



Updates to ENERGY STAR® Portfolio Manager Metrics

Leslie Cook

Matt Burgess

US EPA ENERGY STAR



Management Tool



Assess whole building energy and water consumption, plus waste



Track changes in energy, water, greenhouse gas emissions, and cost over time



Track green power purchase



Create custom reports



Share/report data with others



Apply for ENERGY STAR certification



ENERGY STAR® PortfolioManager®

Hundreds of metrics, including:



Energy use
Source, site,
weather
normalized,
demand



Water use
Water use
intensity,
Water Score
(for Multifamily)



**Waste &
Materials**
Waste intensity,
diversion rate



**1-100
ENERGY
STAR score**



**GHG
emissions**
Indirect,
direct, total,
avoided

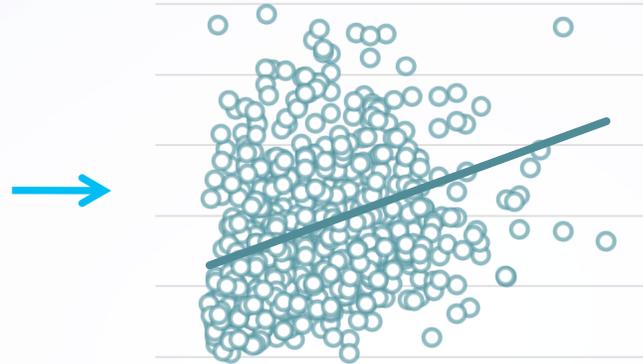


- **Hundreds of thousands of buildings benchmarking**
- **Two dozen local benchmarking policies**
- **One foreign government partnership (Canada)**

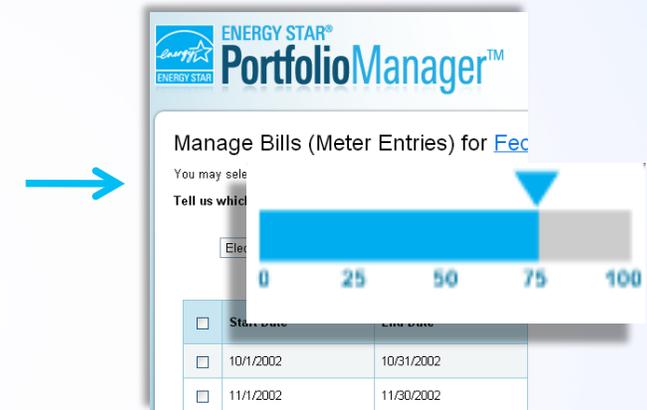
EPA's 1 – 100 ENERGY STAR scores are based on market data



Nationally representative survey
- CBECS gathers data on building characteristics and energy use from thousands of buildings across the U.S.



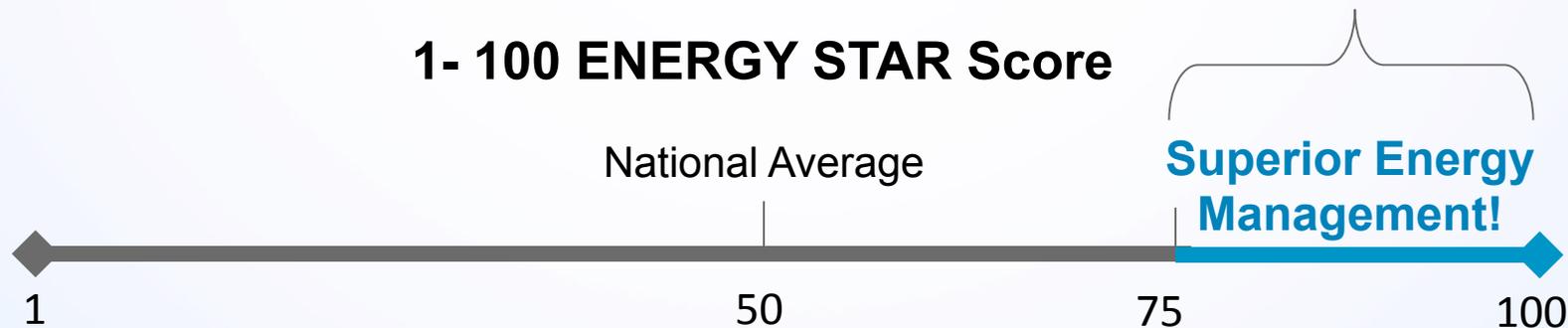
EPA creates a **statistical model** that correlates the energy data of the property use details to identify the key drivers of energy use, accounting for weather variations



