B3 Benchmarking WWTP Overview
March 8, 2017

Cheri Schneider
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Project Overview
History

• Established in 2004 for the State of Minnesota as part of Buildings, Benchmarks & Beyond (B3)

• Benchmarking now used by over 10,500 public and private buildings across the US. Focused currently in:
  • Minnesota
  • Iowa
  • East coast
B3 Benchmarking linkage to B3 Guidelines
History of WWTP Benchmarking

The State of MN wanted a way for municipalities to track energy savings potential of WWTPs alongside their other buildings. B3 Benchmarking uses simulation building modeling which is not applicable to industrial processes like WWTPs. An additional method to rank WWTPs needed to be developed based on key WWTP attributes.

ENERGY STAR Portfolio Manager provides a 1-100 percentile score for primary, secondary and advanced treatment plants with a design flow > 0.6 MGD (million gallons per day). B3 enhanced functionality to track required data for WWTPs and utilized existing ESPM integration to pull back a score similar to existing eligible buildings. For WWTPs smaller than 0.6 MGD, Benchmarking uses ESPM’s equation to calculate a score. Though not a precise percentile ranking, still a useful gauge of the plant’s energy performance.

This new functionality is only applicable for wastewater treatment plants and not lift stations, drinking water treatment plants or distribution utilities.

http://mn.b3benchmarking.com/WastewaterTreatmentPlants
Basic Navigation
Benchmarking Homepage

• Public Sections
  • Home
  • About
    • Webinars
    • Support Videos
  • News
  • Reports
    • Public summary of data

• Secure Section
  • Launch
    • Once signed in, button to launch application
Contact Us

Please select from the following options.

**General Inquiries**
For general comments, questions and support.

**Request Access**
Request access to the B3 Benchmarking application.

**Email**
Email us directly with your questions or comments.

**Phone**
Call us directly at 952-939-1878.

New Construction Questions? Contact B3 Guidelines at guidelines@b3mn.org

Need to request a new service provider user? Click here

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**Request Access**

Please fill out the form below to request an account access to the B3 Benchmarking system. If you are not a member of the organization you are requesting, access to or are requesting edit privileges, written permission from the organization's data owner will be required prior to access being granted. Required fields are indicated in red.

- **First Name:**
- **Last Name:**
- **Company:**
- **Title:**
- **Address:**
  - **City:**
  - **State:**
  - **Zip:**
- **Office Phone:**
- **Mobile:**
- **E-mail:**

Please provide a valid email address. A welcome email will be sent to this address as well as it being the account username.

**ACCESS REQUESTED**

- **Sector:**
- **Organization:**

If you don’t see your organization listed, please call us at 952-939-1878.

**Data Privileges:**

If access is needed to additional organizations, please provide sector, organization and data privileges in the comments field below.

**Comments:**

I would like to receive quarterly newsletter emails highlighting new features and functions of the B3 Benchmarking system

**Submit**
Managing “My Account”

My Account

Personal Information
First Name: Cheri
Last Name: Schneider
Company: The Weidt Group
Mailing Address: 5800 Baker Road
Minnetonka, MN 55345
Office Phone: 952-938-1588
Cell Phone: 
Fax: 
E-mail: cheri@weidt.com

Login Information
Username: E-mail: cheri@weidt.com
Password: *******************

Change Password  Sign Out

Email Alerts
✓ Configured to receive quarterly newsletter emails.
✓ Configured to receive seasonal improvement report emails.
NOT configured to receive aged meter reading alerts.

Manage My Alerts
Organization Level Energy Summary

Energy Mode – Green Background

Hierarchical tree:
- Organization
  - Site
    - Building

For help, click ? anywhere within application

Indicates how up-to-date meter data is
Organization Level Water Summary

Water Mode – Blue Background

Add new Buildings and Sites

Click column headers to re-sort

Water Mode is for tracking water a building/site uses not processes

Notes, Export, Import, Print and Help Buttons

Status informs you with warning and error triangles if you have missing or incorrect information.
Meter Search

The advanced meter search tool allows you to locate meters using a variety of search parameters. Enter in full or partial expressions into one or more fields below. The more fields you specify, the more refined the search results will be.

<table>
<thead>
<tr>
<th>Source</th>
<th>Utility Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Account Number</th>
<th>Meter Number</th>
<th>Purchase Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1507135</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Org/Site Name</th>
<th>Type</th>
<th>Utility Company</th>
<th>Account #</th>
<th>Meter #</th>
</tr>
</thead>
<tbody>
<tr>
<td>B3 Support Demo, Elementary School</td>
<td>Electric</td>
<td>Nxt Energy</td>
<td>51-5738908-5</td>
<td></td>
</tr>
<tr>
<td>B3 Support Demo, Elementary School</td>
<td>Natural Gas</td>
<td>Nxt Energy</td>
<td>51-5738908-5</td>
<td></td>
</tr>
</tbody>
</table>

Allows you to quickly find meters using a variety of full or partial search parameters.
Site Level Energy Summary

Site metrics summary - may be differences in ratings as metrics are measuring against different sources

Add new Buildings

Add new Meters
Building Level Energy Summary

Buildings can be decommissioned to retain historical data.

Meters can be disconnected if no longer in service.

