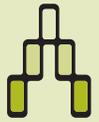# COMMON ROADBLOCKS TO EARNING THE ENERGY STAR

BETTERBRICKS
Bottom line thinking on energy.

SUMMARY

The ENERGY STAR label is a valuable indicator of high performance in commercial buildings. Achieving it requires dedication to energy efficiency as well as an understanding of the benchmarking and certification process. Prior to engaging a professional engineer to certify the property on behalf of ENERGY STAR, take the time to identify and correct potential data problems or building operation issues that may stand in the way. For example, understand the restrictions on space data inputs, get accurate occupancy figures, ensure all energy meters are represented in Portfolio Manager, and be familiar with standards for ventilation, lighting and comfort that the building must meet in order to qualify.

IN DEPTH

For many real estate professionals, achieving the ENERGY STAR label is a substantial accomplishment, acting as a tangible sign of smart energy management and excellence in building operations. It is an outward indicator of building quality, demonstrating to tenants, building owners, and the community at large that this particular property and its management team are achieving significant efficiencies in energy performance.

With the growing emphasis on sustainable practices and energy efficiency, more building teams are seeking ENERGY STAR labels. When applying for the first time, many property management teams are surprised at how data issues, logistics, and technical requirements can hinder the process. To streamline certification, first understand the eligibility requirements and correct potential problems.

VALIDATION BY A PROFESSIONAL ENGINEER

Benchmarking the building and earning the minimum energy performance rating of 75 is only the first step toward obtaining the ENERGY STAR label. To ensure the quality of the label, an objective assessment of the building's energy performance must be performed by a licensed professional engineer (PE). Additionally, the certifying PE must be acting within their field of expertise. As a critical third-party validation of the accuracy of the Portfolio Manager data, the PE ensures that the space data is correct and complete, that all energy meters have been included, and that the rating as a whole is based on reliable data.
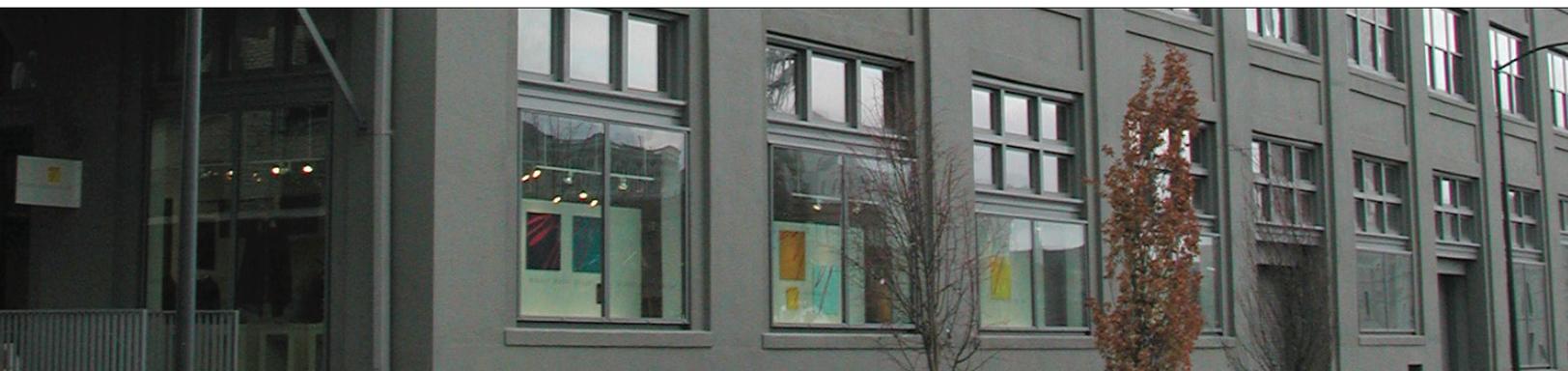
The PE is serving as a representative of ENERGY STAR. After inspection of the property and confirmation of the data, the PE will review the Statement of Energy Performance and Data Checklist (downloaded from Portfolio Manager). With the PE's stamp and signature, this becomes an official document, and is submitted to EPA for final approval. Because the PE's stamp carries with it a legal liability and stringent state licensing requirements, this process reinforces the consistency of the ENERGY STAR program.