Compares the actual energy data for a building to the modeled estimate to determine where the building ranks relative to its peers on a 1-100 scale

ENERGY STAR certification for commercial buildings

- Building must be in the United States, US territories, or Canada (Canadian certification launched March 2018!)
- Achieve an ENERGY STAR score of 75 or higher
- Apply for ENERGY STAR recognition via Portfolio Manager
- Application must be verified by a licensed professional
- Awarded based on the calendar year of application



Property types with 1-100 ENERGY STAR scores

| | | | | | | |
|-------------------------------------|---|--|---|---|---|---|
| Score based on CBECS data |  |  |  |  |  |  |
| | Bank Branch | Barracks* | Financial Offices | K-12 Schools | Supermarkets | Wholesale club/ Supercenters |
| |  |  |  |  |  |  |
| | Medical Offices* | Hotels | Residence Hall/ Dormitory* | Office Buildings | Courthouses | Worship Facilities |
| |  |  |  | | | |
| | Retail Stores | Distribution Centers | Warehouses | | | |
| Score based on other survey data |  |  |  |  |  | |
| | Data Centers | Hospitals | Senior Care Communities | Wastewater Treatment Plants* | Multifamily Housing | |

*These building types are not eligible for ENERGY STAR certification.

What's getting updated?

- 1-100 ENERGY STAR score models for US buildings (based on CBECS 2012)
 - **Offices**
 - Financial offices
 - Bank branches
 - Courthouses
 - **K-12 Schools**
 - **Retail**
 - Retail store
 - Warehouse club/ supercenter
- National source energy factor
- Data center benchmarking options
- **Supermarkets**
- **Hotels**
- **Warehouses**
 - Refrigerated
 - Non-refrigerated
 - Distribution centers
- **Houses of Worship**

Updates to design metrics

- ENERGY STAR Portfolio Manager and Target Finder generate metrics used to evaluate *energy design targets of new construction*, including the 1-100 score.
- Both tools calculate metrics using the same underlying methodology, so design metrics are also getting a refresh.

ENERGY STAR®
PortfolioManager®

ENERGY STAR®
TargetFinder™

Future updates to note

- Currently conducting national surveys of US hospitals and medical office buildings
- Efforts supported by industry partners
- Based on the results, we hope to update ENERGY STAR scores for hospitals and medical office buildings, *likely in 2019*
- If survey data is sufficient, we hope to reinstate ENERGY STAR certification for medical office buildings



Why are we updating metrics?

- EPA is committed to providing information about building performance based on the most up-to-date market data available.
- When updated data sources become available, we refresh our ENERGY STAR metrics accordingly
- EPA's basic approach is **not** changing
 - Provide a national level benchmark
 - Use source energy to provide equitable scores for all fuel mixes
 - Incorporate variables that capture weather and business activity
 - Exclude from analysis terms about technology, in order to reward technology that saves energy

Schedule for metric updates

- **Perform detailed analysis**
 - Started May 2016
 - 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 metric updates into Portfolio Manager**
 - Ongoing
 - Document software requirements
 - Program code changes to the tool and perform extensive testing
- **Release updated metrics in Portfolio Manager**