Decommissioned buildings and disconnected meters can be hidden by unchecking.
Data Entry
Organization Editor

Organization address defaults to first building’s address. If organization has buildings across a large area, an alternate address (headquarters) can be specified for geo-location.
Site Editor

Not all tabs may be applicable

Attributes can associate organizations and sites with programs, departments, divisions, etc. Some attributes are view only and managed by administrators.

Remove warnings and errors by designating if no buildings, energy meters or water meters exist

Decommission an entire site
Attributes required to obtain ENERGY STAR Portfolio Manager (ESPM) score when applicable

Custom events to identify on Reports happenings that may impact consumption, process or costs
Site Decommissioning

Decommission Site

You are about to decommission this site. This will mark all buildings as decommissioned, and all meters as disconnected. A new building version named 'Site Decommissioned' will be created for each building using the last meter reading date. Each meter will be marked with a disconnection date equal to its last meter reading date. If necessary, decommissioned and disconnection dates can be edited in the building and meter editors, respectively.

To reverse this action, you will need to manually re-enable each building's decommissioned version in the building editor and clear the disconnected date for each meter in the meter editor.

Are you sure you want to proceed?
Site Decommissioning

Community Sports Center
500 First Avenue
Minnetonka, MN 55345

Building Versioning
If your building undergoes any sort of modification that may affect its performance (i.e., an addition, major renovation that changed space types, or substantial increase/decrease in hours of operation), you should create a new version of the building. Creating a new version allows the application to keep the historical data on how the building was operated and its related consumption. Click the 'Create a new building version' link to create a new version. You will be able to specify a version description and an effective date.

<table>
<thead>
<tr>
<th>Version #</th>
<th>Version Name</th>
<th>Effective Date</th>
<th>Square Footage</th>
<th>Active?</th>
<th>Delete?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>First Version</td>
<td>01/01/1995</td>
<td>112,509</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Site Decommissioned</td>
<td>11/05/2015</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ice Arena
Decommissioned 11/5/2015

Meters (2 meters)

<table>
<thead>
<tr>
<th>Meter Name</th>
<th>Status</th>
<th>Type</th>
<th>Utility</th>
<th>Meter #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elec - 000004799389 (Disconne.)</td>
<td></td>
<td>Electric Meter</td>
<td>Xcel Energy</td>
<td>1</td>
</tr>
<tr>
<td>Gas - 000600664725 (Disconne..)</td>
<td></td>
<td>Natural Gas Meter</td>
<td>Xcel Energy</td>
<td>1</td>
</tr>
</tbody>
</table>

Date Disconnected: 11/5/2015
Custom Event Type Examples

Renovation – equipment retrofit
- Minor renovations are events
- Major renovations should be a new building version (building sites)

Operation – change in processing

Maintenance – shutting down a boiler

Weather – storm knocked out power

Energy Fuel Sources (e.g. electric, natural gas) – broken meter

Water – water main break

Other
Add a New Site/Building

1. Complete
2. Incomplete
3. Decommissioned
4. Total

% Complete

Sites (14 of 16 sites are complete)

City Hall
Community Center
Demo WWTP
Dormitory
Elementary School
Fire Station
High School
Library
Multi-Family Housing
Park
Park Shelter (decommissioned)
Parking

Add a New Site/Building

Select the scenario that best describes what you'd like to do.

1. Create a new building and place it within a new site. The building does not share meters with any building structures already defined.
2. Add a building to an existing site. The building shares meters with other buildings on the site.
3. Create a new non-building site. Non-building sites are energy consumers like street lights, athletic fields, and lift stations that do not have any physical building structures.
4. Create a new wastewater treatment plant site. You will be required to define a plant flow meter and power meter.

Next Cancel
Sites vs. Buildings vs. Non-buildings

1-Building Site:
Building has its own meters
1 site = 1 building

Multi-Building Site:
Meter(s) shared by multiple buildings
1 site = multiple buildings

WWTP Site:
Wastewater treatment plants are flow normalized and do not have an engineering model thus considered a non-building site

Non-Building Site:
Energy and/or water consumers containing no building structures
Wastewater Treatment Plant Sites
Wastewater Treatment Plant (WWTP)
Non-Building Site

Even though WWTP often have physical buildings, B3 Benchmarking considers them “NON-BUILDING” sites.

Why...
• Energy use based on processed volume – not building size
• Metrics are flow normalized – not SF normalized
• No engineering building model within Benchmarking
  • No space allocations, hours of occupancy or building conditioning
• ENERGY STAR WWTP attributes managed in Site Editor
Wastewater Treatment Plant (WWTP)

Adding a new WWTP

1. Select WWTP option

2. Select respective energy sources for WWTP
Wastewater Treatment Plant (WWTP)
Adding a new WWTP

3. Enter site name, address and ID

4. Enter WWTP attributes – may use defaults

Enter WWTP permit number (e.g. MNxxxxxxx)

WWTP attributes will be imported quarterly linked by permit number on General tab.
Wastewater Treatment Plant (WWTP)

Adding a new WWTP

5. Enter at least 12 months of energy consumption

6. Enter 12 months of flow data

If there are no energy meters servicing your WWTP, please contact us to remove the electric meter.

