

# Energy Usage Intensity (EUI) FAQs

## What is EUI?

Energy Usage Intensity (EUI) is a simple measurement of a building's energy use, expressed as energy used per square foot, per year. It describes how energy efficient a building is.

There are two types:



Site EUI refers to the amount of energy (e.g. gas and electricity) a building consumes.



Source EUI is site energy plus the primary and secondary fuel that the power plant used to produce the energy used. In other words, it's the entire energy chain as it takes all energy use into account.

## Why should we track EUI?

Lower utility expenses lead to higher Net Operating Income (NOI), making your property more profitable.

Measuring and tracking EUI helps us understand a building's energy performance. It makes it possible to compare buildings that vary in location, size, and use-type. For example, if we compare three office buildings and one has a higher EUI than the rest, it's likely that there are energy reduction opportunities to consider that would lower EUI and decrease utility expenses.

## How is EUI calculated?

Site EUI is measured by dividing a building's total annual energy consumption – gas (therms), electric (kWh), and alternative energy inputs – by the total gross floor area. Since EUI is measured in thousands of British Thermal Units (kBtus) per square foot per year (kBtu/ft<sup>2</sup>/year), each energy use must be converted to Btus to ensure an “apples to apples” comparison.

The simplest way to calculate EUI is by using ENERGY STAR® Portfolio Manager, which will calculate both the site and source EUI.

To calculate site EUI by hand, determine the amount of electricity, gas, and any other energy inputs consumed in a year. Convert each of those energy inputs into kBtus and calculate the total sum. Divide the total kBtus by the building's gross square footage.

## What variables can impact EUI?



Are there spaces within the building that use more energy than others like a cafeteria or data center?



What types of tenants are in the building? Are they office workers or is it a 24/7 call center?



Does the climate or location impact overall energy use? Is it located in a hot or cold area?

## What tools calculate and/or track EUI?

The two free tools commonly used are for calculating and/or tracking EUI are U.S. Environmental Protection Agency's (EPA) ENERGY STAR Portfolio Manager and the Zool Tero.

### ENERGY STAR Portfolio Manager

ESPM is a free online tool that makes it easy to track energy, water, and greenhouse gas emissions for one building or an entire portfolio.

Since nearly 25% of the U.S. commercial building stock uses ESPM, it's an excellent tool for understanding how a building and/or portfolio performs relative to others.

### Zero Tool

The Zero Tool is used to compare a building's EUI with similar building types, understand how a building achieved its EUI (via energy efficiency, on-site renewable energy, and/or green power purchases), and set EUI targets.

A Zero Score allows properties and building codes to be compared based on their relative 'percent from zero', allowing for normalized property and code comparisons across diverse locations, space use types, and building characteristics.

## What practical applications utilize EUI?

- Major construction or renovations seeking utility incentives
- Building automation, management, or find & fix it utility programs
- ENERGY STAR, LEED, Living Future, Net Zero, 2030 Challenge and Whole Building Projects

## How can I compare buildings?

The Commercial Building Energy Consumption Survey (CBECS) provides energy usage data on a variety of commercial building types. The data - including EUI information - is collected via a national sample survey of commercial buildings. The CBECS report allows commercial owners and managers to benchmark buildings against EUI, size, location, energy sources, and building systems.

## What approaches lower EUI?

For properties looking to improve EUI and increase building performance, we recommend a tiered approach to energy savings.

- 1 Use building assessments to evaluate savings potential
- 2 Target low and no-cost projects such as temperature setpoints and lighting schedule adjustments for simple, immediate savings
- 3 Tackle "low-hanging fruit" projects with payback periods between 1-5 years to increase NOI and support capital investments
- 4 Plan for "capital projects" with longer payback periods, leveraging money from operational savings to execute energy-saving projects with higher upfront investment
- 5 Determine feasibility for on-site or off-site renewable energy to offset operational costs further and decarbonize building