

BUILDING PERFORMANCE  
MANAGER™

OVERVIEW

JULY 22, 2010



*Building Solutions. Building Performance.*

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# Building Performance Manager™

The Building Performance Manager (BPM) is a collection of value-added services to assist you in reducing your energy and operating costs.

## Structure

BPM is a suite of applications and services providing you with a variety of features to match your needs and budgets.

The components of BPM are:

- Energy Benchmarking
- Fault Detection and Diagnostics
- Building Efficiency Reports
- Building Efficiency Analysis
- Environmental Index
- Plant Efficiency Reports
- Plant Efficiency Analysis
- Regulatory Reporting
- Access System Management

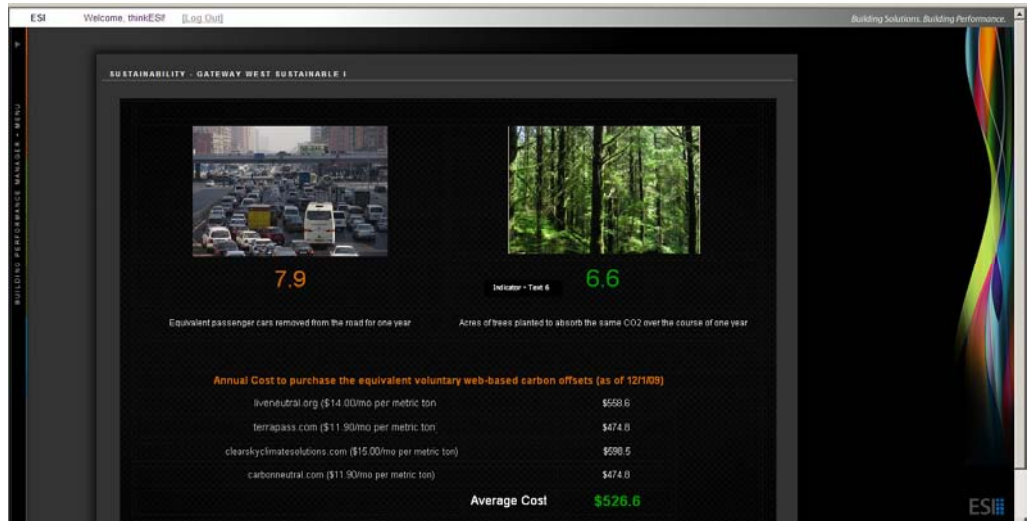
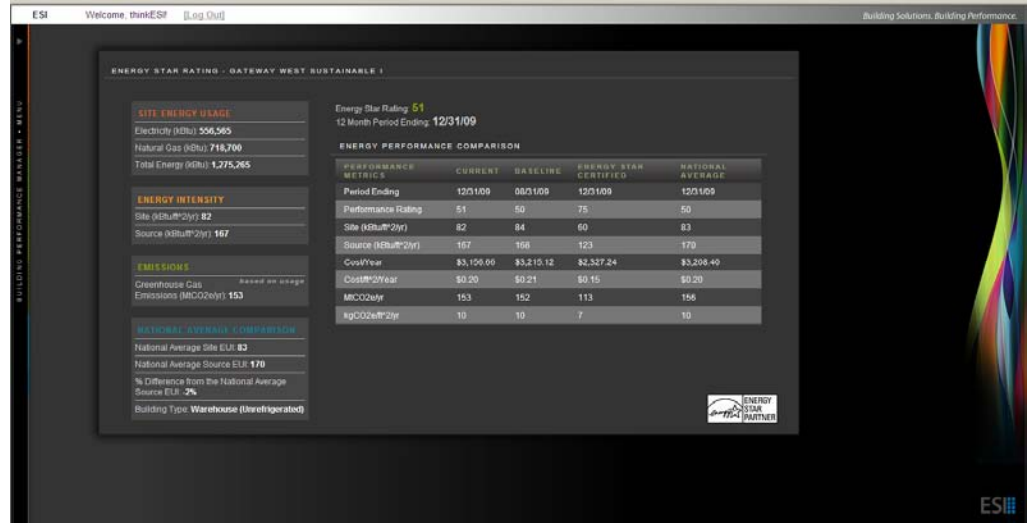
## Energy Benchmarking Feature

