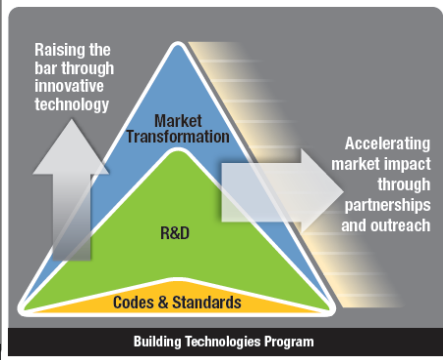
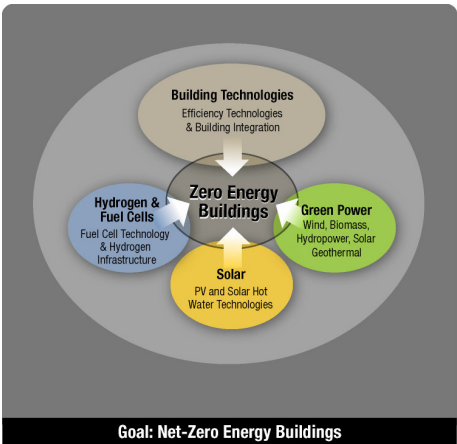


Market Analysis and Research Findings on Energy Efficiency Opportunities in National Chains

CEE
 January 17, 2007

Mary Colvin

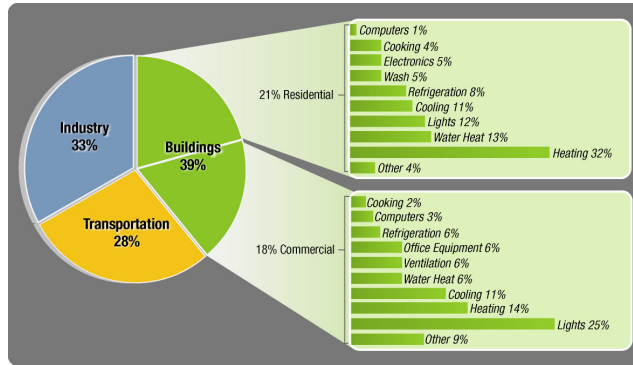
*National Renewable Energy Laboratory on behalf of
 DOE Building Technologies Program*





Buildings consume 39% of total U.S. energy

- 71% of electricity
- 53% of natural gas (primary consumption)



Source: 2005 Building Energy Databook with remainder equal to SEDS adjustment.



Report prepared for the DOE Office of Building
 Technologies Program by Innovologie, LLC.
 Issued March 2004

Focuses on the Structure and Operation of the Commercial Building Market to identify:

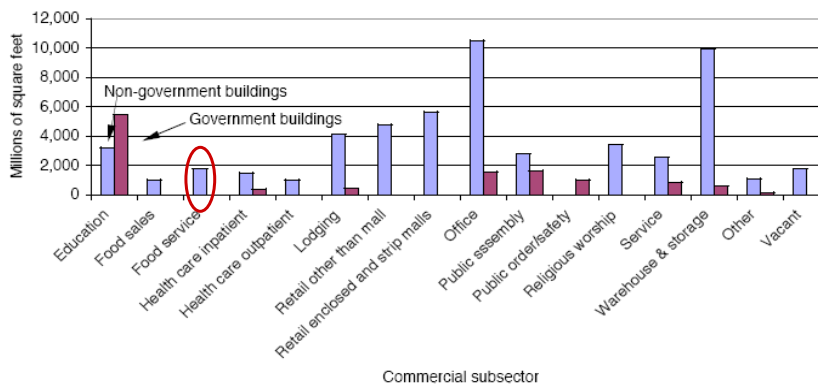
- Types and kinds of new construction in commercial area
- Number and size of players, including developers, owners, A&E firms
- Interactions between players
- Individuals who make decisions and influence trends
- Forces changing how buildings are being built
- Understanding differences among the various sub-markets



- 4.86 million Commercial buildings in the U.S. (based on 2003 data)
- Half of commercial buildings are less than 5,000 sqft.
- Approx. 70,000 new commercial buildings are added each year, primarily by:
 - Large-scale office
 - Malls
 - Chains or Franchises



Food Service is a small portion of the overall market.



Source: EIA, CBECS, 1999, Table B13



- 858,000 restaurants in the US totaling 1.85 billion sqft.
 - Total sales of more than \$400 billion
 - 25 firms account for ¼ of the sales and 1/8th of the buildings
- # of Restaurants has nearly doubled since 1972
- 46% of the nation’s food dollar goes to food service
- Food service industry employs 9% of the nation’s workforce
 - As an industry, it’s the largest private employer in the US
- More than half the eating and drinking establishments are franchise operations
- McDonald’s Corporation and Tricon Global Restaurant represent 28% of fast food sold.