→ Target date is August 26, 2018

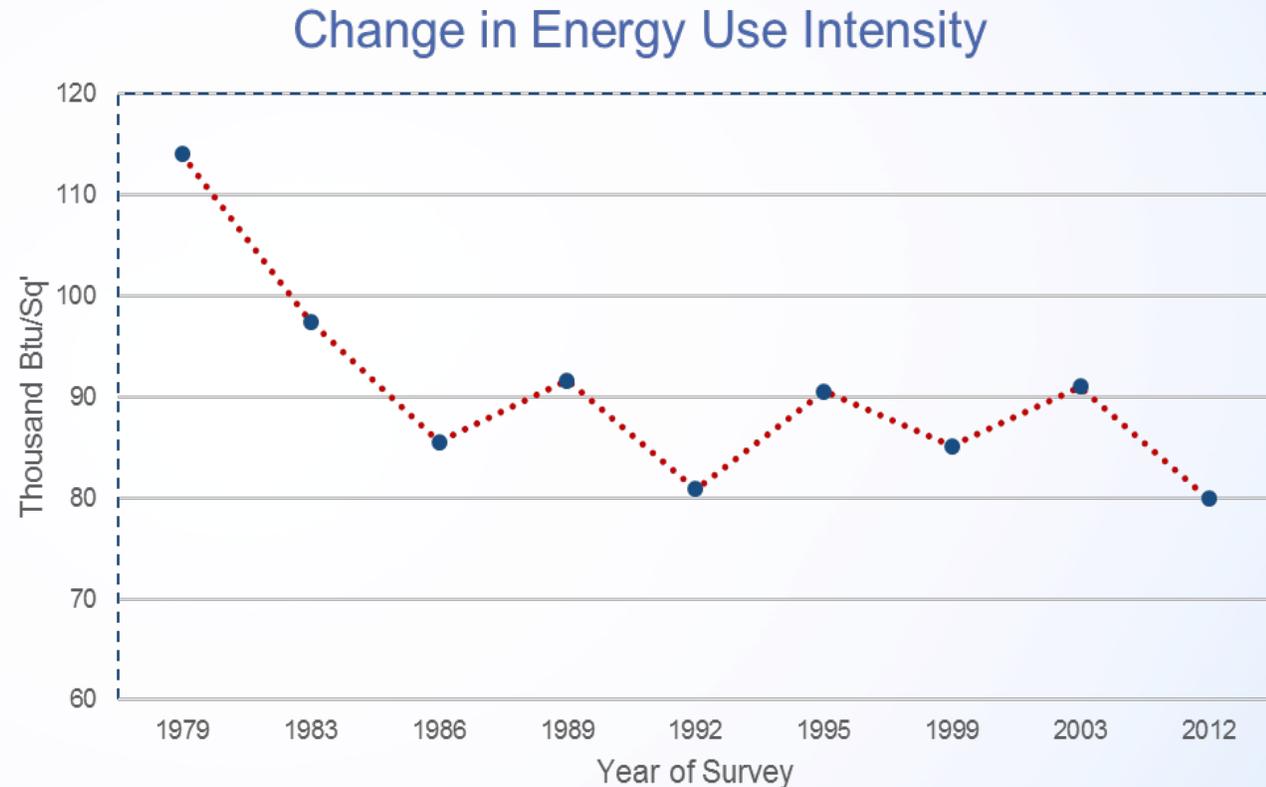
Impact on historical scores

- When we update the methodology, the new calculations will be applied to all time periods
- Users will maintain the ability to compare performance over time
 - Even if scores go down, users will still see their improvement between the baseline and the current periods
 - Continue to analyze differences that are a result of their own activities, not EPA's methodology

| Metrics Summary | | | |
|--|----------------------------|---------------------------|--------------------|
| Metric | Dec 2014 (Energy Baseline) | Mar 2017 (Energy Current) | Change |
| ENERGY STAR Score (1-100) | 39 | 48 | 9.00 (23.10%) |
| Source EUI (kBtu/ft ²) | 294.9 | 264.4 | -30.50 (-10.30%) |
| Site EUI (kBtu/ft ²) | 118.7 | 95.8 | -22.90 (-19.30%) |
| Energy Cost (\$) | 581,581.78 | 540,588.06 | -40993.72 (-7.00%) |
| Total GHG Emissions Intensity (kgCO ₂ e/ft ²) | 11.3 | 9.9 | -1.40 (-12.40%) |
| Water Use (All Water Sources) (kgal) | 3,373.9 | 3,228.1 | -145.80 (-4.30%) |
| Total Waste (Disposed and Diverted) (Tons) | 879.99 | 836.75 | -43.24 (-4.90%) |

Overall trend in U.S. building energy use

- Long-term trend has been relatively stable over the last 30 years.
- 2012 survey shows lower aggregate intensity as compared with 2003.
- This is a good trend. It also means that ENERGY STAR scores will shift.