Energy Benchmarking includes an Energy Star rating of your building(s). An account is setup that provides you with information including six data points:

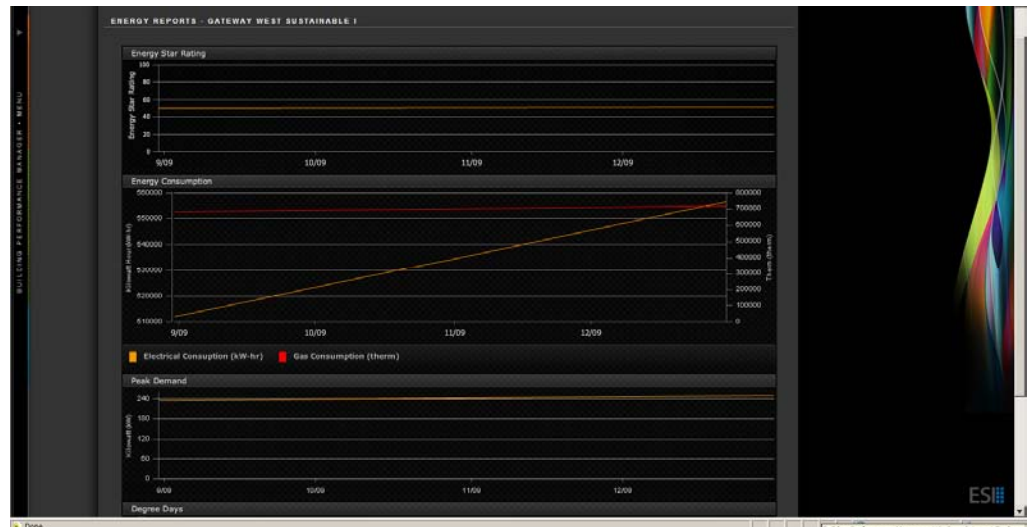
- Energy Star Rating
- Building kW
- Building kWh
- Building Steam, Gas, or Oil
- Building Heating Degree Days
- Building Cooling Degree Days

Initially, your building(s) are setup in the Energy Star Portfolio Manager. The output of this information is the Energy Star rating. Environmental calculations (carbon calculations) are provided based on the data points listed above.

The building is setup in the Portfolio Manager, the environmental calculations are provided, and data is updated monthly. Charts are provided to show the monthly trends of the six data points.