Flow data will be imported quarterly linked by permit number in Site Editor.
Building Sites
Primary Building Type assigns default Space Allocation Types (SATs). SATs and operations can be customized to the building.
Building Editor
Advanced Benchmarking

Update one, some or all attributes to customize Advanced Benchmark

Basic Benchmark yellow

Advanced Benchmark orange
Advanced Benchmarking

General SAT Adjustments

Space Adjustments
- SAT arrangement
- # of floors by SAT
- # of units

Load Adjustments
- # of people by SAT
- Plug load
- Ventilation rate

Mechanical Adjustments
- Separate system and zone heating fuel types
- Humidity fuel source and setting
- Dehumidification setting

Specialty SAT Adjustments

Pools
- Pool water temperature
- Pool surface area
- Heating Source

Kitchens
- Meals per day
- # walk in coolers

Refrigerated Retail
- # of case doors
- # walk in coolers
Building Editor

Versions

Note:
Selecting Demolished or Sold will automatically update Version Name and Square Footage. Enter an Effective Date and disconnect any respective meters.

Step 1: Version Type

Step 2: Version Name and Effective Date
Building Editor

Versions (continued)

Modify prior versions by activating. Ensure applicable version number in upper corner. Save & Close will always revert to latest version.

Step 3:
Update Space Usage data as applicable

Step 4:
Save & Close
**Note:**
B3 metrics do not require this information and updating these fields has no impact on the calculations. This information is helpful to determine what types of energy improvement methods have been implemented in the past, if any, and what could be investigated in the future.
Meters
Add an Energy Meter
## Define meter information

- **Meter Name**: Elementary Electric Meter
- **Account #:** 51-5739908-5
- **Meter #:**
- **Date Connected**: (optional)
- **Date Disconnected**: (optional)
- **Utility Company**: Xcel Energy
- **Meter Services**: Floor area of building and parking area

## Enter Date Connected for new meters and Date Disconnected for meters no longer in service

Select Demand Columns to display Peak Demand and Demand Charge columns for data entry.

## Utilize $ per unit and consumption bar graph to validate entries

Click to add new row. Readings will be sorted chronologically when saved.
## Sample Utility Bill

### Electricity

#### ELECTRICITY SERVICE DETAILS

<table>
<thead>
<tr>
<th>PREMISES NUMBER:</th>
<th>303083480</th>
</tr>
</thead>
<tbody>
<tr>
<td>INVOICE NUMBER:</td>
<td>0490955064</td>
</tr>
</tbody>
</table>

#### METER READING INFORMATION

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>CURRENT READING</th>
<th>PREVIOUS READING</th>
<th>MEASURED USAGE</th>
<th>BILLED USAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured Readings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Energy</td>
<td>12910 Actual</td>
<td>12737 Actual</td>
<td>173</td>
<td>27680 kWh</td>
</tr>
<tr>
<td>Reactive Energy</td>
<td>6516 Actual</td>
<td>6436 Actual</td>
<td>80</td>
<td>12800 kVARh</td>
</tr>
<tr>
<td>Interval Usage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Energy</td>
<td>27625 Actual</td>
<td>Actual</td>
<td>27625</td>
<td>27625 kWh</td>
</tr>
<tr>
<td>Reactive Energy</td>
<td>12739 Actual</td>
<td>Actual</td>
<td>12739</td>
<td>12739 kVARh</td>
</tr>
<tr>
<td>Firm Demand</td>
<td>Actual</td>
<td>Actual</td>
<td>75 kW</td>
<td></td>
</tr>
<tr>
<td>Interrupt Demand</td>
<td>Actual</td>
<td>Actual</td>
<td>46 kW</td>
<td></td>
</tr>
<tr>
<td>Demand</td>
<td>Actual</td>
<td></td>
<td>121 kW</td>
<td></td>
</tr>
<tr>
<td>Billable Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power Factor Demand</td>
<td>90.81%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### ELECTRICITY CHARGES

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>USAGE UNITS</th>
<th>RATE</th>
<th>CHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Service Chg</td>
<td></td>
<td>$0.028310</td>
<td>$51.61</td>
</tr>
<tr>
<td>Energy Charge</td>
<td>27625 kWh</td>
<td>$0.028310</td>
<td>$782.06</td>
</tr>
<tr>
<td>Fuel Cost Charge</td>
<td>27625 kWh</td>
<td>$0.028833</td>
<td>$796.52</td>
</tr>
<tr>
<td>Firm Demand Summer</td>
<td>75 kW</td>
<td>$12.140000</td>
<td>$910.50</td>
</tr>
<tr>
<td>Controllable Demand</td>
<td>46 kW</td>
<td>$6.510000</td>
<td>$299.46</td>
</tr>
<tr>
<td>Affordability Chrg</td>
<td></td>
<td>$2.02</td>
<td></td>
</tr>
<tr>
<td>Resource Adjustment</td>
<td></td>
<td>$32.95</td>
<td></td>
</tr>
<tr>
<td>Interim Rate Adj</td>
<td></td>
<td>$282.23</td>
<td></td>
</tr>
</tbody>
</table>

**Subtotal** $3,217.35

**City Fees** 4.00% $128.69

**Total** $3,346.04

---

For Demand meters, enter actual not “Billable” demand.

