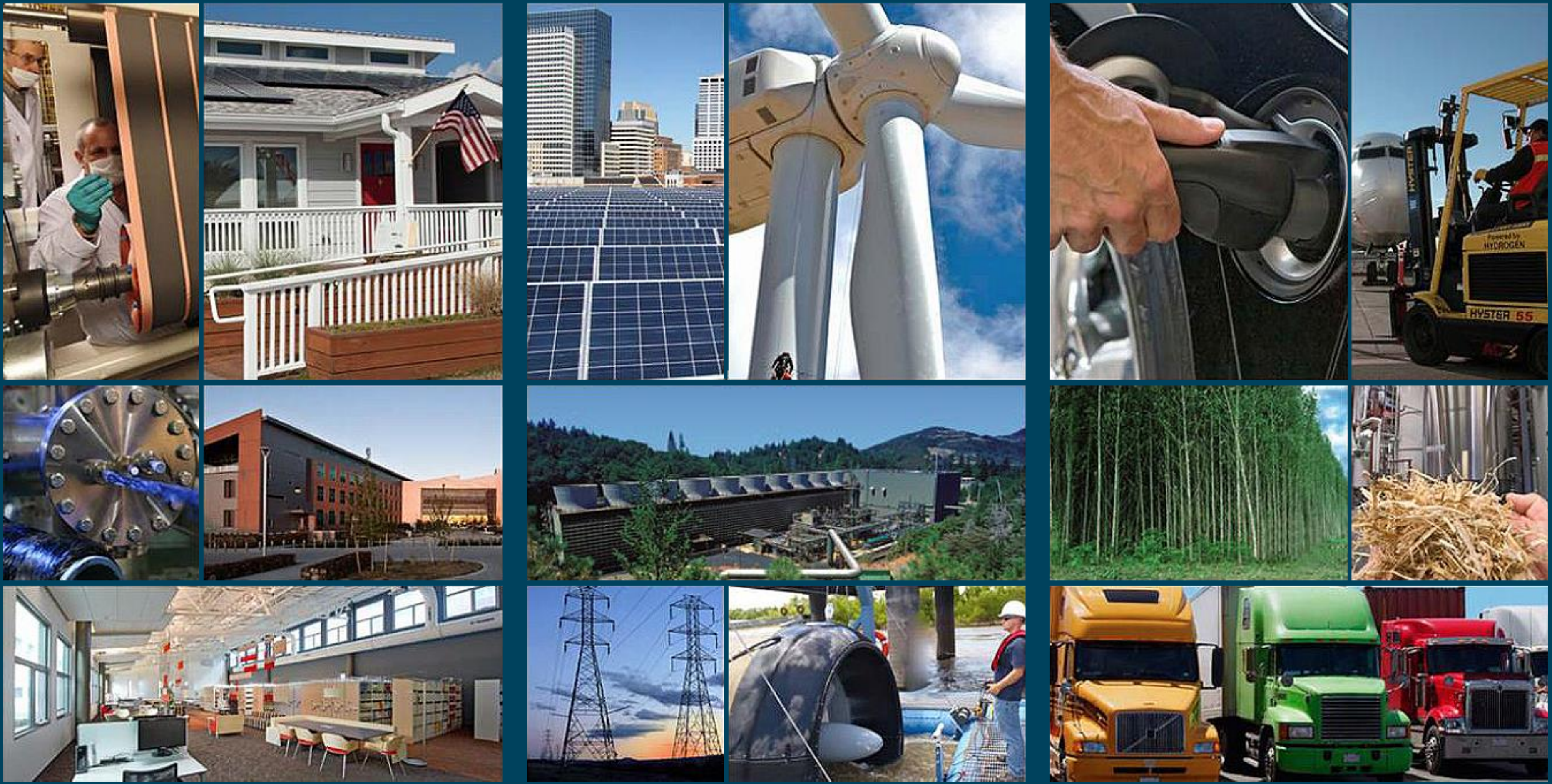
Energy Footprint Tool

Overview and Tour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U.S. DEPARTMENT OF
ENERGY

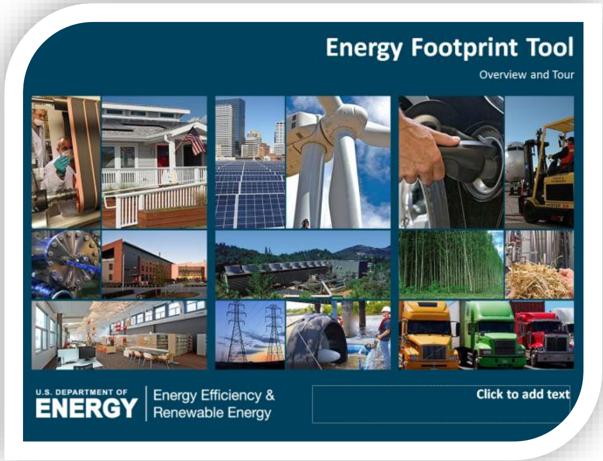
Energy Efficiency &
Renewable Energy

How to use this Document

This document is designed to be used as both a comprehensive presentation and a quick reference for the **Energy Footprint Tool**