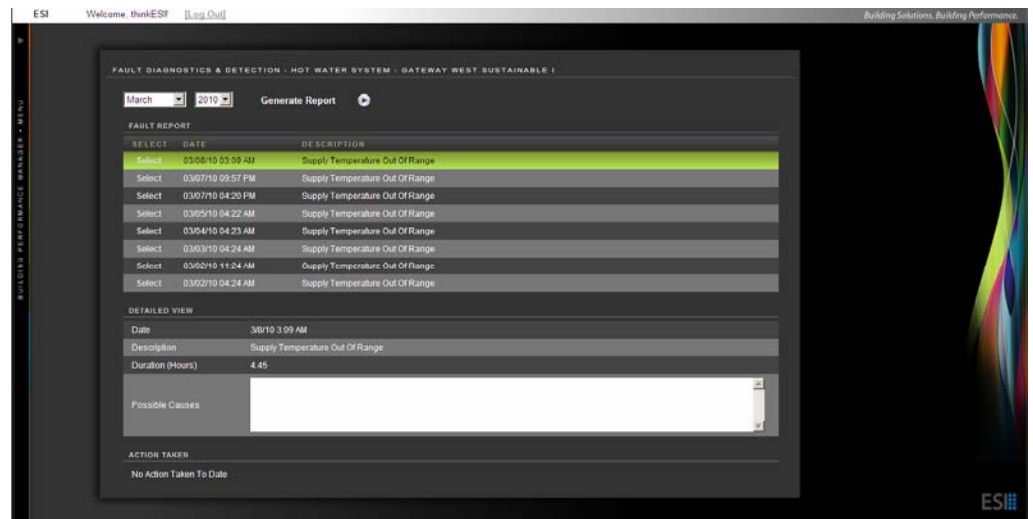
### Energy Benchmarking views



Monthly chart views

## Fault Detection & Diagnostics Feature

Fault Detection & Diagnosis (FDD) creates a web-enabled HVAC automated diagnostics system that detects and reports equipment performing outside normal parameters. Operators use automated FDD reporting to correct problems in their building HVAC systems and obtain corresponding benefits of better building environments, increased equipment life, and reduced energy use.



Setup of the FDD algorithms for defined pieces of equipment is provided. The software algorithms and tuning provide continuous detection of abnormal or

deteriorating conditions so that energy waste caused by malfunctioning equipment is minimized and maintenance issues are detected early so repairs are timely and less expensive. E-mail alerts can be sent to designated recipients. Monthly reports of alert summaries will be provided via the Building Performance Manager.

## Building Efficiency Reports Feature

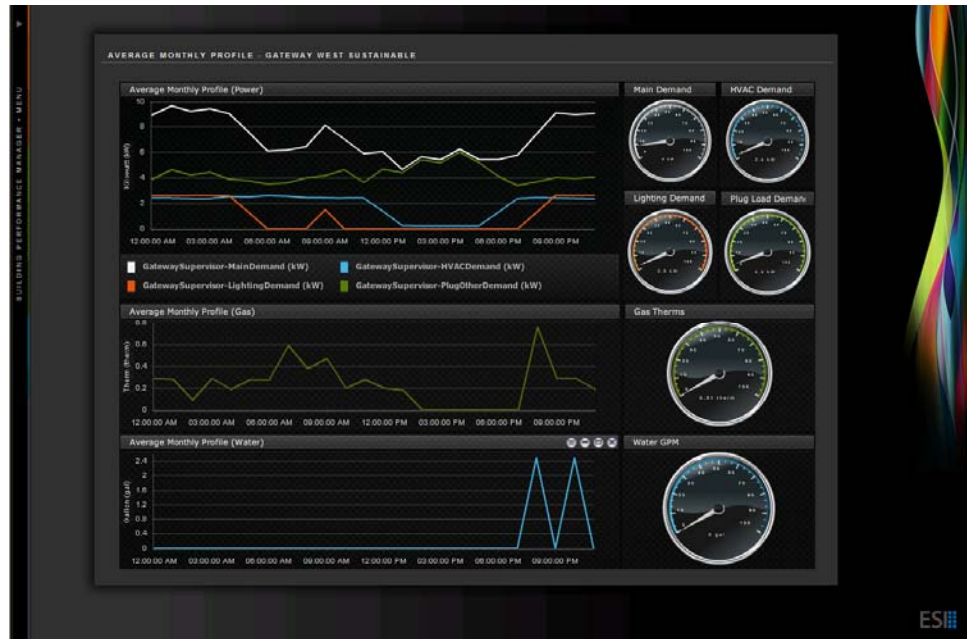
Measurement and analysis is key to knowing how your facility is consuming energy and to how you are managing it. Further, it provides real-time feedback on the effects of energy conservation tactics that have been implemented to guide the management of these tactics for optimum facility performance. This option provides monthly reports and dashboards of key building operating data; overall consumption of electric, gas, degree days and weather. These data points, when measured individually or collectively, provide a valuable tool for monitoring and managing a building's efficiency.

