Benchmarking Industrial Energy Performance

Your key to unlocking savings

The simple choice for energy efficiency.

ENERGY STAR

Through ENERGY STAR®, the U.S. Environmental Protection Agency helps thousands of manufacturing plants manage energy across their operations. If you're just starting to manage your facility's energy use, this guide will give you an overview of EPA's energy benchmarking tools for select industries.

Why is energy management important?

Mitigate volatility

Save money

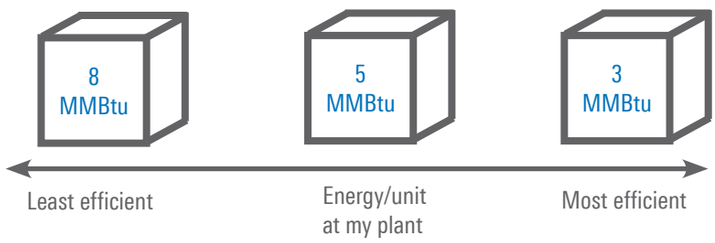
Motivate staff

Reduce pollution

Since energy impacts your business, benchmarking will help you measure how efficient you are.

What is energy benchmarking?

Benchmarking with ENERGY STAR tells you how your facilities perform against others with similar characteristics. It helps you determine whether a manufacturing plant is efficient. Improving efficiency can save you money.



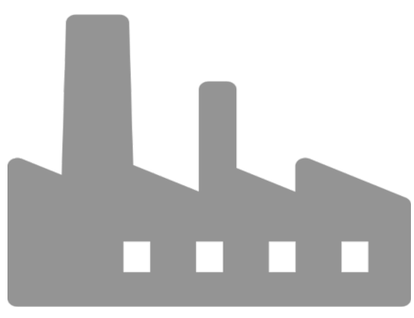
Benchmarking energy performance

The U.S. Environmental Protection Agency (EPA) works with industry to develop sector specific benchmarking tools called plant energy performance indicators (EPIs). EPIs determine how efficiently a whole plant uses energy compared to others in its industry. Manufacturers enter data affecting energy usage into the EPI to calculate energy intensity and to score the facility on a 1—100 scale. Read on to learn more about how EPIs work.

1 EPIs benchmark whole plants

EPIs benchmark the energy efficiency of the whole plant rather than an individual process. EPIs are available for the following industries:

- Automobile Assembly
- Cement Manufacturing
- Commercial Bread & Roll Bakery
- Container Glass Manufacturing
- Cookie and Cracker Bakery
- Flat Glass Manufacturing
- Frozen Fried Potato Processing
- Integrated Paper and Paperboard Manufacturing
- Integrated Steel Manufacturing
- Juice Processing
- Metalcasting
- Pharmaceutical Manufacturing
- Pulp Mill
- Wet Corn Milling



Benchmarking Industrial Energy Performance (cont.)

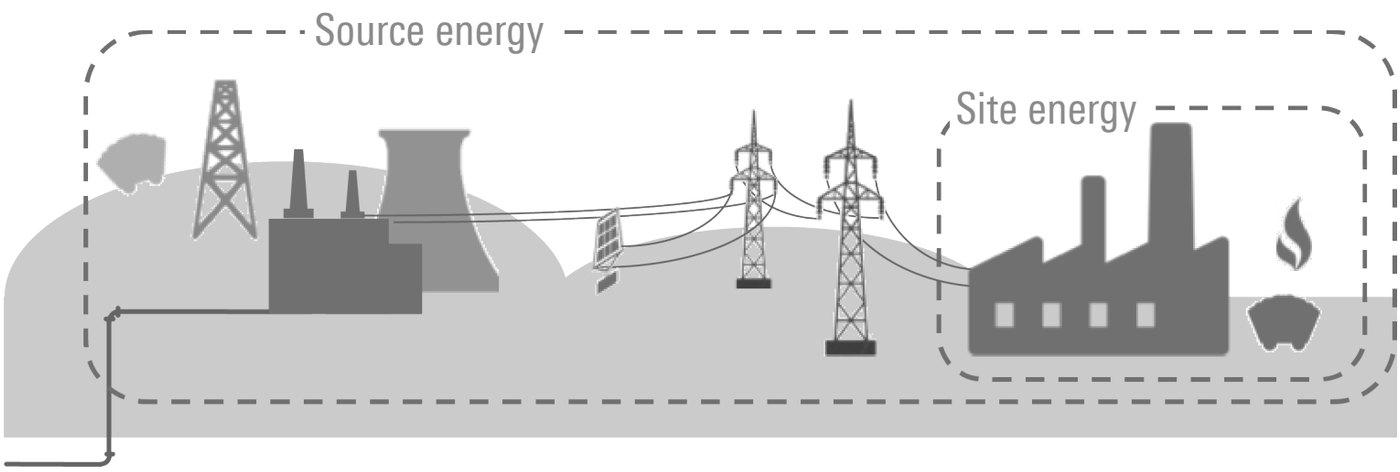
2 EPIs account for differences between plants