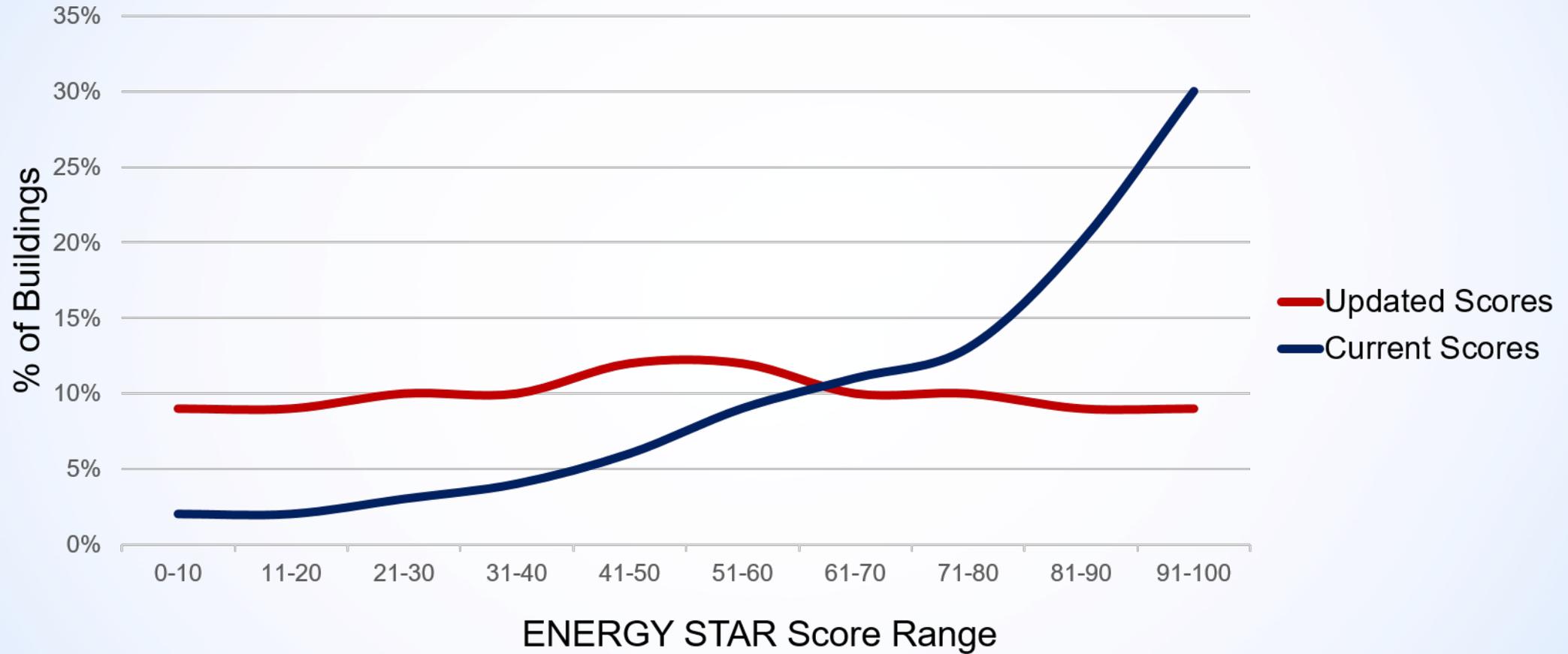
2012 Commercial Buildings Energy Consumption Survey

- **New and improved data**
- Nationally representative survey of U.S. commercial buildings
- Collects energy usage data and building characteristics
- Published in 2016 by the DOE's Energy Information Administration (EIA)
 - More current data than 2003 CBECS used for current score
- Larger sample
 - 29% larger than 2003 (6,720 vs. 5,215 records)
- More buildings and bigger buildings in the U.S.
 - 14% increase in the total number of buildings
 - 22% increase in total building floor space