To use as a quick reference:

- The table of contents provides links to all of the key topics covered.
- Each page also includes a direct link back to the table of contents



Energy Footprint Tool

Overview and Tour

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Click to add text

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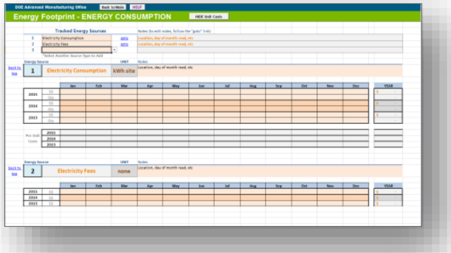
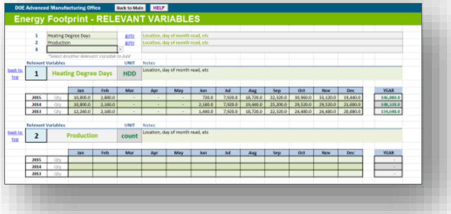
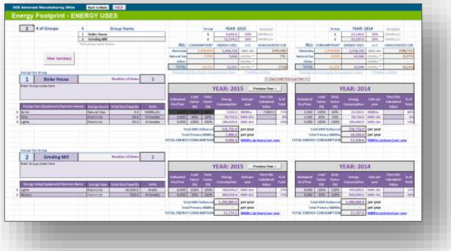
How to use the Energy Footprint Tool

The **Energy Footprint Tool** is designed to be easy to use with significant built-in documentation. Detailed labels and pop-up help windows on all sheets allow users quickly begin using all features.

What data needs to be gathered?


DOE Advanced Manufacturing Office
Energy Footprint - ENERGY CONSUMPTION


DOE Advanced Manufacturing Office
Energy Footprint - RELEVANT VARIABLES


DOE Advanced Manufacturing Office
Energy Footprint - ENERGY USES

Monthly Energy Bills should provide all of the required *Energy Consumption* data.

Depending on the *Relevant Variables*, these may or may not be tracked at the plant (ex. production, operating hours) and might need to be looked up (ex. degree days)

Energy Uses may or may not be individually tracked by the plant and could potentially be estimated based on energy consumption or possibly directly measured

Table of Contents (click links to jump to section)

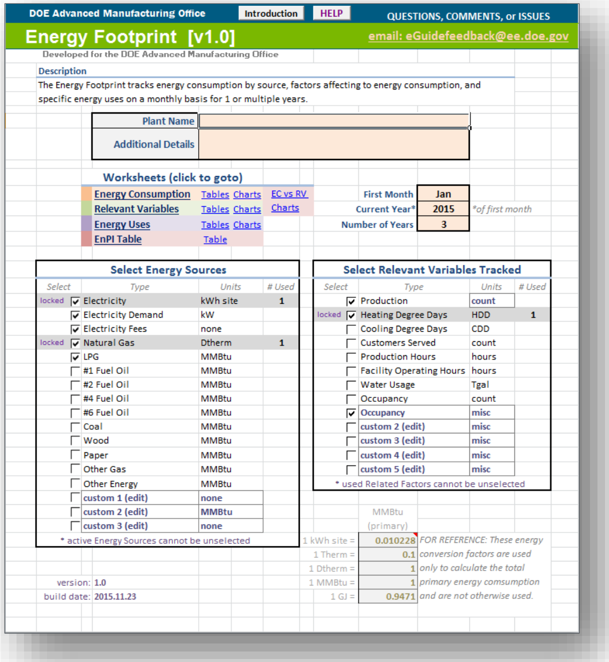
[Introduction to the Energy Footprint Tool]

[Summary of Key Sheets]

[Key Terms]

Spreadsheet Details [[description structure]]:

- **Main:** [Layout] [Notes]
- **Energy Consumption:** [Layout] [Notes]
- **EC Charts:** [Layout] [Notes]
- **Relevant Variables:** [Layout] [Notes]
- **RV Charts:** [Layout] [Notes]
- **EC-RV:** [Layout] [Notes]
- **Energy Uses:** [Layout] [Notes]
- **EU Charts:** [Layout] [Notes]
- **EnPI Table:** [Layout] [Notes]
- **Raw Data:** [Layout] [Notes]


DOE Advanced Manufacturing Office
Introduction
HELP
QUESTIONS, COMMENTS, or ISSUES

Energy Footprint [v1.0]

email: eGuidefeedback@ee.doe.gov

Developed for the DOE Advanced Manufacturing Office

Description

The Energy Footprint tracks energy consumption by source, factors affecting to energy consumption, and specific energy uses on a monthly basis for 1 or multiple years.