ENERGY STAR EPIs adjust (normalize) for the differences between plants, such as the ones below, to ensure fair comparison within an industry. When using an EPI a facility enters its own data for each variable.

- Products and materials
- Plant size
- Weather
- Hours of operation

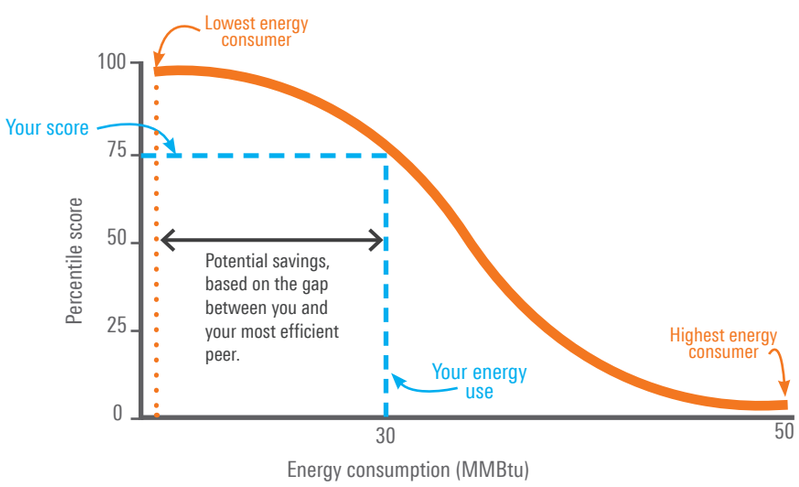
3 EPIs consider all energy types

EPIs evaluate all energy consumed to calculate your score. You enter the amount of electric and thermal energy used at your plant (site energy). The EPIs convert the site energy to the equivalent source energy values, accounting for all losses incurred while producing and delivering the energy to your plant. Source energy provides a complete assessment of the amount of energy consumed to produce your product.[1]



4 EPIs model energy performance

Using plant attributes and source energy data, EPIs show how superior, average, and poor energy performance looks for a plant like yours. The span of the performance curve also represents the energy performance distribution of your industry and shows where you place among your peers.



Y-Axis: Percentile score

Shows the percentile of the highest (100) and lowest (1) performers. A plant's percentile is based on where its consumption intersects with the curve.

X-Axis: Energy consumption

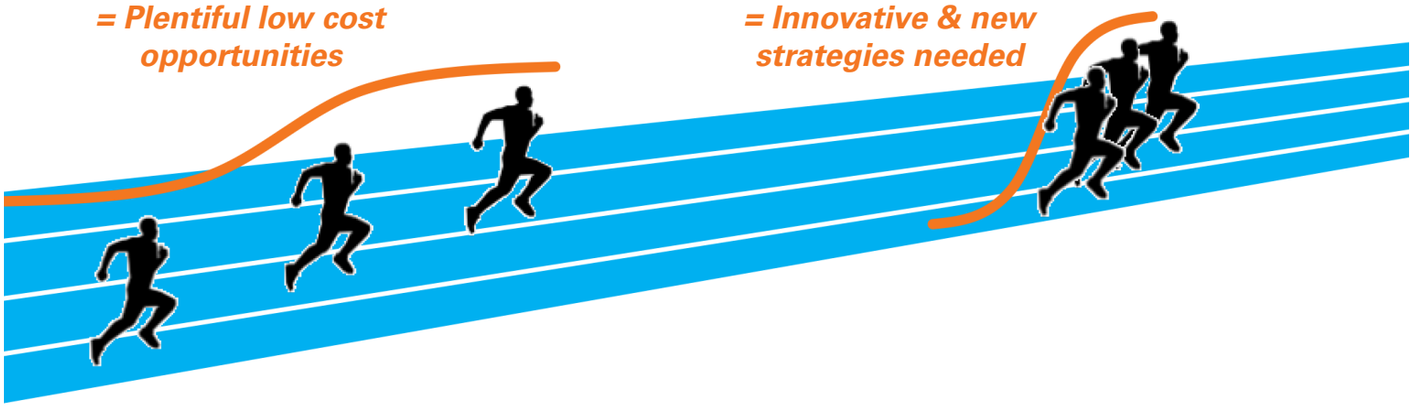
Displays the amount of energy a plant would use based on its sector and the conditions in which it operates. Where a plant falls on the curve represents the amount of energy the plant consumes.