Enter total charges after all taxes & fees.
Meter Editor

Natural Gas

Ensure each meter is defined for correct consumption units

Note: there are inconsistencies in the industry in using ‘k’ for thousand and ‘M’ or ‘MM’ for million

Start Date should match previous readings End Date

Select Transport Charge Columns to display Energy Charge and Transport Charge columns for data entry. The two charges will need to be added together to get the Total $
Sample Utility Bill
Natural Gas

Enter consumption after any factors or adjustments

Enter total charges after all taxes and fees
If your building contains a data center, ENERGY STAR requires sub-metering to be eligible for a score.

Define sub-meters to ensure consumption isn’t double counted

If applicable, specify what end uses sub-meter measures

Specify meter to which sub-meter is connected to
Specify building(s) meter services. Every meter must be connected to at least one building or flagged as servicing a non-building. This specification enables building level metrics.
Renewable Energy Meters

B3 currently does not have the capability to distinguish between energy produced and energy consumed. Meter data should be what the building used thus only positive values entered.

If owned, select ‘Owner’ as Utility. Contact support to add additional utility companies if necessary.

We are currently investigating additional renewable energy sources (e.g. methane) that may be utilized by WWTPs.

ENERGY STAR considers solar thermal an efficiency thus meter data will not be sent to ESPM.
Delivered Fuel Sources

Fuel oil, Propane & Wood

Two options to track consumption:

- ‘Stick’/measure tank on a regular basis and enter readings.
- Enter reading to cover period fuel source typically gets used (e.g. fuel oil tank is topped off in Oct and is only used during the heating season of Oct-Mar).

Readings with zero consumption keeps reports more accurate as to when fuel was actually used.
Add a Flow Meter to an existing WWTP site

Note: Flow Meter option only available within WWTP sites that do not already have one.
Flow Meter Editor

Quarterly the State will provide flow data which will be automatically imported into B3 Benchmarking.

Easily spot data entry errors. These will need to be corrected by re-submitting DMR records with corrected values.
Interval Energy Meters

B3 is able to automatically import interval readings from select vendors.
Add a Water Meter
Some utilities report water consumption in vague units. Where these have been identified, an icon will appear next to the Utility Company dropdown. Please let us know if you encounter unlisted conversions.
Sewer and storm water charges are not always based on water consumption thus separate meters have been developed for these.
Sample Utility Bill

Water

Reading Start and End dates

Usage and units

Include Sewer consumption and charges in separate meter

Enter total water charges including all taxes and fees BUT excluding any storm water or sewer charges
# Sample Utility Bill

## Water

<table>
<thead>
<tr>
<th>Type</th>
<th>Readings</th>
<th>Usage</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>WT</td>
<td>101</td>
<td>105</td>
<td>4</td>
</tr>
<tr>
<td>SW</td>
<td></td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>

- **Reading Start and End Dates**: January 15, 2013
- **Enter usage and total water usage charges after all taxes and fees**
- **Include sewer (SW) consumption and charges in separate meter**

---

**Due Date**: 02/04/2013

**Address**: 3300 1/2 Century Ave

**Account No.**: 9.026887.01

**Amount Due**: 44.62
Importing Consumption Data
Import Wizard

Import consumption data into Benchmarking via Excel spreadsheet

**Step 1: Generate template**

**Step 2: Download and open template**
Meter Data Spreadsheet Upload
(continued)

Step 3:
Enter new meter readings after existing readings. Existing gray reading dates are locked in template and cannot be modified. Existing black values are editable.

There is a tab for each meter.
Meter Data Spreadsheet Upload
(continued)

Step 4:
Import spreadsheet

Step 5:
Ensure completed template is closed. Browse to template.

Step 6:
Address any warnings and go back to step 5.
Meter Data Spreadsheet Upload (continued)

Step 7: Once validation passed or acceptable warnings, click Next.

Step 8: Import complete!
Data Integration
Xcel Energy Integration
https://mn.b3benchmarking.com/xcelenergy

Xcel Energy Automation
We have partnered with Xcel Energy to provide a secure method of automatically updating Xcel Energy consumption data directly into B3 Benchmarking. In this initial phase, only monthly consumption data is being provided. Cost and peak demand data will not be available. There is a one-time setup fee for this ongoing automatic meter data transfer based on number of meters being connected.

The base fee for monthly automated exchange from Xcel Energy is $1,000. That price includes the first 10 meters. Additional meters will be billed at the following tiered structure.

<table>
<thead>
<tr>
<th># of Add'l Meters</th>
<th>Add'l Fee/Meter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-25</td>
<td>$100</td>
</tr>
<tr>
<td>26-50</td>
<td>$75</td>
</tr>
<tr>
<td>51-75</td>
<td>$50</td>
</tr>
<tr>
<td>76+</td>
<td>$25</td>
</tr>
</tbody>
</table>

Example: An organization with 40 meters would pay $1,000 for the first 10 meters, $100/meter for the next 25 meters and $75/meter for the remaining 5 meters for a one-time fee of $3,875.

Check For Eligibility
ENERGY STAR Portfolio Manager Connection Wizard

Step 1: Contact Connection

Before ENERGY STAR data can be imported into B3, a contact connection must be made to the B3Benchmarking account. This connection only needs to be made once for all properties.

a. Click the Contacts link in the upper right corner to visit ‘My Contacts’

b. Click the ‘Add Contact’ button.

c. Search for username ‘B3Benchmarking’ and click the ‘Connect’ button.

