



CBECs 2012: Update on EPA's Schedule and Methodology



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Agenda

- CBECS 2012 Survey
 - Overview
 - Energy Data
- EPA Analysis Plans
 - Timeline
 - Objectives
 - Opportunities for Input
- Source Energy
 - Methodology
 - Updates for Renewable Electricity
- Next Steps



CBECs 2012 Overview

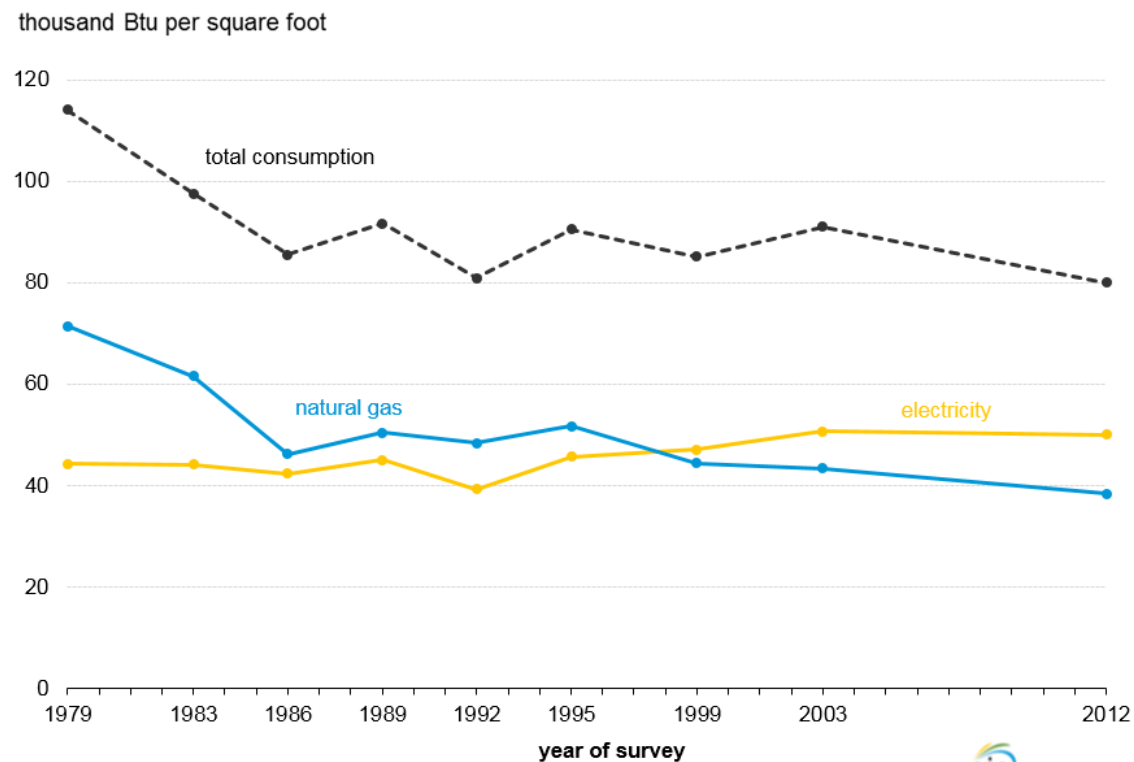
- **2012 survey sample size is over 6,700 observations**
 - 29% larger than 2003 survey
- **Estimate 5.6 million commercial buildings representing 87 billion ft²**
 - 14% increase in the number of buildings since 2003
 - 22% increase in floor space since 2003
- **EIA Data**
 - For updates and available microdata: <http://www.eia.gov/consumption/commercial/>
 - EIA has already published some energy comparisons for 2003 and 2012
- **EPA Analysis**
 - Some provisional energy data shared by EIA
 - Able to embark on preliminary analysis

Top Market Sectors	
1	Office 16.0 Billion ft ²
2	Warehouse 13.0 Billion ft ²
3	Education 12.2 Billion ft ²
4	Mercantile (Retail & Mall) 11.3 Billion ft ²
5	Lodging 5.8 Billion ft ²