Plant Name	
Additional Details	

Worksheets (click to goto)

Energy Consumption	Tables	Charts	EC vs RV
Relevant Variables	Tables	Charts	Charts
Energy Uses	Tables	Charts	
EnPI Table	Table		

First Month: Jan
Current Year*: 2015 *of first month
Number of Years: 3

Select Energy Sources

Select		Type	Units	# Used
locked	☑	Electricity	kWh site	1
	☑	Electricity Demand	kW	
	☑	Electricity Fees	none	
locked	☑	Natural Gas	Dtherm	1
	☑	LPG	MMBtu	
	☐	#1 Fuel Oil	MMBtu	
	☐	#2 Fuel Oil	MMBtu	
	☐	#4 Fuel Oil	MMBtu	
	☐	#6 Fuel Oil	MMBtu	
	☐	Coal	MMBtu	
	☐	Wood	MMBtu	
	☐	Paper	MMBtu	
	☐	Other Gas	MMBtu	
	☐	Other Energy	MMBtu	
	☐	custom 1 (edit)	none	
	☐	custom 2 (edit)	MMBtu	
	☐	custom 3 (edit)	none	

* active Energy Sources cannot be unselected

Select Relevant Variables Tracked

Select		Type	Units	# Used
	☑	Production	count	
locked	☑	Heating Degree Days	HDD	1
	☐	Cooling Degree Days	CDD	
	☐	Customers Served	count	
	☐	Production Hours	hours	
	☐	Facility Operating Hours	hours	
	☐	Water Usage	Tgal	
	☐	Occupancy	count	
	☑	Occupancy	misc	
	☐	custom 2 (edit)	misc	
	☐	custom 3 (edit)	misc	
	☐	custom 4 (edit)	misc	
	☐	custom 5 (edit)	misc	

* used Related Factors cannot be unselected

	MMBtu (primary)
1 kWh site =	0.010228
1 Therm =	0.1
1 Dtherm =	1
1 MMBtu =	1
1 GJ =	0.9471

FOR REFERENCE: These energy conversion factors are used only to calculate the total primary energy comsumption and are not otherwise used.

version: 1.0
build date: 2015.11.23

Introduction

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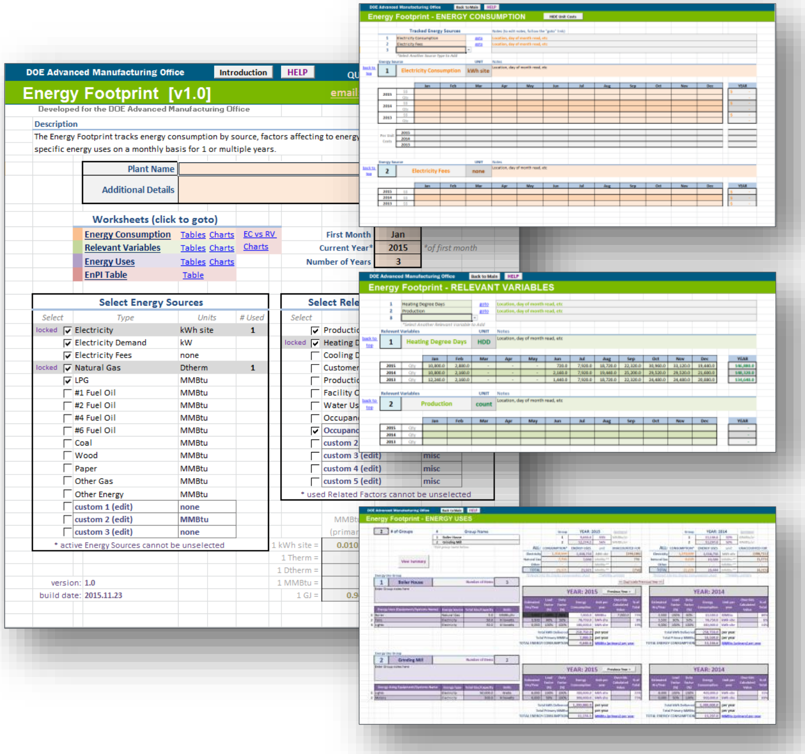
The **Energy Footprint Tool** is designed to allow users to easily track energy consumption, relevant variables, and energy uses.