Contact connection to the B3 Benchmarking account is complete. Click ‘Finish’.

Step 2: Sharing Properties

Share your property's building and meter data with B3 Benchmarking so that it can be imported. Follow this list of seven steps to successfully share. This operation only needs to be done once per property or meter.

a. Go to the Sharing tab and click the ‘Share (or Edit Access to) a Property’ button.

b. Select the properties you wish to share and specify ‘B3 Benchmarking’ as the account to share with.

Sharing is complete. Click ‘Next’ to continue.
ENERGY STAR Portfolio Manager Connection Wizard

(continued)

**Step 3: Property ID**

Enter the Portfolio Manager Property ID that you wish to connect with. The Property ID is a seven digit number indicated in the top left corner of the ‘My Portfolio’ tab.

Property Manager Property ID:

4614335

Click ‘Next’ to continue.

**Step 4: Meter Inventory**

Property ID #4614335 is associated with property *My High School*.

Specify the action you would you would like to perform for each meter:

- Connect to an existing B3 meter of the same type
- Create a new meter in B3
- Mark as disconnected to indicate no connection

<table>
<thead>
<tr>
<th>Meter Name</th>
<th>ID</th>
<th>Active</th>
<th>Supported</th>
<th>Type</th>
<th>Units</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Grid Meter</td>
<td>16499335</td>
<td>No</td>
<td>Yes</td>
<td>Electric</td>
<td>KilowattHours</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Electric Grid Meter</td>
<td>16499336</td>
<td>No</td>
<td>No</td>
<td>Electric</td>
<td>KilowattHours</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Electric Grid Meter</td>
<td>16499337</td>
<td>Yes</td>
<td>Yes</td>
<td>Electric</td>
<td>KilowattHours</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Electric Grid Meter</td>
<td>16499338</td>
<td>Yes</td>
<td>Yes</td>
<td>Electric</td>
<td>KilowattHours</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Fuel Oil (No. 1)</td>
<td>16499334</td>
<td>Yes</td>
<td>Yes</td>
<td>Fuel Oil</td>
<td>GallonsUS</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Natural Gas #1</td>
<td>16499332</td>
<td>Yes</td>
<td>Yes</td>
<td>Natural Gas</td>
<td>therms</td>
<td>Create meter in B3 Benchm</td>
</tr>
<tr>
<td>Natural Gas #2</td>
<td>16499333</td>
<td>Yes</td>
<td>Yes</td>
<td>Natural Gas</td>
<td>therms</td>
<td>Create meter in B3 Benchm</td>
</tr>
</tbody>
</table>

Click ‘Next’ to continue.
ENERGY STAR Portfolio Manager Connection Wizard
(continued)

**Step 5: Import Automation**
Specify the import action you would like to perform on each meter:

<table>
<thead>
<tr>
<th>DSM ID</th>
<th>B3 ID</th>
<th>Meter Name</th>
<th>Status</th>
<th>Type</th>
<th>Units</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1649325 New</td>
<td></td>
<td>Electric Grid Meter #1</td>
<td>Connected, create B3 meter</td>
<td>Electric</td>
<td>kW/hundredthousandkWhours</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649335 New</td>
<td></td>
<td>Electric Grid Meter #2</td>
<td>Connected, create B3 meter</td>
<td>Electric</td>
<td>kW/hundredthousandkWhours</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649336 New</td>
<td></td>
<td>Electric Grid Meter #3</td>
<td>Connected, create B3 meter</td>
<td>Electric</td>
<td>kW/hundredthousandkWhours</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649338 New</td>
<td></td>
<td>Electric Grid Meter #4</td>
<td>Connected, create B3 meter</td>
<td>Electric</td>
<td>kW/hundredthousandkWhours</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649334 New</td>
<td></td>
<td>Fuel Oil (No. 2)</td>
<td>Connected, create B3 meter</td>
<td>Fuel Oil No2</td>
<td>Gallons</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649332 New</td>
<td></td>
<td>Natural Gas #1</td>
<td>Connected, create B3 meter</td>
<td>Natural Gas</td>
<td>therms</td>
<td>Import now and every night</td>
</tr>
<tr>
<td>1649332 New</td>
<td></td>
<td>Natural Gas #2</td>
<td>Connected, create B3 meter</td>
<td>Natural Gas</td>
<td>therms</td>
<td>Import now and every night</td>
</tr>
</tbody>
</table>

Click ‘Next’ to continue.

**Actions:**
- Import now and every night
- Import now
- Do nothing

**Step 6: Preview ENERGY STAR Property**

**Meters**

- **Electric Grid Meter #1**
  - Electric - kWh/100,000 kWhours
  - Create new B3 Benchmarking Meter for ENERGY STAR meter # 1649325
  - Import meter data now and every night
  - 86 readings available.

- **Electric Grid Meter #2**
  - Electric - kWh/100,000 kWhours
  - Create new B3 Benchmarking Meter for ENERGY STAR meter # 1649326
  - Import meter data now and every night
  - 86 readings available.

- **Electric Grid Meter #3**
  - Electric - kWh/100,000 kWhours
  - Create new B3 Benchmarking Meter for ENERGY STAR meter # 1649327
  - Import meter data now and every night
  - 11 readings available.