Overall Trend in Energy Intensity

- Long term trend has been relatively stable over the last 30 years
- 2012 survey shows lower aggregate intensity as compared with 2003
- Unclear whether this trend will continue in the future



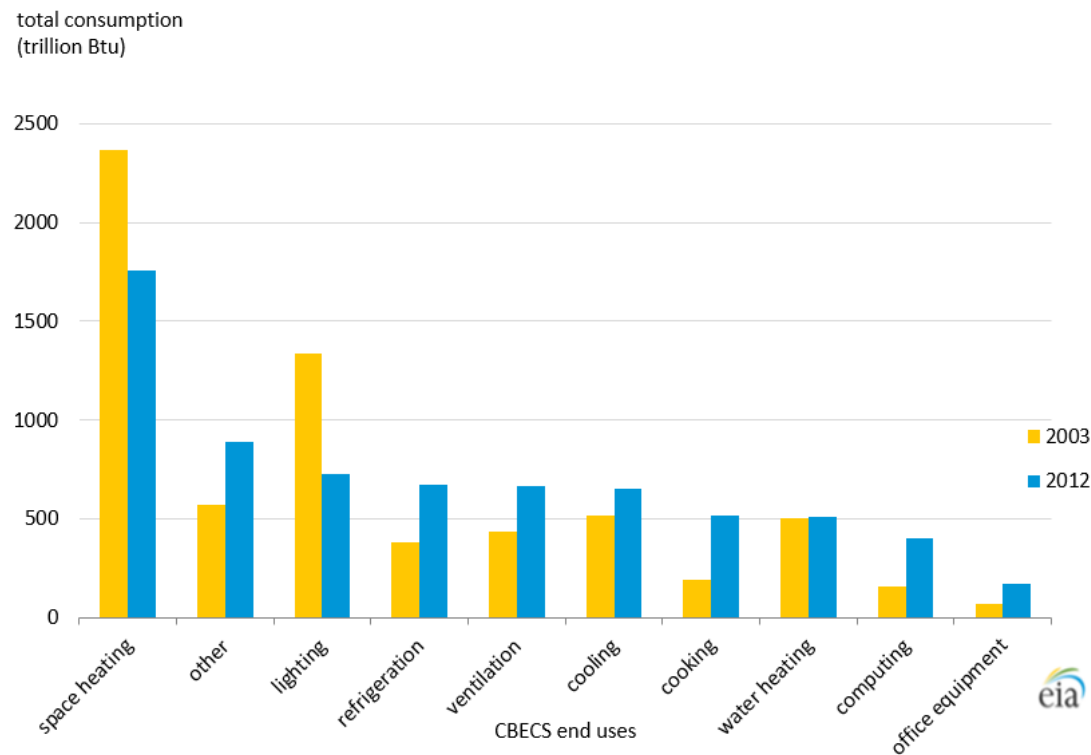
Source: U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey.