## Building Efficiency Reports Feature

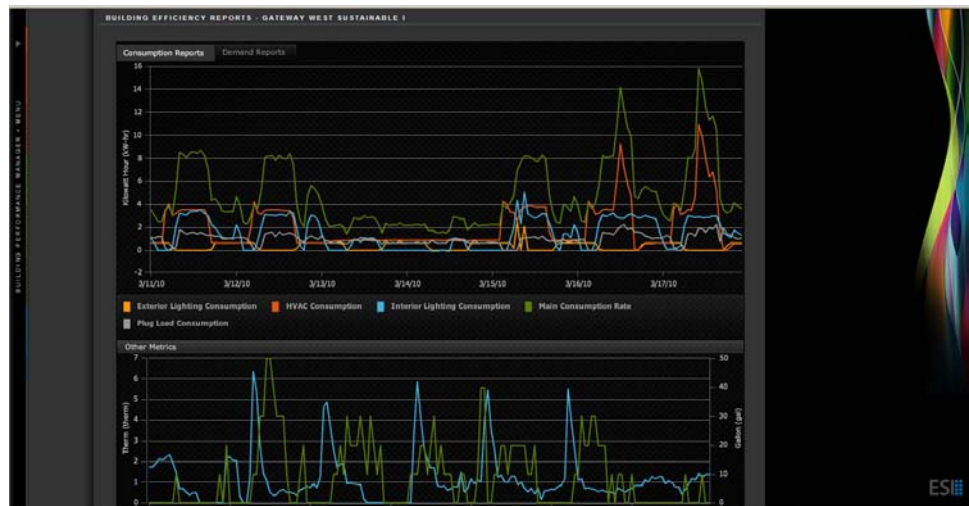
Basic reports can be selected for individual data points. These reports allow the user to view a single data point for the time period selected, as well as baseline data for the data point from the same period one week ago, one month ago or one year ago.



Energy consumption view



Energy profile view



Energy analysis view

### Building Efficiency Reports Feature - Analysis Option

This option provides monthly analysis of key building operating data. In addition to the reports, the Building Efficiency Analysis option provides analysis and commentary for each data point including correlation, anomalies, and recommendations for conservation, cost reduction, and operation.

## Environmental Index Feature

Rising energy costs are an important consideration, but the energy costs for a typical building are very small when compared to the cost of the people who work in these buildings. Research shows that a one percent increase in productivity can save more money than the entire energy cost of the building.

This feature provides a monthly report of the building's (or area) Environmental Index (EI). As a general rule, office temperature and humidity are matters of human comfort. OSHA has no regulations specifically addressing temperature and humidity in an office setting. However, Section III, Chapter 2, Subsection V of the OSHA Technical Manual, "Recommendations for the Employer," provides engineering and administrative guidance to prevent or alleviate indoor air quality problems. Air treatment is defined under the engineering recommendations as, "the removal of air contaminants and/or the control of room temperature and humidity." OSHA recommends temperature control in the range of 68-76° F and humidity control in the range of 20%-60%.

As a second source of guidance, American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 55, *Thermal Environmental Conditions for Human Occupancy*, addresses "thermal comfort" in an office environment, which means that an employee wearing a normal amount of clothing feels neither too cold nor too warm. This standard discusses thermal comfort within the context of air temperature, humidity, and air movement and provides recommended ranges for temperature and humidity that are intended to satisfy the majority of building occupants. These ranges vary for cold and hot weather. ASHRAE addresses ventilation and the removal of air contaminants in a separate standard, ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*.

Because there is no defined standard of what is good or bad, and using OSHA's acceptable ranges for temperature and humidity, we typically use 72 degrees and 40% humidity to equal a 100% Environmental Index. When the temperature and humidity move away from these values, the EI goes down.

Therefore, this report is showing a relative trend towards maintaining these values in the occupied period. It is expected that these values will drop off during unoccupied periods.



Environmental Index report

## Plant Efficiency Reports Feature

This feature provides real time reports and dashboards of key operating data including consumption and process data of central heating and cooling plants, compressed air systems, etc. This feature requires that the key Plant operating data points are logged in real-time. The Plant operating data is compared to year ago values for the periods of previous 7 days, previous 30 days, previous 365 days, week to date, month to date and year to date.