New readings will be imported and existing readings will be updated in B3 Benchmarking. Click ‘Next’ to continue.
ENERGY STAR Portfolio Manager Connection Wizard (continued)

Step 7: Summary
The ENERGY STAR Portfolio Manager import tasks completed successfully.

B3 ENERGY STAR® Connection Wizard

B3 Benchmarking creates an ENERGY STAR® Portfolio Manager property for each B3 site and automatically transfers building and meter information after every edit for the purpose of gathering an ENERGY STAR score.
This site has received an ENERGY STAR score of 1.
Read about eligibility requirements.
Specify Additional ENERGY STAR Building Attributes.

Already Have An Account With ENERGY STAR?
If you already have an ENERGY STAR Portfolio Manager account with building and meter data you can connect to it and allow data to be imported into B3 either as a one-time operation or on an ongoing basis.

ENERGY STAR® Connection Wizard

<table>
<thead>
<tr>
<th>Energy Star Meter</th>
<th>Shared?</th>
<th>Linked?</th>
<th>Type</th>
<th>Import History?</th>
<th>EPM Meter ID</th>
<th>Last Import</th>
<th>First Reading</th>
<th>Last Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Grid Meter #3</td>
<td>Yes</td>
<td>Yes</td>
<td>Electric</td>
<td>Yes</td>
<td>16490037</td>
<td>12/9/2015</td>
<td>8/4/2014</td>
<td>9/16/2015</td>
</tr>
<tr>
<td>Electric Grid Meter #4</td>
<td>Yes</td>
<td>Yes</td>
<td>Electric</td>
<td>Yes</td>
<td>16490038</td>
<td>12/9/2015</td>
<td>8/13/2014</td>
<td>9/17/2015</td>
</tr>
<tr>
<td>Fuel Oil (No. 2)</td>
<td>Yes</td>
<td>Yes</td>
<td>Fuel Oil</td>
<td>Yes</td>
<td>16490034</td>
<td>12/9/2015</td>
<td>12/31/2006</td>
<td>4/23/2014</td>
</tr>
<tr>
<td>Natural Gas #1</td>
<td>Yes</td>
<td>Yes</td>
<td>Natural Gas</td>
<td>Yes</td>
<td>16490032</td>
<td>12/9/2015</td>
<td>5/24/2007</td>
<td>10/18/2015</td>
</tr>
<tr>
<td>Natural Gas #2</td>
<td>Yes</td>
<td>Yes</td>
<td>Natural Gas</td>
<td>Yes</td>
<td>16490033</td>
<td>12/9/2015</td>
<td>5/24/2007</td>
<td>9/17/2015</td>
</tr>
</tbody>
</table>
Meters created in Benchmarking by ENERGY STAR Portfolio Manager (ESPM) are missing data. For each new meter, complete the following data in the Meter Editor:

- Utility Name
- Account, Meter and/or Premise #s
- Date connected for newer meters
- Date disconnected for meters no longer in service
- Building connections
EnergyCAP Integration

In partnership with EnergyCAP, we have developed a custom import to facilitate the transfer of data from EnergyCAP into B3 Benchmarking. The account and meter numbers in both systems need to match identically. Export your data out of EnergyCAP using their standard **BL23A report** then import it into Benchmarking via the Import Wizard with no changes. No need to copy the data into Benchmarking’s standard import format. Note this transfer does **not** include peak demand data.
Dashboard Views
BENCHMARK (N/A for WWTP)
**Actual EUI**

Actual energy use of defined buildings based on entered meter consumption data

**Benchmark EUI**

Expected energy use of defined building(s) if built to ASHRAE/IESNA Standard 90.1-2010.

- Index Ratio = 1.0 is using exactly what energy code expects
- Index Ratio > 1.0 is using more energy than code expects
- Index Ratio < 1.0 is using less energy than code expects
High and low index ratios are red to highlight building and consumption data that may need to be validated for accuracy.
Potential savings are calculated for index ratios $\geq 0.85$. Savings dollars are calculated using actual site energy costs if available. If energy costs have not been entered, average state energy costs are used.
Organization Benchmark View – Natural Gas
Connections: specifies number of buildings each meter is connected to
Building Benchmark View – Electric
Building Benchmark View – Steam

NOTE: This building contains meters that are shared by other buildings. Shared buildings and meters are included in this report.
PEER COMPARISON
Peer Comparison View

Organization

Not all space type allocations have a large enough representation in the database to calculate a peer rating. “Non-Buildings” are N/A for a peer rating.

WWTP Peer Rating is based on ENERGY STAR score. Once at least 15 plants have energy data entered, peer ratings will be available.
Peer Comparison View

Compare by Space Allocation or Building Type and Distance

This site is ranked in the 89th percentile amongst 74 similar sites.

Compared to other sites comprised of similar space usage - 89% Dorm Rooms, 14% Common Areas, 5% Dining, etc.

