ENERGY to care

Greater efficiency supports patient care.

Establish a baseline for current energy consumption

All ECM content was independently developed and reviewed to be vendor-, product-, and service provider-neutral.

Description

Information collected by measuring a building's energy performance for a minimum of 12 months (36 months preferred) will establish a baseline for energy consumption. This baseline can serve as a starting point for setting energy efficiency improvement goals as well as a comparison point for evaluating future efforts and trending overall performance.

Note: If a facility is sub-metered, a baseline can be developed for each separately sub-metered area in addition to the whole-building baseline.

Project Talking Points

- Establishing a baseline will provide a basis by which one can improve and compare to.
- High-performing facilities can be identified for recognition, replicable practices, and will benefit more from fine tuning or introducing renewable energy.
- Poor-performing facilities have more opportunity for quick payback energy improvement and savings.
- Historical energy use trends can be used as a context for future actions and decisions.
- The information gathered can be used to establish a threshold for initiating retro-commissioning activities and rewarding good performance.
- Weather normalization can help give context to whether energy savings or increases are due to weather.
- Establishing a "base load" will give a facility an indication of how much of their energy use is weather dependent. Do not confuse this term with weather normalization, which simply is a comparison tool.
- Heating and Cooling Degree Day Data can be obtained to help determine weather related differences.
- Submetering and circuit-level metering can provide more detail into a facility's energy use.
- "Demographic information" such as square footage and operating hours are important metrics to compare buildings of different sizes and usage types.

Triple Bottom Line Benefits

- **Cost benefits:** Reducing costs and consumption starts with understanding the existing conditions. By establishing this benchmark, one can measure how much improvement has been made.

- **Environmental benefits:** Establishing a baseline is an important first step toward addressing and reducing energy consumption in a facility. The ENERGY STAR Portfolio Manager Tool allows facilities to track changes in greenhouse gas emissions compared to the benchmarking baseline year. Therefore, continuing the benchmarking effort documents the environmental impact of your energy management efforts.

- **Social benefits:** Employee and community engagement in efforts to reduce energy consumption is often improved when data, information, goals, and targets are provided. Using a simple 1-100 score provided by ENERGY STAR can be a great way to convey a message everyone can understand.

Purchasing Considerations

- Before purchasing a tool to track energy use, consider free tools such as ENERGY STAR Portfolio Manager or simply start out by using Microsoft Excel or an equivalent spreadsheet program

How-To

1. Engage all stakeholders. This could include facilities staff, finance and/or outside consultants. Ensure all stakeholders have regular access to necessary information
2. Gather at least 12 months (36 months, if possible) of monthly utility data from utility bills (e.g. electricity, natural gas, water, etc.). This data should be readily available from the utility. Submeters should be noted during this phase.

    - Note: If you are using ENERGY STAR Portfolio Manager, water will not factor into an ENERGY STAR score

3. Analyze monthly utility bills to identify overall trends, seasonal fluctuations, and unexplained changes in energy use.

    - Comparing the same month year over year is an easy way to spot outlier usage patterns. Incorporating Cooling and Heating Degree Days will further help in determining whether usage is abnormal.

- Conversion to units per square foot will help to recognize disparities caused by changes in a building's square footage. Combining the usage for different energy types (e.g. electric and natural gas) can be accomplished by converting to British Thermal Units (BTUs).

- Establish a "base load" for your facility. This is much easier in a facility where electricity is used for the building's cooling needs and natural gas (steam or propane) is used for the building's heating needs. A base load can help narrow the focus on improving performance.

4. Create an account with ENERGY STAR Portfolio Manager https://energent.link/PM. For help getting started, use the following resources:

   - Portfolio Manager Overview
   - Portfolio Manager Training
   - Portfolio Manager Quick Start Guide
   - Portfolio Manager Data Collection Worksheet

5. Create your building in ENERGY STAR Portfolio Manager. You will need different "demographic" information based on your building type (reference the Data Collection worksheet from above) and enter utility data.

6. Note your facility's baseline ENERGY STAR score. The score is a percentile of your performance compared to similar building types. If the score is a 50, it is more efficient than 50% of like building types across the country. If the score is 75 or higher, your facility falls into the top 25 percent of energy-efficient buildings of your property type in the United States and is eligible to receive ENERGY STAR certification. The certification is valid for one year and requires third-party validation of performance. This process can be performed every year the facility qualifies. For additional information about how to apply for the ENERGY STAR label, visit https://energent.link/overview.