### Plant Efficiency Reports Feature - Analysis Option

This option provides monthly analysis of key Plant operating data. In addition to the reports, the Plant Efficiency Analysis option provides analysis and commentary for each data point including correlation, anomalies, and recommendations for conservation, cost reduction, and operation.

## Building Systems Analysis Feature

This feature provides a weekly analysis of building system operating conditions and includes a status report of identified issues, a prioritized list of recommendations, and a potential cost savings summary. Utility cost tracking is also included either via a real-time meter, or via utility billing.

## Building Systems Monitoring Feature

This feature provides weekly monitoring of building system alarms. Alarms are responded to based on an agreed upon response protocol. This feature includes 24/7 monitoring.

## Access System Management Feature

This feature provides remote administration of your card access system including the addition, deletion, and modification of system users. It also includes the administration of doors, groups, schedules, etc. System activity reports are posted on the customer's BPM account page on a monthly basis to show system activity that occurred during the prior month and for exception reports including invalid access attempts, doors held/forced open, etc..

You initiate a change request (add user, delete user, modify user, change schedules, groups, access levels, photo badging, etc.), using a system change request work order through your BPM account page. A system change conformation will be provided electronically confirming the action taken.

The screenshot displays a web-based form for requesting a new access control work order. The form is titled 'REQUEST NEW ACCESS CONTROL WORK ORDER - GATEWAY WEST SUSTAINABLE I'. It features a 'Request Type' dropdown menu set to 'Add Access User'. Below this, the 'USER ACCESS INFORMATION' section contains fields for 'Equipment' (set to 'COMMON TO OFFICE DOOR 01'), 'Full User Name: (Last, [M] First)', 'Activation Date/Time', 'Expiration Date/Time', 'Hot Stamp Card Number', 'Encoded Card Number', 'Card Format', and 'Access Level(s)'. The 'OPTIONAL USER INFORMATION' section includes fields for 'Photo ID', 'User Phone', 'User Email', 'User SMS Email', 'Vehicle Color', 'Vehicle Make', 'Vehicle Model', 'Vehicle License State', and 'Vehicle License Number'. The interface includes a navigation bar at the top with 'Welcome, thinkESIP' and 'Log Out', and a sidebar on the left with 'BUILDING PERFORMANCE MANAGER - BPM'. The ESI logo is visible in the bottom right corner.

### Access System Change Request

The screenshot displays a software interface with a dark theme. At the top, it shows 'ACCESS EQUIPMENT - GATEWAY WEST SUSTAINABLE 1' and 'Page 1 of 2'. Below this is a table with three columns: 'EQUIPMENT NAME', 'YTD COST', and 'LIFETIME COST'. The table lists various equipment names and their associated costs, all of which are \$0.00. At the bottom of this table is a 'Site Totals' row. Below the main table is a 'SITE REPORT' section with a similar table structure, showing 'SITE NAME', 'YTD COST', and 'LIFETIME COST' for 'Gateway Building' and 'Enterprise Totals', all with \$0.00 values. The ESI logo is visible in the bottom right corner of the interface.

EQUIPMENT NAME	YTD COST	LIFETIME COST
COMMON TO OFFICE DOOR 01	\$0.00	\$0.00
COMMON TO OFFICE DOOR 02	\$0.00	\$0.00
CUSTOMER SERVICE DOOR	\$0.00	\$0.00
ES TO TENTANT DOOR	\$0.00	\$0.00
EXPERIENCE ROOM DOOR	\$0.00	\$0.00
INNOVATION ROOM DOOR	\$0.00	\$0.00
LUNCH ROOM DOOR	\$0.00	\$0.00
MAIN ENTRANCE DOOR	\$0.00	\$0.00
SHIPPING MAN DOOR	\$0.00	\$0.00
SNC 1	\$0.00	\$0.00
Site Totals:	\$0.00	\$0.00

SITE NAME	YTD COST	LIFETIME COST
Gateway Building	\$0.00	\$0.00
Enterprise Totals:	\$0.00	\$0.00

### Access System Maintenance History