[1] For more information on the benefits of using source energy and conversion ratios see https://portfoliomanager.energystar.gov/pdf/reference/Source%20Energy.pdf

Benchmarking Industrial Energy Performance (cont.)

INDUSTRY A
Wide performance range
= Plentiful low cost opportunities

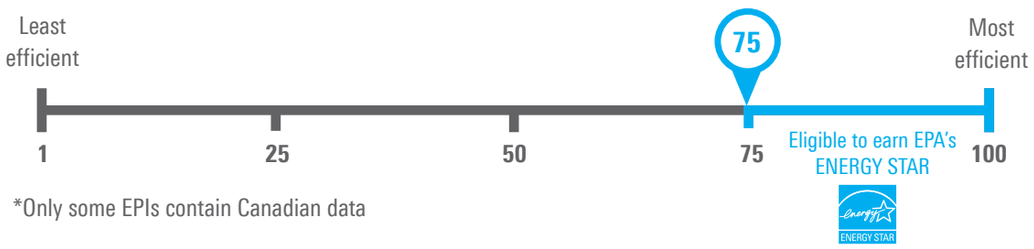
INDUSTRY B
Similar performance
= Innovative & new strategies needed



5 EPIs score plant performance

Your score shows the percent of similar plants your plant outperforms. A score of 75 or higher means your facility is a top performer — and eligible for ENERGY STAR certification. ENERGY STAR certification acknowledges superior energy performance for the top 25% of industrial facilities in the U.S. and Canada*. For application instructions visit www.energystar.gov/plants.

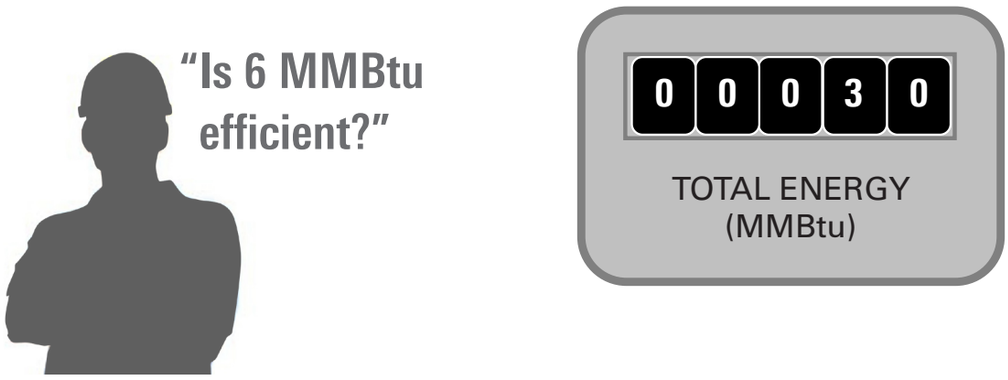
EPA's ENERGY STAR 1 – 100 Energy Performance Scale