CBECS 2012: Energy Estimates by End Use

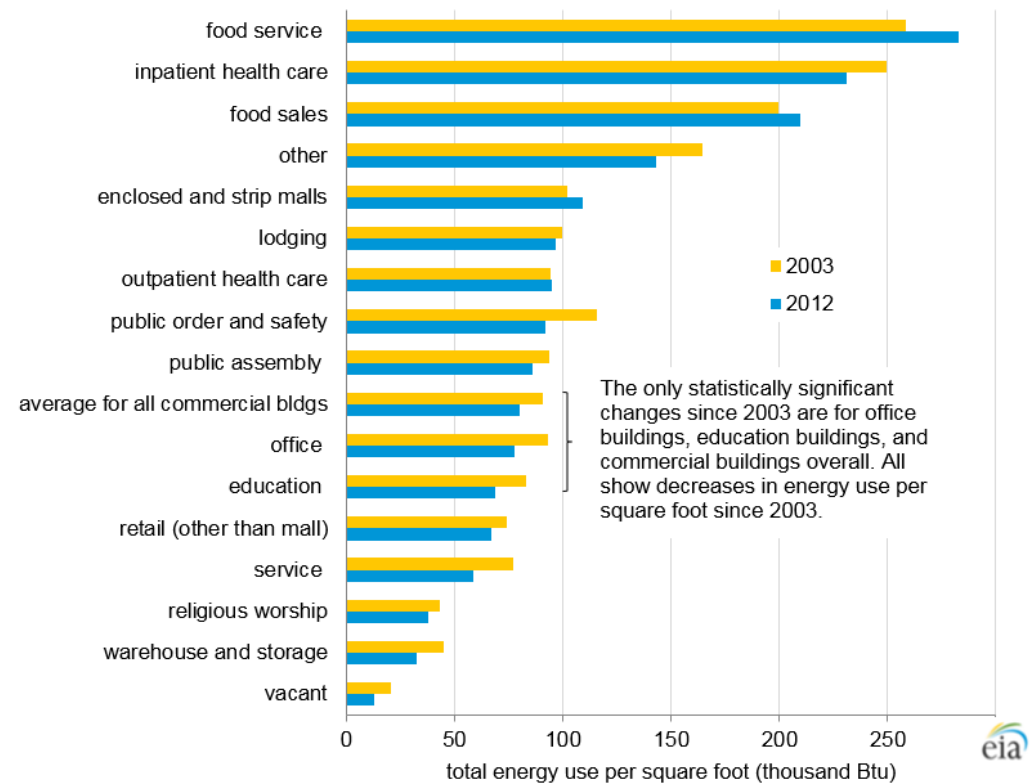
- Space heating remains the most dominant load
- CBECS 2012 data suggest improvements in space heating and lighting





CBECS 2012: Energy Use by Sector

- EIA has published a 2003 to 2012 comparison chart
- Only two sectors show statistically significant changes in energy use
 - Office
 - Education
- Note these are overall figures
 - Not normalized for changes in operation



Source: U.S. Energy Information Administration, Commercial Buildings Energy Consumption Survey.

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EPA's Analysis Plans



EPA Schedule for Score Revisions

- **Perform detailed analysis (~18 months)**
 - Hundreds of regression model formulations
 - Explore new variables captured by CBECS
 - Compare CBECS and Portfolio Manager Data
 - Determine appropriate changes to regression models used for score calculations
- **Program new scores into Portfolio Manager (~6 months)**
 - Document software requirements
 - Program code changes to the system
 - Perform extensive testing
- **Release new scores to the public**

→ ***Tentative target release in early 2018***



Early 2018? Really?

- **Yes**
- Considered 2 alternatives for model release:
 - Rolling – Release new scores as the analysis is complete, meaning that some scores would be updated in mid-late 2016
 - One Time – Release new scores for all property types together, in 2018
- Benefits of a One Time release
 - Scores for mixed use properties will only change once
 - A property with Office and Retail will not see changes at two different times
 - Scores across a portfolio of different property types will only change once
 - Economy of scale for combining regression analysis and software programming



Order of Analysis by Property Type

- Office & Retail
- Supermarket & Medical Office
 - Will be important to compare results with Retail and Office
- Hotel & K-12 School
- Warehouse & House of Worship

→ **Plan to focus on two models at a time** (for 3-4 months each)

→ **Once all models are completed will have some cross-model analysis and finalization**



Objectives of Analysis

- Leverage the most recent market data
 - This will show us if buildings are becoming more or less efficient
 - If the market is getting more efficient, then it may become harder to qualify for ENERGY STAR
- Re-assess key drivers of energy use
 - Have the relationships between existing variables (e.g. computers) and energy intensity changed in the last 10 years?
 - Are there new variables in CBECS that we should be adjusting for going forward?
- Perform cross-model analyses to gain a better understanding of the similarities and differences across different property types



What should you expect?

- **Expect some changes**
 - Median energy use for each property type
 - Correlations between energy use and key activities (hours, workers, computers)
 - Variables included in EPA's model
 - ***The scores of your properties!***
- **EPA's basic approach is not changing**
 - Provide a national level benchmark
 - Use source energy to provide equitable scores for all fuel mixes
 - Leverage ordinary least squares (OLS) regressions to assess factors that impact energy consumption
 - Incorporate variables that capture weather and business activity
 - Exclude from analysis terms about technology, in order to reward technology that saves energy



Will my baseline score change?