Tolerance of space type percentages that qualify as a peer
ENERGY STAR View

Organization

Not all sites are eligible to receive a score.
ENERGY STAR View

Site

ENERGY STAR reasons for N/A status provided

ENERGY STAR connected meter
ENERGY STAR View

Site Attributes

ENERGY STAR attributes

* B3 uses defaults when applicable
* Not all attributes have defaults
ENERGY STAR View

WWTP

The State of MN provides the necessary ESPM attributes and monthly flow data. Once at least 12 months of energy data has been entered, a score will be displayed.

Plants designed > 0.6MDG

Scores come directly from ESPM and are noted with logo.

Plants designed < 0.6MDG

Scores calculated utilizing ESPM’s formula. Still useful however not a precise percentile ranking.
ENERGY STAR® is a national program designed to promote energy efficiency. EM Benchmark automatically creates an ENERGY STAR Portfolio Manager property for each site and transfers building and meter information for the purpose of gathering a score.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Status</th>
<th>Square Footage</th>
<th>83 Building Type</th>
<th>ENERGY STAR Building Type</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenwood WWTP</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>1</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>1</td>
</tr>
<tr>
<td>20246 Waste Water Treatment Plant</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>14</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>4</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>20</td>
</tr>
<tr>
<td>WWTP</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>22</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>40</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>70</td>
</tr>
<tr>
<td>WWTP</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>76</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>79</td>
</tr>
<tr>
<td>WWTP</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>80</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>80</td>
</tr>
<tr>
<td>Wastewater Treatment Plant</td>
<td>✔</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td>N/A</td>
</tr>
<tr>
<td>Altura WWTP</td>
<td>⚠</td>
<td></td>
<td>Waste Water Treatment Plant</td>
<td>Wastewater Treatment Plant</td>
<td></td>
</tr>
</tbody>
</table>
BASELINE
Organization Baseline View

Organization Wide Baseline Period

Baseline is used to compare a site to itself using a defined baseline period. The baseline is weather normalized so that changes in weather do not affect the comparison.

- Each site’s most recent period compared to Organization baseline period of Jan 2011 - Dec 2011 (Weather Normalized)

Sites as of 6/24/2013 are baseline-complete.
Organization Baseline View

Individual Site Baseline Periods
Site Baseline View

Adjust weather station and baseline period
### Weather Normalization

**Normalize Baseline:** adjust baseline period consumption to account for actual period’s weather

- **Actual Meter Total:** 162.74 kWh
- **Time Period:** Jul 2015 to Jun 2016
- **Baseline Period:** Jan 2010 - Dec 2010
- **Weather Station:** FLYING CLOUD AIRPORT

**Values:**
- **Actual:** 162.74 kWh
- **Baseline:** 288.49 kWh
- **Change:** -125.75 kWh
- **Percentage Change:** -43.59%

**Normalize Actual:** adjust actual period consumption to account for baseline period’s weather

- **Actual Meter Total:** 168.58 kWh
- **Time Period:** Jul 2015 to Jun 2016
- **Baseline Period:** Jan 2010 - Dec 2010
- **Weather Station:** FLYING CLOUD AIRPORT

**Values:**
- **Actual:** 168.58 kWh
- **Baseline:** 304.32 kWh
- **Change:** -135.74 kWh
- **Percentage Change:** -44.69%
Building Baseline View
Organization Baseline View

Baseline is used to compare a site to itself using a defined baseline period. The baseline is weather normalized so that changes in weather do not affect the comparison.

Sites at or above baseline are colored green.

- City Hall
- Multi-Family Housing
- Community Center
- Dormitory
- Elementary School
- Fire Station
- High School
- Library
- Parking
- Police Station
- Garage
- Office Station
- Public Works 1
- Warehouse
Site Baseline View

Adjust Time Period by clicking forward/back arrows
Baseline Period Editor

The Baseline Period Editor is used to specify a twelve month period to mark as a baseline to compare against. For best results, specify a baseline period with measured or estimated consumption data.

Available at the Organization level

For the most accurate metrics, pick a baseline with all meters reporting and 100% completeness
Reports – Organization
Reports – Site
Reports – Building
Reports – Report Options
Reports – Chart Types
Reports – Meters & Units

Report on meters of an energy source and select various metrics:
- kBtu
- Dollars
- CO2 Emissions
- Peak Demand
- Native Units
- Square Footage
Reports – Duration

Use dropdowns or arrows to move forward or backward in time.
Weather normalization is only available with Baseline comparison

Custom events

Mouse over graph to see detailed data points in legend
Reports – Comparison

None and Benchmark
Reports – Comparison
Baseline and Target
Consumption Summary will align with start duration
Normalize by flow
Reports – Interval Data

Interval reporting has different report options

If applicable, change meter source to Interval
Reports – Water

Water mode has many of the same report options as energy mode.
Tools
Improvements View

Click a Target to modify or add new Targets

List of potential programs to assist with energy improvements

Users with edit access may upload and view documents at Site level

Seasonal reports distributed when organization has potential for savings
Absolute Target

Step 1. General Info
Specify general info about the target you would like to identify.

Target Name:
[Input field]

Target Type
- Relative Target
- Absolute Target

A relative target allows you to track your performance against a percentage below a specified baseline period.
Example: I want to improve my energy consumption 10% by the year 2020, using 2015 as a baseline.

An absolute target lets you enter monthly energy consumption by fuel type meter. Example: I want to compare the actual consumption to a calculated or simulated expected consumption.

