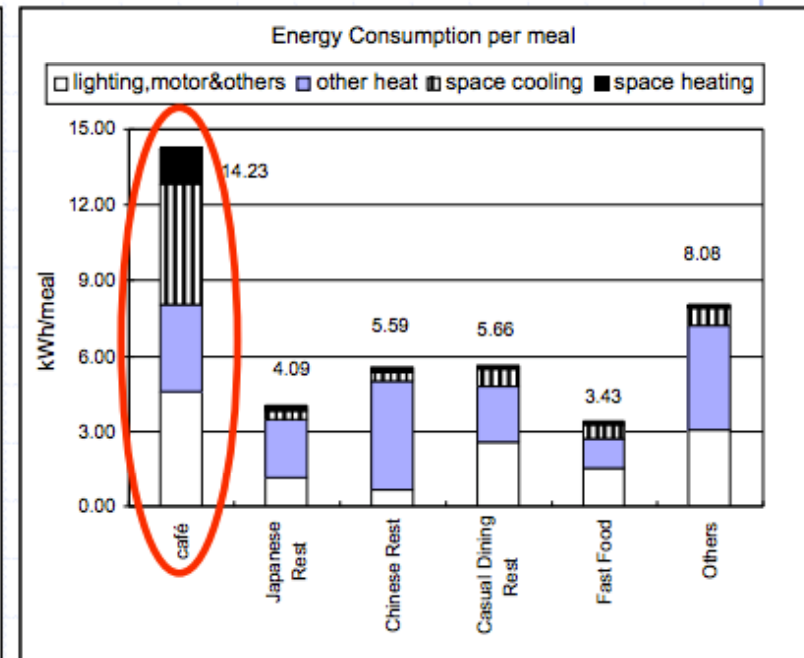
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Normalization is key

Energy per unit floor area



Energy per meal



Café ranks “best” by floor area and “worst” by meals

Source: The Energy Data and Modeling Center, 2001



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Data Collection

- Energy use
 - Annual
 - Monthly
 - Fuel
 - End Use
- Building Type
- Location
- Gross floor area
- Characteristics



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EnergyIQ

www.energyiq.lbl.gov

- Commercial benchmarking
 - California and national database
- Annual energy use data tracking
 - Import from Portfolio Manager
- Actionable recommendations for reducing energy use and carbon emissions
- Methodology available through API



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Portfolio Manager

www.energystar.gov/benchmarking



- Commercial and multifamily benchmarking
 - National database
- Monthly energy and water use data tracking
 - Meter-level
- Custom reporting
- Recognition Program
- Well-used and compatible with other industry tools



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DOE BPD

www.bpd.lbl.gov



- Commercial and residential benchmarking
 - Empirical national database
- Detailed filtering capabilities
- Interactive retrofit analysis app
 - Savings probabilities based on an actuarial approach
- Characteristic-rich database available for API use



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Labs21 & Fabs21

- Building-type specific benchmarking
 - Laboratories
 - Fabrication Facilities
- Annual energy and water use tracking
- Dataset is made up of user-input data that is periodically reviewed, analyzed, and approved for peer group comparison



benchmarking

LABS FOR THE 21ST CENTURY

www.labs21benchmarking.lbl.gov

www.fabs21.lbl.gov



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Thank you!

Andrea Mercado
Senior Research Associate
Lawrence Berkeley National Laboratory
ACMercado@lbl.gov
510.486.5116



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BEST Center Curricula, Resources & Recordings

Academic Programs

Georgia Piedmont Technical College - Building Automation Systems

Milwaukee Area Technical College - Sustainable Facilities Operations

Laney College - Commercial HVAC Systems

City College San Francisco - Commercial Building Energy Analysis & Audits

Professional Development Materials, Presentations & Videos

National Institutes

Building Automation Systems Instructor Workshops

Webinars (e.g., BEST Talks)

Faculty Profile Videos

Reports & Case Studies

Marketing Resources

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