7. Trend and track ENERGY STAR scores and energy use over time to demonstrate improvements or to spot problem areas before they linger.

8. Use the ENERGY STAR Portfolio Manager's goal tab to set your goals.

9. Consider the use of submetering and circuit-level metering to identify and track specific end users and reductions.

10. Consider using the free, data visualization dashboard offered through ASHE's Energy to Care https://energent.link/E2C program to track energy progress and potentially receive awards for your efforts. You can also join the "chapter challenge" to compete with other ASHE Chapters in an energy saving competition.

Tools

- Sustainability Roadmap for Hospitals
  - https://energent.link/roadmap
- Weather Data in Degree Days
  - Degreedays.net
  - NOAA.gov
- ENERGY STAR Portfolio Manager

Case Studies

- Gunderson Lutheran Health System
  - The facility faced a $500,000 estimated annual increase in health system's electricity and natural gas bill if annual price increases hold constant.
  - Analyzed 10+ years of utility bills to establish the health system's energy baseline.
  - Calculated total reductions in energy consumption including kilowatt hours per year and cubic feet of natural gas per year.

- Saint Francis Care
  - Awarded Energy Star label every year since 2003.
  - Continuous improvement in energy efficiency linked to monitoring the difference between baseline energy use and current use.

- Sierra Nevada Memorial Hospital
  - Used Energy Star Portfolio Manager to track annual energy use.
  - Calculating an energy baseline at the hospital supported its health system's efforts to adhere to the CERES (Coalition for Environmentally Responsible Economies) https://energent.link/ceres principles for environmental stewardship.

- Tri-City Medical Center
  - Used Energy Star Portfolio Manager to compare energy use against their own baseline and against other hospitals of similar size

Regulations, Codes and Standards, Policies

- U.S. Energy Policy Act 2005, Section 103
- U.S. Energy Infrastructure and Security Act 2007, Section 432
- U.S. Department of Energy, Energy Efficiency & Renewable Energy
  - Building Energy Codes Program
- American Society for Heating, Refrigerating and Air-Conditioning Engineers https://energent.link/ashrae

    - Standard 90.1: Energy Standard for Buildings Except Low-Rise Residential Buildings https://energent.link/90
    - Guideline 14: Measurement of Energy and Demand Savings https://energent.link/14
- American Society for Healthcare Engineering https://energent.link/ashe
    - Energy Efficiency Commitment Initiative https://energent.link/overview
- U.S. Environmental Protection Agency
    - ENERGY STAR Program https://energent.link/ES

ECM Synergies

All energy ECMs https://energent.link/PIMS

Educational Resources

- ASHE Monographs
- ENERGY STAR Portfolio Manager Training
- Energy University Courses

More Resources

- American Society for Healthcare Engineering
    - ASHE Healthcare Energy Guidebook
- U.S. Department of Energy, Energy Efficiency & Renewable Energy Building Technologies Program Tools:
    - Hospitals Realize Fast Paybacks from Retrofits and O&M Solutions
    - Hospitals Realize Greatest Savings Through Formal Energy Management Program
- U.S. Environmental Protection Agency (EPA), ENERGY STAR Tools:
    - Benchmarking to Save Energy
    - Guidelines for Energy Management
- American Society for Heating, Refrigerating and Air-Conditioning Engineers
- BetterBricks Performance Indicators, Benchmarking
- Lawrence Berkeley National Laboratory
    - High Performance Healthcare Buildings: A Roadmap to Improved Energy Efficiency
    - Hospital Energy Benchmarking Guidance - Version 1.0
- LCB Healthcare Consortium
    - Low Carbon Buildings in the Healthcare Sector
- National Renewable Energy Laboratory
    - Healthcare Energy Metering Guidance
- U.S. Agency for International Development

    - Powering Health Energy Management in Your Facility
- International Performance Measurement and Verification Protocol
    - Volumes 1 & 3 are appropriate for energy measurement. Volume 2 is for IAQ.

ECM Descriptors

Energy

Category List:

- Measurement and Reporting
- Strategic Operations

ECM Attributes:

- Optimize Operations
- Repair or Optimize Existing Systems (fix what you have)

Improvement Type:

- Commission/Retro-Commission
- Retrofit/Renovations
- New Buildings
- Operations and Maintenance

Department:

- Engineering/Facilities Management