ELIGIBILITY REQUIREMENTS

ENERGY STAR has a number of parameters that all buildings must fall within in order to maintain a meaningful, comparable energy performance rating. During the benchmarking process, check to ensure that none of the following conditions will prevent your property from earning a rating and becoming eligible for the label.

More than 50% of the building's gross floor area (excluding parking areas) must be defined by one of the space types eligible to receive an energy performance rating[1], such as "Office" or "Hotel." This determines the category of buildings – out of all buildings in the national stock – to which the property is being compared. Within that space, there is no need to break out lots of different types of space, such as individual office suites. Rather, the idea is to describe the main function of the building in as few space entries as possible.

Once you have selected the main space type, there may be a few other types of space within the building that need to be separately represented in Portfolio Manager (e.g., computer data centers). However, there are restrictions on the size of some of those spaces: office buildings with more than 10% "Computer Data Center," "Multifamily Housing," or "Other" space are not eligible to receive a rating.

You cannot artificially reduce this space in Portfolio Manager in order to get a rating. However, if this space is separate from the main building in terms of its utility bills and energy-consuming systems (i.e., has dedicated HVAC), or if it is sub-metered, it may be able to be removed from the Portfolio Manager data, allowing the remainder of the building to receive a rating. This is the exception rather than the rule, and requires follow-up with ENERGY STAR's technical support group (buildings@energystar.gov) to

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[1] For more information about the types of buildings that are eligible to earn energy performance ratings, visit www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_eligibility.

confirm the process prior to completing the benchmarking. The exception most commonly applies to spaces such as restaurants, which must be benchmarked as "Other" because Portfolio Manager does not offer a rating for restaurants.

If retail stores are part of an office building, there are different ways to treat them depending on a few characteristics. If an individual store is greater than 5,000 square feet and has an exterior entrance to the public, enter it as a separate space. Otherwise, aggregate the stores together and input them along with the general "Office" square footage. If more than 50% of a mixed-use property is comprised of retail stores, it is not eligible to receive a rating. Refer to ENERGY STAR's mixed-use guidance: www.energystar.gov/index.cfm?c=eligibility.bus_portfoliomanager_eligibility_mixed.

If more than 50% of gross floor area is a parking structure (which is to say, if the parking structure is larger than the building itself), the property cannot receive a rating. (Note that this caveat does not apply to uncovered parking or surface parking square footage.) The energy consumption from the parking structure must be sub-metered so that both its energy usage and square footage can be removed from Portfolio Manager. This is the only EPA-approved approach; arbitrarily reducing the square footage to stay below the threshold is not acceptable. Once sub-metered energy usage of the parking structure is available, use Portfolio Manager's "Update"[2] feature to reduce the parking square footage to zero, starting on the same date that parking energy use is first removed from the monthly meter entries.

MEASURING SQUARE FOOTAGE

There are many different interpretations of interior space in a building. Real estate professionals often think in terms of leasable area, excluding common areas that aren't factored directly into a tenant's rent. Architects and designers tend to focus on the entire building footprint from the outside edge of the envelope. Confusion arises when different parties are not using the same language and measurements.

Because the ENERGY STAR rating is an indicator of an entire building's energy performance, all interior space must be included in Portfolio Manager. Use either the BOMA gross square footage numbers or those on the original architectural plans showing the permitted gross square footage.

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[2] For guidance on the difference between "corrections" and "updates" in Portfolio Manager, view the ENERGY STAR recorded training on the topic. Go to https://energystar.webex.com and click Recorded Sessions, then select *Correct and Update Space Attributes in Portfolio Manager.*

When inputting the square footage that falls into Portfolio Manager's "Office" space type, make sure all supplemental areas are included. These include mechanical and electrical closets, penthouses, elevator machine rooms, hallways, lobbies, employee kitchens and conference rooms, etc.

The "Computer Data Center" space type is typically defined as rooms with dedicated 24-hour mechanical cooling, housing high-volume data processing equipment. Telecommunications closets and copy/print rooms are not considered data centers, even if they have separate exhaust fans – these areas are included in the "Office" space model along with the other supporting areas described above.