Purpose of Target (Optional)
- Decommissioning Improvement
- Energy Savings
- Improved Net Return
- High Level Improvement
- Other

Description (Optional)

Step 2. Energy Source Types
Specify the fuel sources and unit types you wish to target.

- Electric (kW)
- Electric (Gallons)
- Electric Peak Demand (kW)
- Electric Renewable (kWh)
- Electric Renewable (Dollars)
- Natural Gas (Therms)
- Natural Gas (Dollars)
- Steam/Hot Water (MMBTUs)
- Steam/Hot Water (Dollars)
- Chilled Water (TonHours)
- Chilled Water (Gallons)
- Propane (Gallons)
- Propane (Dollars)
- Fuel Oil (Gallons)
- Fuel Oil (Dollars)
- Wood (Ton)
- Wood (Dollars)

Step 3. Target Consumption
Enter the absolute target consumption you have calculated/simulated.

<table>
<thead>
<tr>
<th>Electric Energy</th>
<th>January</th>
<th>900</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>February</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td>March</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td>April</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>May</td>
<td>1100</td>
</tr>
<tr>
<td></td>
<td>June</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>July</td>
<td>1300</td>
</tr>
<tr>
<td></td>
<td>August</td>
<td>1300</td>
</tr>
<tr>
<td></td>
<td>September</td>
<td>1200</td>
</tr>
<tr>
<td></td>
<td>October</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>November</td>
<td>900</td>
</tr>
<tr>
<td></td>
<td>December</td>
<td>900</td>
</tr>
</tbody>
</table>

Step 4. Options
Specify the date you wish to achieve this target.

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Model:
- [Dropdown]

Target Applies To
- All Organizations

Q4, Q5 Support Demo

Cancel  << Prev  Next >>  Finish
Exporting

B3 allows you to export a variety of data into a single Microsoft Excel spreadsheet. Check the worksheets you'd like to include in your spreadsheet:

**Sites**
- Complete
- Incomplete
- Decommissioned

**Buildings & Meters**
- Buildings
- Building Space Usages
- Meters

**Consumption**

Export To Excel
Exporting Example

<table>
<thead>
<tr>
<th>Organization Name</th>
<th>Site Name</th>
<th>Current SF</th>
<th>Primary Space Usage</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>QA, B3 Support Demo</td>
<td>City Hall</td>
<td>8,671</td>
<td>City Hall</td>
<td>OK</td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Community Center</td>
<td>112,500</td>
<td>Ice Arena</td>
<td>OK</td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Elementary School</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Fire Station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Library</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Multi-Family Housing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Park</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Police Station</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Public Works 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QA, B3 Support Demo</td>
<td>Warehouse</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WWTP**

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Status</th>
<th>ENERGY STAR Score</th>
<th>Plant Type</th>
<th>Plant Design Flow Rate (MGD)</th>
<th>Average Influent BOD</th>
<th>Average Effluent BOD</th>
<th>Fixed Film Trickle</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWTP</td>
<td>✔</td>
<td>80</td>
<td>Aerated Pond</td>
<td>15.00</td>
<td>200</td>
<td>8</td>
<td>No</td>
</tr>
</tbody>
</table>
Mapping
Saving Charts – PNG or JPG
Help?

Summary Tab
Data at the Organization level is measured and reported on using a variety of metrics. Four predominant factors determine data quality for B3 Benchmarking.

- **Completeness**: Every site requires at least one complete building definition, one defined energy meter and 12 months’ worth of meter readings.
- **Correctness**: Building properties, consumption entries, and operational properties must fall within viable ranges.
- **Contiguous**: The minimum 12 months of consumption data must be contiguous.
- **Current**: The more recent the data, the better.

**Completeness Table**
The completeness of an organization is broken down by sites, square footage, buildings, and meters. Any incomplete site will have a red warning triangle in the status column of the sites list.

**Freshness**
The Freshness metric shows how current the oldest meter reading in the organization is. For example, if an organization has ten meters with meter readings current to 6/1/2015 and one meter with meter readings current to 2/1/2015, the Freshness metric will report that the data is current to 2/1/2015.

**Attributes**
The Attributes box displays characteristics of the Organization as well as programs, groups, divisions, and agencies to which the Organization belongs. Edit these attributes in the Organization Editor by clicking the notepad icon at the bottom right of the screen. Note: some attributes are only editable by administrators.
Warning & Error Messages

Within the app, mouse over icons to display warning or error

• **Yellow Warning Messages:**

  - Warning. Natural Gas meter 'NaturalGas 1' does not have a utility company specified.
  - Invalid space usage percentage in space type Fire Station.
  - Warning. Electric motor 'Heating' connect date is not the same as the motor's first reading start date.
  - Warning. Site 'City Hall' has meter readings prior to original occupancy date.
  - Warning. Natural Gas meter 'Fire 1' has gaps in meter readings.

• **Red Error Messages:**

  - Site 'Library' has incomplete data in the baseline year 2007.
  - Building 'Building 100' has an invalid zip code.
  - Building 'City Hall' space usages do not equal 100%.
  - Site 'City Hall' has no meters defined.
  - Site 'City Hall' has insufficient data to properly calculate a contiguous twelve month consumption period.
Thank You

Questions & Comments
Support@B3Benchmarking.com
952.939.1878