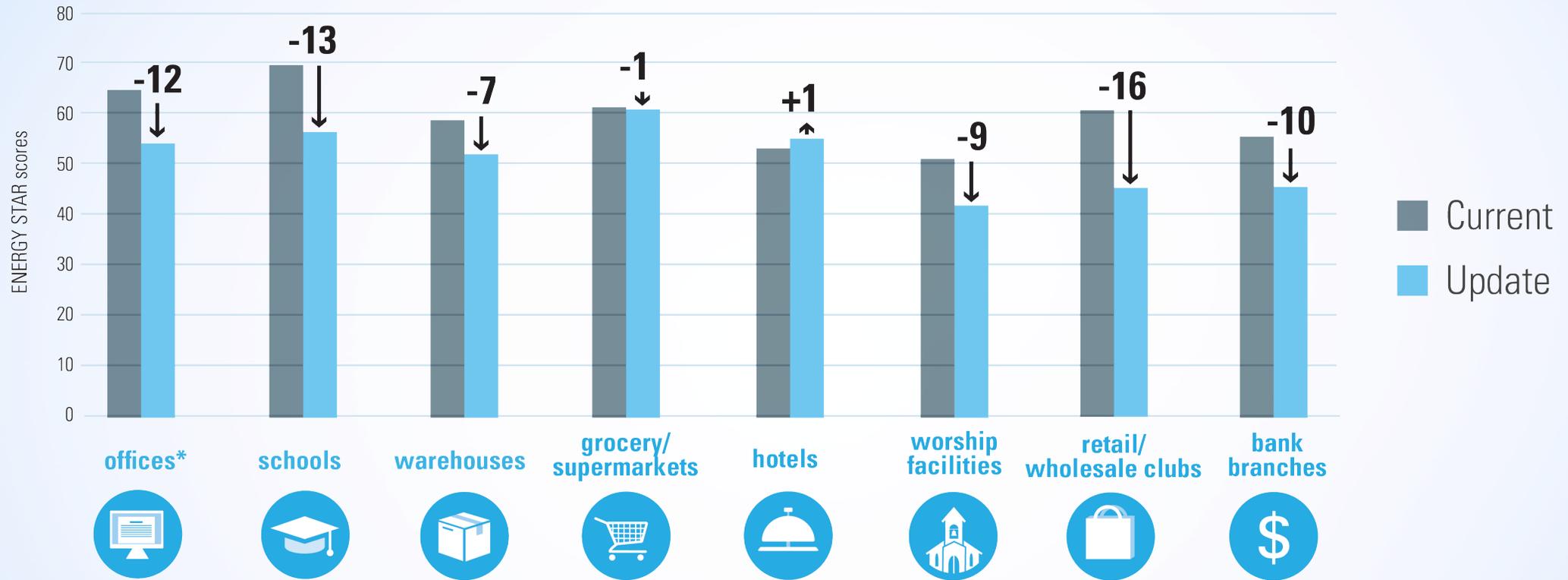
Objectives of analysis and score update

- 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 operating characteristics and energy intensity changed in the last 10 years?
 - Are there new variables in CBECS that we should be adjusting for going forward?

ENERGY STAR scores need to be recalibrated over time



Working estimated average ENERGY STAR score change by space type



*office, financial office, courthouse

These are average score changes for these building types. An individual building's score change is likely to differ from the average change shown above.

New buildings size minimum requirements for ENERGY STAR Score

| Property Type | Current Score Minimum | Updated Score Minimum |
|-----------------------|-----------------------|-----------------------|
| Bank Branches | 1,000 ft ² | 1,000 ft ² |
| Worship Facilities | 1,000 ft ² | 1,000 ft ² |
| Offices | 5,000 ft ² | 1,000 ft ² |
| Schools | 5,000 ft ² | 1,000 ft ² |
| Warehouses | 5,000 ft ² | 1,000 ft ² |
| Grocery/Supermarkets | 5,000 ft ² | 5,000 ft ² |
| Hotels | 5,000 ft ² | 5,000 ft ² |
| Retail/Wholesale Club | 5,000 ft ² | 5,000 ft ² |

New use details in Portfolio Manager

- Warehouse
 - Percentage of Gross Floor Area Used for Cold Storage (**New in August**)
 - Percent that can be cooled and Percent that can be heated (**New in August for Refrigerated Warehouse**)
- Worship Facilities
 - Gross Floor Area Used for Food Preparation (**New in August**)
 - Percent that can be cooled and Percent that can be heated (**New in August**)
- K-12 Schools
 - Number of Workers on Main Shift
 - Exists now, but **will be required in August**
- Supermarket
 - Number of Open or Closed Refrigeration/Freezer Units
 - Exists now, but **will be required in August**

A summary of Use Detail updates are included in this [FAQ](#).

