

ENERGY UTILIZATION INDEX (EUI)

Energy auditors use a measure called ***Energy Utilization Index*** or ***Energy Use Index, "EUI"*** to enable comparisons between different buildings and energy types. The measurement of EUI is the amount of energy consumed (measured in Thousands of British Thermal Units {MBTU's}), and divided by the gross conditioned area in square feet. The Energy Use Index is the most common means of expressing the total energy consumption for a building and provides information similar to "average gas mileage" of your car. This value, when used as a comparison between functionally similar structures, will show those with higher EUI have to be less efficient than those with lower EUI's.

The EUI also allows you to once again compare apples to apples. Most likely, a larger house will consume more energy than a small house, but just because the small house's energy bills are lower; does it mean it is also more energy efficient?

This data allows energy managers to construct a *base year*. Normally the base year is the observed EUI before an energy program is started.

Alternatively, the base year can be the average energy use per square foot of the last three years. Changes in energy use can then be seen over time. Obtaining accurate values for the data used in

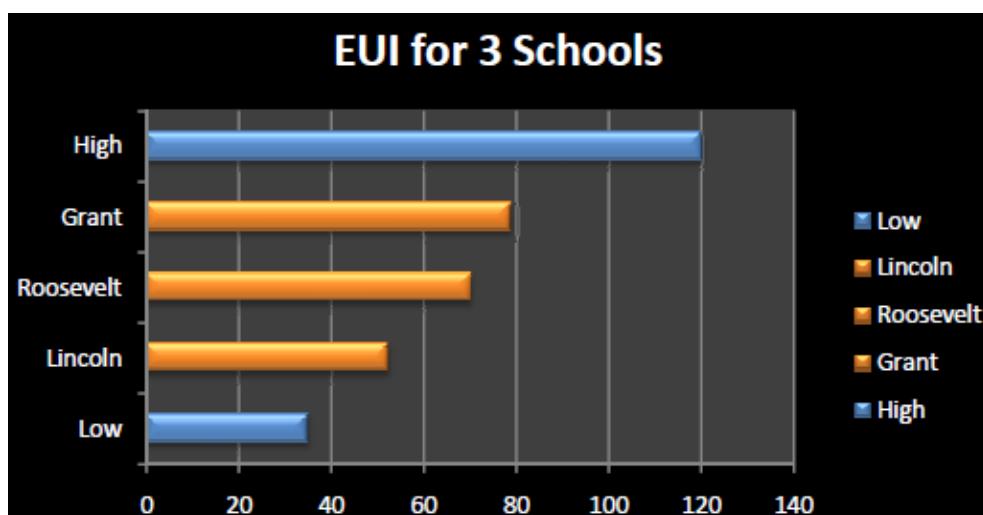
your audit such as square feet of conditioned space and careful selection of the base year is critical. Other factors such as climate and size of the student population may be of importance.



Investigative Question #7:

Have you ever heard your grandparents say something like, "When I was your age, I could buy a candy bar for a nickel!" As you know the cost of living continually rises, as the price of goods also rise. Explain why monitoring the EUI of a building is better than just monitoring the cost of the bills.

The graph here shows an example of what you can do with the EUI number. For this example school district, we will say that the lowest building in the district had an EUI of 35, and the highest was 120. Three schools, Grant, Lincoln, and Roosevelt have been graphed. Using a graph allows you to visually and easily compare energy consumption relative to similar building types or to track consumption from year to year in the same building.



The BEPS (Building Energy Performance Standards) is another way to benchmark and verify energy consumption in a specific facility. It is important to be aware of the varying factor **heating and cooling degree days**, which directly influences whether the EUI shall increase or decrease. Again, an energy audit is a most important tool in your energy management program. Remember, if energy cannot be measured, it cannot be controlled.

Think about it

What are heating and cooling degree days?

Heating engineers who wanted a way to relate each day's temperatures to the demand for fuel to heat buildings developed the concept of heating degree days. To calculate the heating degree days for a particular day, find the day's average temperature by adding the day's high and low temperatures and dividing by two. If the number is above 65, there are no heating degree days that day. If the number is less than 65, subtract it from 65 to find the number of heating degree days.

For example, if the day's high temperature is 60 and the low is 40, the average temperature is 50 degrees. 65 minus 50 is 15 heating degree days.

Cooling degree days are also based on the day's average minus 65. They relate the day's temperature to the energy demands of air conditioning. For example, if the day's high is 90 and the day's low is 70, the day's average is 80. 80 minus 65 is 15 cooling degree days.

Source: www.usatoday.com/weather/resources



A cool website to look up past heating and cooling degree days: www.degreedays.net



Investigative Questions #8:

Go to weather.com and find to help you find the following information to answer the questions below.

Yesterday's Date: _____

Yesterday's High Temperature: _____

Yesterday's Low Temperature: _____

Yesterday's Average Temperature: _____

Is today a heating or cooling degree day, and by how much? _____

Review the chart shown below, what can you deduce from the information shown?