Parking area square footage need only be input in Portfolio Manager if parking lighting or ventilation systems are included in the energy consumption read by the main building energy meter(s). When defining parking lot square footage, be sure to include only the spaces and lanes that cars actually drive on, excluding any surrounding landscaping that is lit by the parking lot's lighting.

OCCUPANCY AND COMPUTER COUNT

A building's occupancy and plug load naturally affect energy consumption, so they need to be properly accounted for in Portfolio Manager. The PE will use professional judgment to assess the accuracy of the numbers provided for "Workers on Main Shift" and "Number of PCs" (which is used as a proxy for the total plug load in the office building).

To determine the number of workers, use building ID cards; if possible, ask tenants to submit actual head counts. Accurate counts are always preferable, but if you need to estimate the number of workers, typical averages are one worker per 250 square feet of gross building area (varying depending on the type of tenant and the market the building is in, among other factors). Verify that the number being used is actually the number of workers present in the space on the main shift, excluding workers from other shifts, customers, or other transient visitors to the building.

When estimating the number of computers, ENERGY STAR suggests using a ratio of 1.2 PCs per person. If the building's tenants include a software, brokerage, or accounting company, it is better to get an actual count of computers. Do not include the servers or computers housed in any space designated as "Computer Data Center," as they are already included in the plug load allocated to the data center. Also, do not include printers, fax machines, or other office equipment.

If a building averaged at least 50% unoccupied over the past 12 months – whether this space is vacant, or leased but physically unoccupied – it is not eligible for a label. Buildings that are greater than 50% occupied are eligible for a label, provided that their vacant square footage is input as a separate space (still using the "Office" space type, since there is no designated space type for vacant space in Portfolio Manager) with zero weekly operating hours, workers, and PCs. Changes in occupancy over time are represented by updating the worker and PC counts in the occupied "Office"

space type, and transferring square footage between the vacant and occupied spaces (again using the "Update" feature). Make sure that you are offsetting a reduction in square footage in one space type with an increase in the other by the exact same amount. These changes should only be made if the occupancy increases or decreases by 10% or more; smaller changes may be aggregated over time and input as a single update.

HOURS OF OPERATION

The operating hours of any space – an office, a store, a parking garage – directly impact how much energy it uses. For example, if two floors of a building have to operate 24/7 for a call center tenant, the building would typically use more energy than an otherwise identical building with occupancy of 50 hours a week.

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"Weekly Operating Hours," is not equal to the run-times of the HVAC equipment. In Portfolio Manager, operating hours for office buildings are defined as the total number of hours during the week when the majority of tenant employees are present and working in the space. This typically corresponds to the building or tenant's "lease hours."

Operating hours do not include times when only a handful of workers are present or working overtime, or when security or janitorial staff members are the only people present. But if a particular tenant actually has extended hours – at least 10 hours per week longer (or shorter) than the rest of the building – the tenant's square footage should be input separately from the general office building space type in Portfolio Manager.

If operating hours vary throughout the year, either use a weighted average or update the data as needed. For example, an accounting firm may operate 110 hours per week for three months around tax season and 50 hours per week the rest of the year; using a weighted average of 65 weekly hours year-round is acceptable. This tenant only needs to be separated out if the 65 weekly hours are at least 10 hours longer than the remainder of the tenants' hours.

Parking area operating hours are defined as the weekly hours of access – whenever the parking structure or lot is available for tenants and guests to use. If there is no restriction on when a car can enter a parking structure or lot, input 168 hours, regardless of how long the lights or ventilation systems operate.

Many people assume that the rating system penalizes a building if it has long operating hours (or high worker and PC counts, or large data centers). But in fact, accurately representing these characteristics in Portfolio Manager generates a higher rating than if the Portfolio Manager user input artificially low

worker/PC counts or operating hours or did not separate out data centers. This is because the rating is a measure of how much energy a building actually uses as compared to what it is predicted to use (given its operational characteristics, size, local climate, etc.). In the call center example, inputting a separate space for that tenant – having weekly operating hours of 168 – results in a slightly larger predicted "energy budget" for comparison. If the building is using less energy than the expected amount, then the rating will be higher. However, if the operating hours were minimized or input at a lower level, the model would assign a smaller predicted "energy budget" and the rating might actually fall because the building is still using the same amount of energy per hour of operation.