Top 10 National Chains

Owner	Total Units	% Company Owns
1) McDonald’s	13,099	14%
2) Burger King	8,306	6%
3) Wendy’s	5,315	20%
4) Taco Bell	6,444	19%
5) Pizza Hut	7,719	22%
6) KFC	5,399	23%
7) Subway	13,101	0%
8) Domino’s Pizza	4,869	12%
9) Arby’s	3,198	0%
10) Dairy Queen	4,989	1%

Based on 2002 data. Source: QSR Online

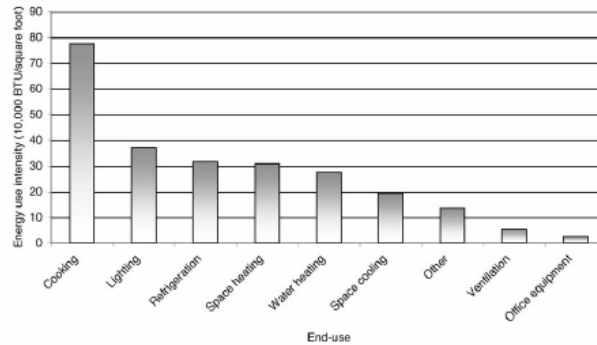


Trends

- **Americans are eating out more often**
- **Diet is changing**
 - New foods, new chains, new process loads
- **Take-out Sales have increased significantly**
 - At quick service restaurants, take-out accounts for 62% of total volume

Decision Priorities:

- First:** Health, Safety, and the Environment
- Second:** Return on Investment
- Third:** Merchandising / Operational Efficiency
- Last:** Reliability, Energy, and Other

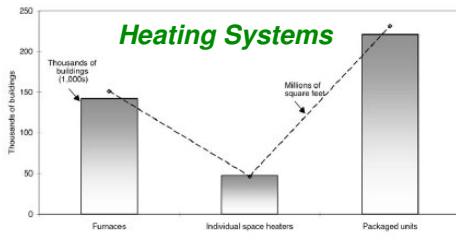


Source: EIA, CBECS 1995

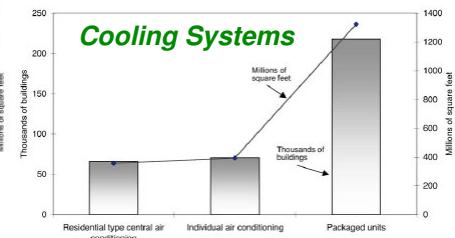
- **Cooking clearly the dominant load**
- **Space conditioning nearing 60,000 BTU/sqft**



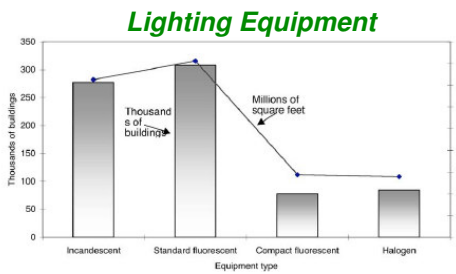
Equipment Choices



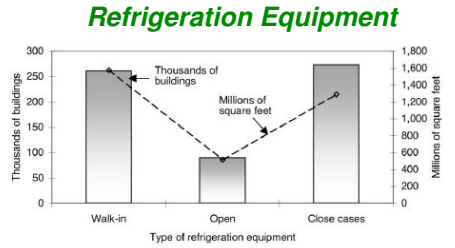
Source: EIA, CBECs 1999 Tables B32-B33



Source: EIA, CBECs 1999 Tables B34-B35



Source: EIA, CBECs 1999 Tables B39



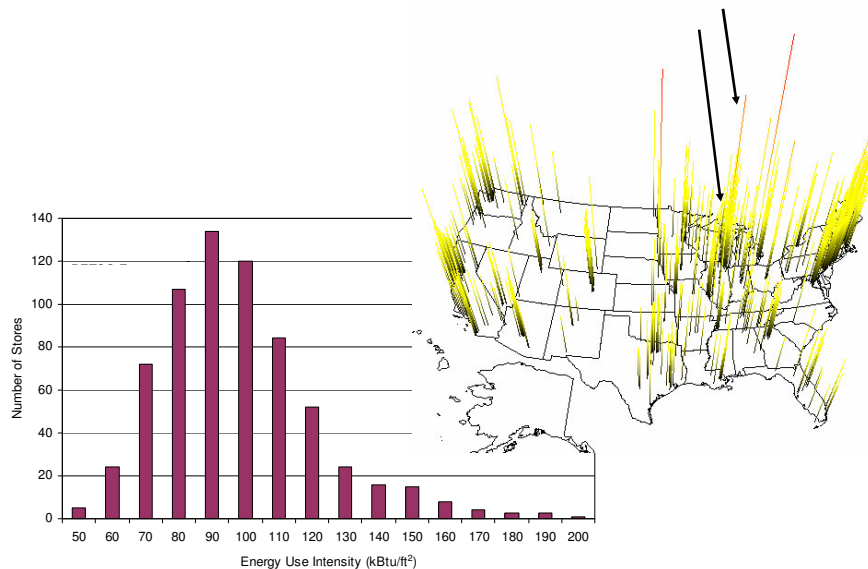
Source: EIA, CBECs 1999 Tables B36



Applied Efficiency Measures

Measure	Percent of total food service floor space
Electronic Ballasts	54%
Variable air volume systems	26%
Specular reflectors	20%
Energy management systems	12%

Source: EIA, CBECs public use sample, 1999 as analyzed by Innovologie, LLC. Floor space is the square footage for buildings having the measure. Not all of the space in a building may have the measure.



- Energy Management Systems only work if someone has the time and knowledge to operate it
- Error messages kill chains
- Data isn't managed
- Controls (for daylighting and dimmable ballasts) only save energy if their installed properly and operated correctly
- Chains use centralized standards and construction processes



- **Daylighting**
 - Under utilized to date
 - Preliminary evidence indicates sales may increase with more natural light
- **Cooking is the most intense energy use in these buildings.**
- **LED signage and refrigeration lighting**
- **Monitoring**
- **Systems Integration**



Market Perspective: Who Plays and Who Decides

Technical Perspective: Case Studies on Six High Performance Buildings
Lessons Learned from Case Studies

Advanced Energy Design Guide for Small Retail Buildings

<http://www.eere.energy.gov/buildings/>



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**
Bringing you a prosperous future where energy
is clean, abundant, reliable, and affordable

Thank you

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