Data center energy estimates

Two options for properties with data centers

1. Existing and recommended option

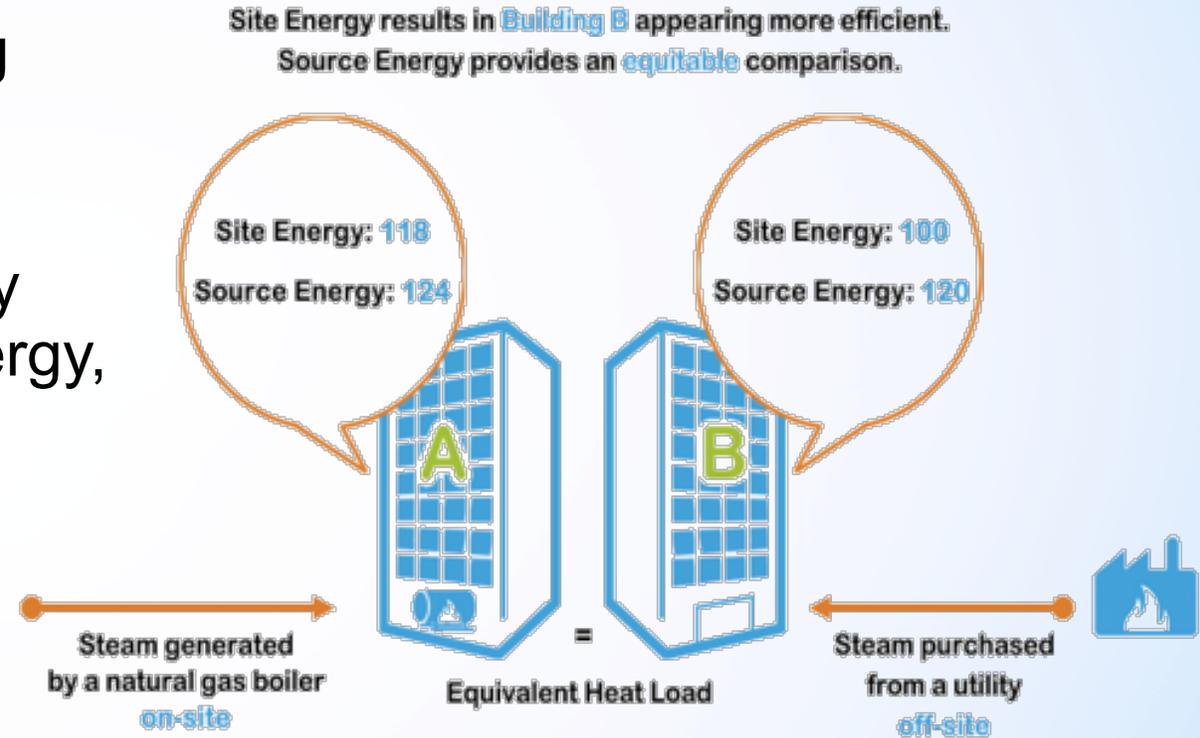
- Measure and enter IT energy
- Industry best practice – Most accurate and complete measure

2. New option: Estimated energy use for data centers

- Coming in August 2018
- Designed for smaller data centers, within another property type, and where it is not practical to measure IT Energy
- Estimate capped at 10% of the building area

Update to source energy factor

- Source energy traces the heat and electricity requirements of the building back to the raw fuel input
 - Level playing field for different fuel types
- Portfolio Manager delivers several key performance indicators in Source Energy,
 - Weather normalized source EUI.
 - ENERGY STAR score
- Incorporates all types of electric generation: Coal, Gas, Wind, Hydro, etc...



Electric Source Factor: grid electricity from renewable energy

- **Past approach**

- Grid electricity generated from renewable energy treated as requiring the same raw fuel inputs as fossil fuel energy.

- **New approach**

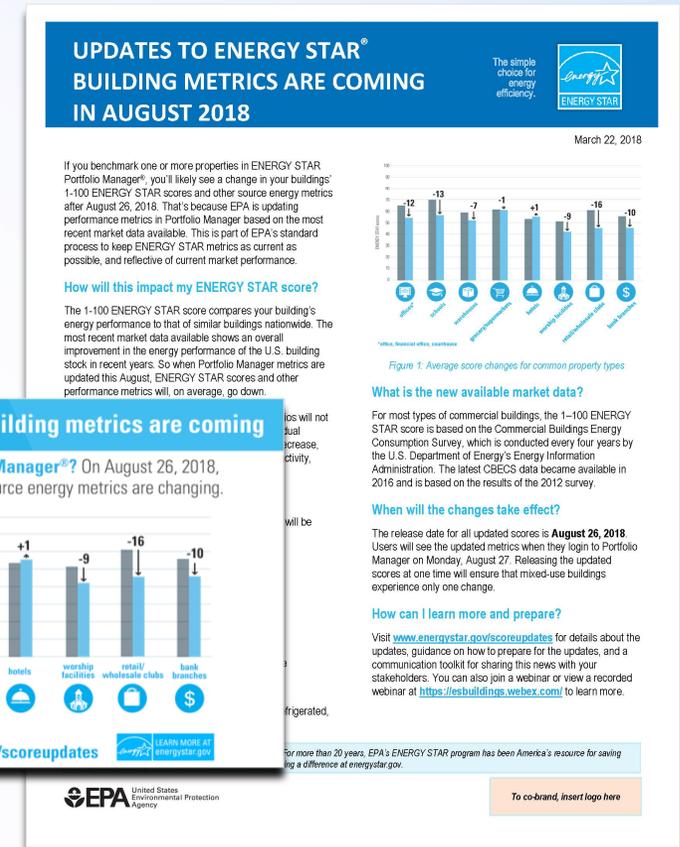
- Offsite renewables lower the national average electric source factor. Electricity generated from renewable energy sources have lower raw fuel inputs than electricity generated from fossil fuels.