In another example, if lease hours include some weekend hours, it is acceptable to include those hours in the total even if no tenants are present in the building on Saturdays. That way, if a property management team takes the energy-saving step of conditioning on the weekend only when tenants are actually there, they'll be rewarded with a higher rating. The tenant's needs (the availability of the building on weekends) are being met with lower energy usage (providing Saturday HVAC only upon request).

ENERGY METERS

A common error is to overlook meters from a tenant that is using energy from the base building systems, such as a retail tenant that's on the base building cooling water loop or domestic hot water but is separately metered for lights and other electricity use. All of these tenants' additional energy usage must be included. Also, check for after-hours usage that is billed back to tenants, which must be included regardless of who is paying for the energy.

Another common mistake is selecting the wrong unit of measure when setting up an energy meter in Portfolio Manager. Check the utility invoices for the right units, but also pay attention that the level of magnitude (hundreds, thousands, or millions) is being represented the same in Portfolio Manager as it is on the utility bill. This is especially important with district energy, which often uses the indicator "M" to mean thousands, whereas Portfolio Manager uses "M" to mean millions.

INDUSTRY STANDARDS

The ENERGY STAR label is an indicator of superior quality and performance, and has a process built in to confirm that the label is only awarded to buildings that are both energy efficient and also provide a quality environment for occupants. After all, the quickest way to use less energy is to turn off all the lights and ventilation systems, but that's not the intent of the program.

A major component of the PE's review is to verify that the building meets some basic industry standards for comfort, quality, and lighting, ensuring that these are not being sacrificed for energy conservation. Some aspects of this are up to the PE's professional judgment.

Thermal comfort conditions in the building should meet the standards outlined in ANSI/ASHRAE Standard 55. This requirement applies to the building as a whole; a few areas with isolated problems shouldn't invalidate the building from earning the ENERGY STAR, as long as there are plans in place to fix the problems and the plans are available for the PE to review. The following may be signs that the building does not meet the standard:

- Personal fans or space heaters
- Open windows (unless it is an occupant-controlled, naturally ventilated space)
- Window or through-the-wall room air conditioners
- Covered or altered supply air diffusers
- Altered or broken thermostats
- People wearing coats in the office

Building ventilation needs to meet ASHRAE Standard 62, providing adequate outside air at all times. Again, one or two rooms with an issue are not grounds for failure if there are strategies in place to address the problems.

A third standard the building must meet is IESNA minimum lighting levels. The lighting values associated with the standard are available in the ENERGY STAR PE guide (see "For More

Information"). However, light levels in office buildings are typically met without an issue, as tenants are bound to complain if they feel their offices are too bright or too dim.

STAYING CURRENT

Buildings are constantly changing and evolving, and maintaining accurate data in Portfolio Manager can be challenging. Even after obtaining the ENERGY STAR label, keep your data current to ensure that Portfolio Manager is giving an accurate representation of energy performance, setting yourself up for renewed certification the following year. Up-to-date ENERGY STAR data will also create value by allowing you to spot trends – either downward or upward – in performance and respond quickly to problems.

Designate an individual at the property to input monthly energy consumption and costs, and periodically update space data based on changes in vacancy or operations. Provide clear accountability for data maintenance. If done regularly, it will only take a few minutes each month.

THE BOTTOM LINE:

The ENERGY STAR label is a measure of quality in today's real estate market, where building energy performance is under increased scrutiny. Streamline the certification process by understanding the Portfolio Manager data inputs and the required building operation standards in advance of your ENERGY STAR label application.

USEFUL LINKS:

ENERGY STAR Professional Engineer Guide: www.energystar.gov/ia/business/evaluate_performance/pm_pe_guide.pdf

ENERGY STAR live online training: https://energystar.webex.com (trainings include benchmarking for office buildings, hotels, multifamily communities, and more)

ENERGY STAR recorded training sessions: https://energystar.webex.com Recorded Sessions (relevant trainings include *Professional Engineer Guidance: ENERGY STAR for Commercial Buildings and Office Buildings: Rating Energy Performance Using EPA's Portfolio Manager*)

ASHRAE standards: www.ashrae.org

IESNA Lighting Handbook: www.ies.org/store/department/lighting-handbooks-10001.cfm

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