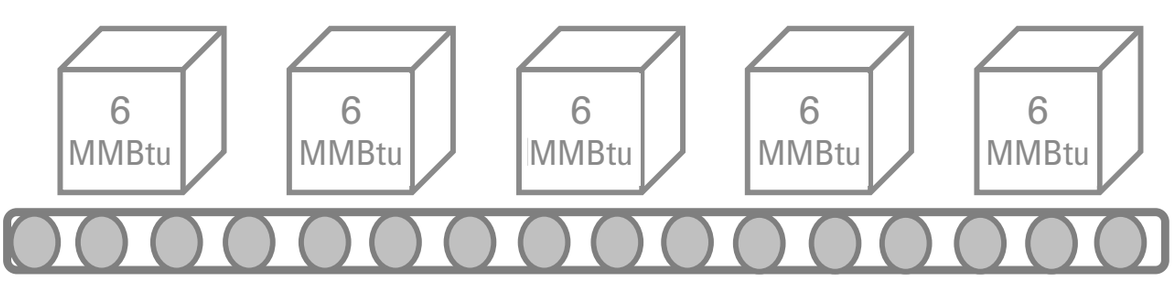


*Only some EPIs contain Canadian data

6 EPIs go beyond energy intensity

Energy intensity (EI) measures the amount of source energy it takes to produce one unit of product. Energy intensity alone does not tell you if your plant is efficient. EPI scores and performance curves provide a context for EI. EPIs score a plant based on its operating characteristics and provide additional information on the plant's energy performance.



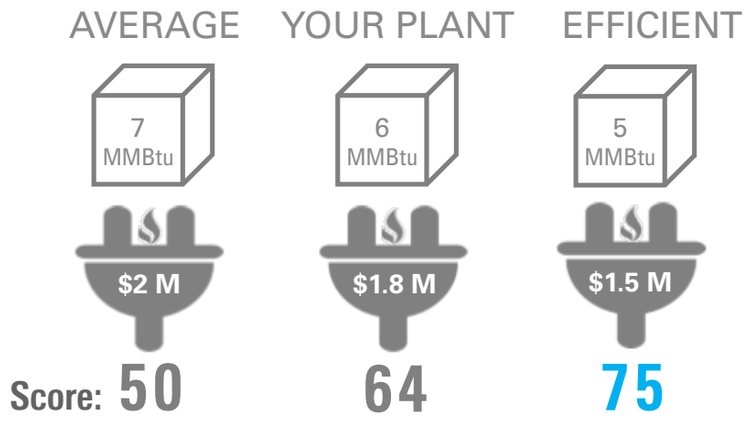


EI = Total MMBtu / Number of Units

7 EPIs inform goals

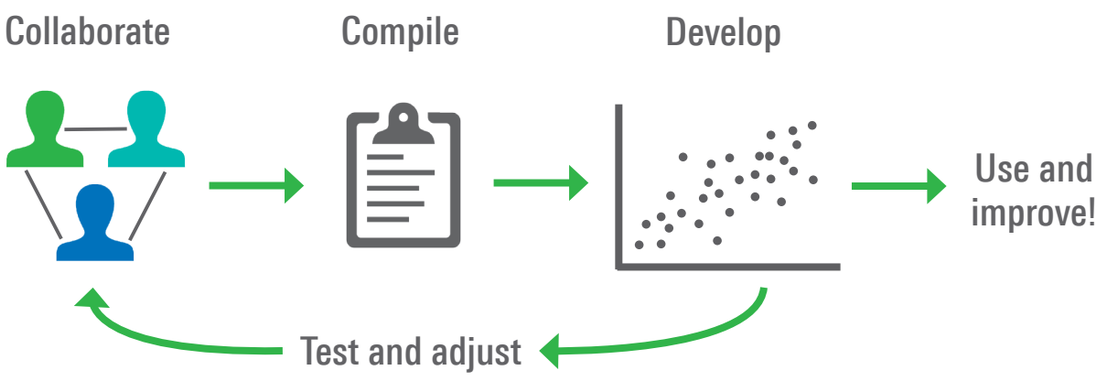
EPIs show the expected energy intensity and dollars spent on energy for average and efficient plants with your plant's characteristics. Use the EPI to set realistic improvement goals.

Right: By achieving efficient performance (75 or higher), the plant in this example can save $300,000.



How are benchmarks developed?

EPA collaborates with industry to develop and test EPIs. Energy and production data from the Economic Census, Annual Survey of Manufactures, Manufacturing Energy Consumption Survey, and industry inform an EPI's development. Attributes which affect energy use are evaluated for inclusion in the EPI. The EPIs go through several rounds of industry review and testing prior to being released for industry to use. No sensitive business information is revealed during the development or use of the EPIs.



Why benchmark with ENERGY STAR?

- Inform goal setting
- See how you compare to the competition
- Identify gaps
- Find cost savings still to be made
- Be recognized by EPA
- Show you're a leader in energy management
- Your competitors are already benchmarking

For more information, or to get started benchmarking your plant, visit www.energystar.gov/epis.