- **New electric source factor releasing Aug 2018**

- Dropping from 3.1 to 2.8 (more efficient grid)
- Will impact ENERGY STAR score & all source energy metrics
- ENERGY STAR score could increase or decrease depending on a building's fuel-mix ratio
- Changes based on this update alone will be small in magnitude comparatively

Preparing for the updates

- Communicate metric updates to colleagues, clients, stakeholders, etc. using EPA's communications toolkit:
 - ✓ Co-brandable fact sheet
 - ✓ Shareable graphic
 - ✓ Template social media content
 - ✓ Template training slides
 - ✓ Quick video tutorial about the 1-100 ENERGY STAR score



UPDATES TO ENERGY STAR® BUILDING METRICS ARE COMING IN AUGUST 2018

March 22, 2018

If you benchmark one or more properties in ENERGY STAR Portfolio Manager®, you'll likely see a change in your buildings' 1-100 ENERGY STAR scores and other source energy metrics after August 26, 2018. That's because EPA is updating performance metrics in Portfolio Manager based on the most recent market data available. This is part of EPA's standard process to keep ENERGY STAR metrics as current as possible, and reflective of current market performance.

How will this impact my ENERGY STAR score?

The 1-100 ENERGY STAR score compares your building's energy performance to that of similar buildings nationwide. The most recent market data available shows an overall improvement in the energy performance of the U.S. building stock in recent years. So when Portfolio Manager metrics are updated this August, ENERGY STAR scores and other performance metrics will, on average, go down.

Figure 1: Average score changes for common property types

| Property Type | Average Score Change |
|------------------------|----------------------|
| Offices | -12 |
| Schools | -13 |
| Warehouses | -7 |
| Grocery/Supermarkets | -1 |
| Hotels | +1 |
| Warehouse/Facilities | -9 |
| Retail/Wholesale Clubs | -16 |
| Bank Branches | -10 |

What is the new available market data?

For most types of commercial buildings, the 1-100 ENERGY STAR score is based on the Commercial Buildings Energy Consumption Survey, which is conducted every four years by the U.S. Department of Energy's Energy Information Administration. The latest CBECs data became available in 2016 and is based on the results of the 2012 survey.

When will the changes take effect?

The release date for all updated scores is **August 26, 2018**. Users will see the updated metrics when they login to Portfolio Manager on Monday, August 27. Releasing the updated scores at one time will ensure that mixed-use buildings experience only one change.

How can I learn more and prepare?

Visit www.energystar.gov/scoreupdates for details about the updates, guidance on how to prepare for the updates, and a communication toolkit for sharing this news with your stakeholders. You can also join a webinar or view a recorded webinar at <https://esbuildings.webex.com/> to learn more.

www.energystar.gov/scoreupdates

EPA United States Environmental Protection Agency

To co-brand, insert logo here

Download EPA's score update materials at: www.energystar.gov/scoreupdates

Preparing for the updates

- Get ready for the upcoming data center flexibility and new required inputs for the ENERGY STAR score
- If needed, document pre-update metrics with Portfolio Manager reports (in Reporting Tab)
 - **“Performance Highlight” Report** (Portfolio level, multi-year)
 - **Statement of Energy Performance** (Building level, represents 12 month performance period)
 - Metrics can also be extracted with **Portfolio Manager web services** if you are a provider or work with a provider.

ENERGY STAR Statement of Energy Performance

77
ENERGY STAR® Score¹

Sample Property
Primary Property Function: Office
Gross Floor Area (ft²): 50,419
Built: 1951
For Year Ending: July 31, 2014
Date Generated: October 01, 2014

1. The ENERGY STAR score is a 1-100 assessment of a building's energy efficiency as compared with similar buildings nationwide, adjusting for climate and business activity.