- *Yes, this is likely.*
- When we update the methodology the new calculation is applied to all time periods
- Therefore, you will still see changes from your baseline to current
 - Even if your scores go down, you will still see your improvement between the baseline and the current
- Allows comparisons between the current and baseline to reflect efficiency improvements
 - When comparing both periods, will only see the difference that is a result of your own activities, not EPA's methodology



Keep Calm and Continue Benchmarking

- **There is time**
 - Changes are not anticipated until 2018
- **We will keep you informed**
 - We will give ample notice of an exact date
- **We will not rescind prior certifications**
 - All of your certified properties will still be on our registry
 - If you have top performers that are not certified, now is a good time to pursue certification
- **We will coordinate with cities and other partners**
 - We will review the implications of changes
 - We will prepare organizations that use Portfolio Manager for implications of changes to the scores





Opportunities for Involvement

- **Main Webinar Series**
 - Updates approximately every 6 months until Portfolio Manager launch
 - Hear the latest findings
 - Participate in polls, ask questions & offer observations
 - Next session will be this fall
- **Sector-specific webinars**
 - Learn more detail about analytical results
 - Respond to polls to share your opinions and recommendations
 - Everyone with a property of the specific type will receive an invite and is welcome to participate
 - These are underway for **Office** and **Retail**
 - Listen to recordings from sessions the week of 4/25
 - Stay tuned for upcoming sessions in early June: <https://esbuildings.webex.com/>
- **Portfolio Manager Help Desk**
 - www.energystar.gov/BuildingsHelp
 - Every time you ask a question about your score, you contribute to our process!
 - You can always email us with suggestions or observations about our score and your portfolio



Kick-off Surveys – Open through tomorrow!

- Office:
 - https://www.surveymonkey.com/r/EnergyStar_OfficeScore
- Retail:
 - https://www.surveymonkey.com/r/EnergyStar_RetailScore
- Tell us what you really think!
 - What are important factors with respect to energy efficiency?
 - How do you think the market has changed in the last 10 years?
 - Is there anything in particular you want EPA to analyze?

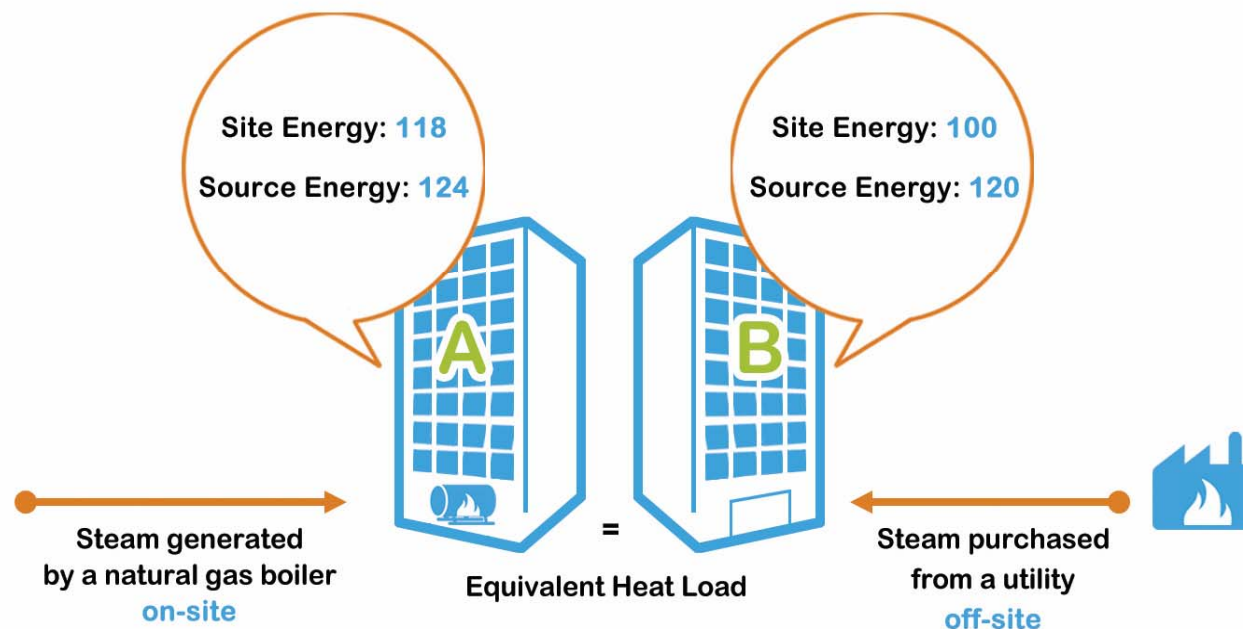
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Source Energy