Property & Contact Information

| Property Address | Property Owner | Primary Contact |
|---|---|--|
| Sample Property 123 Main St Boston, Massachusetts 02134 | Property Inc. 123 Early Bird St. Washington, DC 20460 202-999-9876 | Jane Doe 123 Early Bird St. Washington, DC 20460 555-123-4567 jane_doe@propertyinc.com |

Property ID: 3681885

Energy Consumption and Energy Use Intensity (EUI)

| Site EUI | Annual Energy by Fuel | National Median Comparison |
|---|--|--|
| 75.7 kBtu/ft ² | Electric - Grid (kBtu) 2,453,824 (84%) | National Median Site EUI (kBtu/ft ²) 103.5 |
| | Natural Gas (kBtu) 1,273,766 (33%) | National Median Source EUI (kBtu/ft ²) 247.6 |
| | Propane (kBtu) 91,000 (2%) | % Diff from National Median Source EUI -27% |
| Source EUI 181.2 kBtu/ft ² | | Annual Emissions Greenhouse Gas Emissions (Metric Tons CO ₂ e/year) 311 |

Signature & Stamp of Verifying Professional

I _____ (Name) verify that the above information is true and correct to the best of my knowledge.

Signature: _____ Date: _____

Licensed Professional

John Smith
4 Privet Dr
Arlington, VA 22201
703-111-1234
john_smith@energyinspectors.com

Professional Engineer Stamp
(if applicable)

Preparing for the updates

- Apply for ENERGY STAR certification...especially if your score is close to 75!
- Applications submitted by July 26, 2018 will be assessed using currently available (pre-update) scores.
 - **Applications received before July 26, 2018** and which require no significant follow-up or changes, will be guaranteed to be approved and awarded certification prior to the score changes.
 - **Applications received July 26 – August 26** are not guaranteed to be approved prior to the score changes.
 - **Applications received after August 26** will be evaluated using the updated score models.
- EPA will not rescind prior ENERGY STAR certifications.



New application eligibility flexibility for buildings that earned the ENERGY STAR in 2017

- To aid in this transition to updated scores, EPA is making a one-time update to eligibility rules to allow everyone to apply before the score changes are implemented.
- EPA is updating the requirement to wait at least 11 months after the “Year Ending” date of your last approved application.
- **Policy for 2018 Only** – All buildings that earned 2017 ENERGY STAR certification will be eligible to apply for 2018 certification using a “**Year Ending Date**” of **April 30, 2018** or earlier.
- **If you earned 2017 certification, eligible buildings (>75) can apply now.**

Tip for applying early: Check for site visit re-use eligibility

- One site visit can be performed for two consecutive application years, as long as requirements for both certification years are met (i.e., the site visit occurs within the last month of application period or within the 120 days after the first certification year, **and** within the 12-month application period for the second certification).
- For 2018 certification: April 30 is the eligible ending date for all properties that certified in 2017, regardless of Period Ending Date (PED) – this means **there's a high likelihood your 2017 site visit date can be re-used**.
- Example: If 2017 PED was 9/30/17 and site visit occurred anytime between 5/1/17 and 1/31/18, it's eligible for re-use if 4/30/2018 is used as the 2018 application year ending date
- The Licensed Professional is **still responsible** for verifying that nothing has changed in terms of the operations, confirming that data entered into Portfolio Manager is accurate, and verifying energy bills.

General tips to speed application review while maintaining quality

- Review the application PDF for completeness
- Ask the property manager in advance for a fast turnaround time on signing the application
- Make sure vacant Office space is properly benchmarked (0 weekly operating hours, 0 workers, 0 computers).
- If you receive an eligibility alert during the application process, be sure that you
 - (a) check to make sure the data that raised the alert is accurate, and
 - (b) provide a complete and thorough response, ensuring all parts of the question in the alert are answered.

How EPA is preparing

- Conducting general outreach and sector-specific webinars, ongoing since 2014
- Coordinating with local and state benchmarking policy implementers
- Briefing organizations that offer incentives, recognition, and third party certifications based on ENERGY STAR metrics
- Released a communications toolkit so we can broadly share consistent information leading up to August 2018

Learn more at www.energystar.gov/scoreupdates

- Summary of changes
- Timeline of 2018 metric updates
- Guidance on how to prepare
- Metric update Communications Toolkit
- Links to FAQs
- Slides from previous webinars
 - Embedded video of recorded first webinar
 - Links to six recorded sector-specific update webinars

Questions and Discussion

Learn more at www.energystar.gov/scoreupdates