EPA uses source energy to ensure that no individual building receives a credit (or penalty) based on the efficiency of its provider

Site Energy results in **Building B** appearing more efficient.
Source Energy provides an **equitable** comparison.





Source Energy Basics

- **Primary Energy**
 - Raw fuel such as oil or gas
 - When a building receives primary energy, it typically need to combust the raw fuel to transform it into something useful
 - The effect of this transformation/combustion is reflected in the site energy
 - Source calculation will account for line and distribution losses
- **Secondary Energy**
 - A product that has been created from a raw fuel
 - Most common examples are electricity and district steam
 - Can be used directly by the building once it is received
 - The site energy on its own does not show the effect of the transformation/combustion that occurred at the power plant
 - Source calculation will account for the combustion efficiency in addition to line/distribution losses

→ Source Energy places primary and secondary energy on an equal footing, by taking into account generation and transmission losses



Grid Electric Source Energy Factor

- Based on data published by the Energy Information Administration
 - Electric Flow Diagram
 - Monthly Energy Review
- Incorporates all types of electric generation
 - Coal
 - Gas
 - Oil
 - Hydroelectric power
 - Solar/Wind
 - Biomass
 - Etc.



Treatment of Renewable Electricity

- **Historical approach**

- EIA publications treat renewable energy as equivalent to fossil fuel energy
- Historic treatment was based on capacity planning exercises
- Impact of renewable energy was relatively small

- **New approach**

- Recognize that Solar, Wind, and Hydroelectric power are not subject to generation losses at the power plant, like fossil fuel (no combustion)
- When computing the national factor, account for these renewable sources with a 1:1 conversion ratio
- As the renewable portion of grid grows, this approach recognizes the efficiency gains at the national level



What does this change mean?

- **EPA will still use one national electric factor**
- **The electric factor will be lower**
 - This new lower factor will be incorporated into our CBECS regression analysis and National Median calculation
 - This new lower factor will be applied to your buildings in Portfolio Manager
 - During our webinars we will be sure to show “Adjusted” values from 2003 to facilitate comparisons between the surveys
- **Medians for 2012 will be lower**
 - Compared to the numbers you see in Portfolio Manager today, both your actual energy use and the national median will be lower
 - The use of the new factor alone will not change how you compare to median
- **Portfolio Manager will not change until 2018**
 - These changes will be implemented in 2018
 - All models will be re-estimated (including property types that do not use CBECS)
 - The changes to the factors affect both the underlying algorithm and the source energy calculation for your property



Summary

- EPA is embarking on our analysis of the CBECS 2012 data
- We anticipate releasing all updates to Portfolio Manager in early 2018
 - Single release date for all property types
- Score changes are likely
- You will have plenty of notice of the exact date before anything changes in Portfolio Manager
- You are invited to participate in regular webinars to offer your opinion



Next Steps

- Please take our kick-off surveys if you work with Office, Retail, or Supermarket properties
 - Office: https://www.surveymonkey.com/r/EnergyStar_OfficeScore
 - Retail: https://www.surveymonkey.com/r/EnergyStar_RetailScore
- Be on the lookout for our webinars specific to your sector
 - You should receive an email invite if you have a property of the given type
 - You can also reach out to us by email to ask to be included
 - All sessions will be posted publicly on our training calendar: <https://esbuildings.webex.com/>
- Expect another general status update this fall
- If you see something, say something
 - Feel free to reach out with suggestions or questions at any time: www.energystar.gov/BuildingsHelp
- EPA will be hard at work with regression analysis for the next 18 months 😊

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Questions & Discussion