Key tracking & features include:

- **Energy Consumption**
  - **Up to 20 Tracked Energy Sources**
- **Relevant Variables**
  - **Up to 20 Tracked Variables**
- **Energy Use**
  - **Up to 10 Energy Use Groups**
  - **Up to 30 Components Each**
- **Charts for all tracked data**
- **Export to the EnPI tool**



DOE Advanced Manufacturing Office
Introduction
HELP
email
Energy Footprint - ENERGY CONSUMPTION
Energy Footprint - RELEVANT VARIABLES
Heating Degree Days
HDD
Production
count
Energy Footprint - ENERGY USES
Boiler House
Grinding Mill

Energy Footprint [v1.0]

Developed for the DOE Advanced Manufacturing Office

Description

The Energy Footprint tracks energy consumption by source, factors affecting to energy specific energy uses on a monthly basis for 1 or multiple years.

Plant Name	
Additional Details	

Worksheets (click to goto)

Energy Consumption	Tables	Charts	EC vs RV Charts
Relevant Variables	Tables	Charts	
Energy Uses	Tables	Charts	
EnPI Table	Table		

First Month: Jan
Current Year*: 2015 *of first month
Number of Years: 3

Select Energy Sources

Select		Type	Units	# Used
locked	☑	Electricity	kWh site	1
	☑	Electricity Demand	kW	
	☑	Electricity Fees	none	
locked	☑	Natural Gas	Dtherm	1
	☑	LPG	MMBtu	
	☐	#1 Fuel Oil	MMBtu	
	☐	#2 Fuel Oil	MMBtu	
	☐	#4 Fuel Oil	MMBtu	
	☐	#6 Fuel Oil	MMBtu	
	☐	Coal	MMBtu	
	☐	Wood	MMBtu	
	☐	Paper	MMBtu	
	☐	Other Gas	MMBtu	
	☐	Other Energy	MMBtu	
	☐	custom 1 (edit)	none	
	☐	custom 2 (edit)	MMBtu	
	☐	custom 3 (edit)	none	

* active Energy Sources cannot be unselected

* used Related Factors cannot be unselected

version: 1.0
build date: 2015.11.23

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Summary of Key Sheets

Main – Overview of footprint tool with key settings

Energy Consumption – Monthly energy consumption and cost data

EC Charts – Energy consumption charts

Relevant Variables– Monthly and yearly data for relevant variables

RV Charts – Relevant variable charts

EC-RV – Charts comparing selected energy consumption with relevant variables

Energy Uses – Yearly energy uses tracked by group and specific use

EU Charts – Charts of energy uses

EnPI Table – Exportable data table compatible with EnPI analysis tool

Raw Data – All entered energy consumption and relevant variables data in one large table

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Key Terms

Energy Consumption

Defined as the “quantity of energy applied” (source ISO 50001:2011), it is the amount of energy consumed

Energy Source

The type of energy consumed: electricity, natural gas, fuel oil, etc. Electricity is broken into 3 components: electricity consumption, demand, and fees

Relevant Variables

Variables that likely contribute to energy consumption and use: production, operating hours, heating degree days, etc.

Energy Use

Defined as the “manner or kind of application of energy”, this often refers to energy use by specific equipment and applications

Load Factor

Average load relative to the full load of the equipment

Duty Factor

Average ratio of run time to operating hours

EnPI

Stands for *Energy Performance Indicator* and is defined as the “quantitative value or measure of energy performance” (source ISO 50001:2011)

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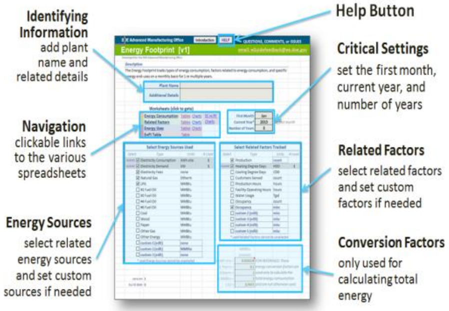
Structure of Sheet Descriptions

LAYOUT

Screenshot of the sheets provide details about the layout, highlighting key components

NOTES

List of functions, features, and tips related to the sheet



Identifying Information
add plant name and related details
Navigation
clickable links to the various spreadsheets
Energy Sources
select related energy sources and set custom sources if needed
Help Button
Critical Settings
set the first month, current year, and number of years
Related Factors
select related factors and set custom factors if needed
Conversion Factors
only used for calculating total energy

LAYOUT

NOTES

- To enter a new years worth of data, change the **Current Year** to the new year and increase the **Number of Years** by 1
- Selected **Energy Sources** and **Related Factors** cannot be changed after they have been directly connected with data and will be grayed out and tagged with the word *locked*.
- The *Introduction* popup can be stopped from automatically opening by checking the box in the lower left of the popup.
- The links to the **Energy Consumption** and **Related Factors** charts only appear if associated data has been entered.
- Changing **First Month** does not adjust entered data. If the **First Month** is changed after the data has been entered, the data will be aligned with different months.

Main sheet

LAYOUT

GO TO
Table of Contents

Identifying Information

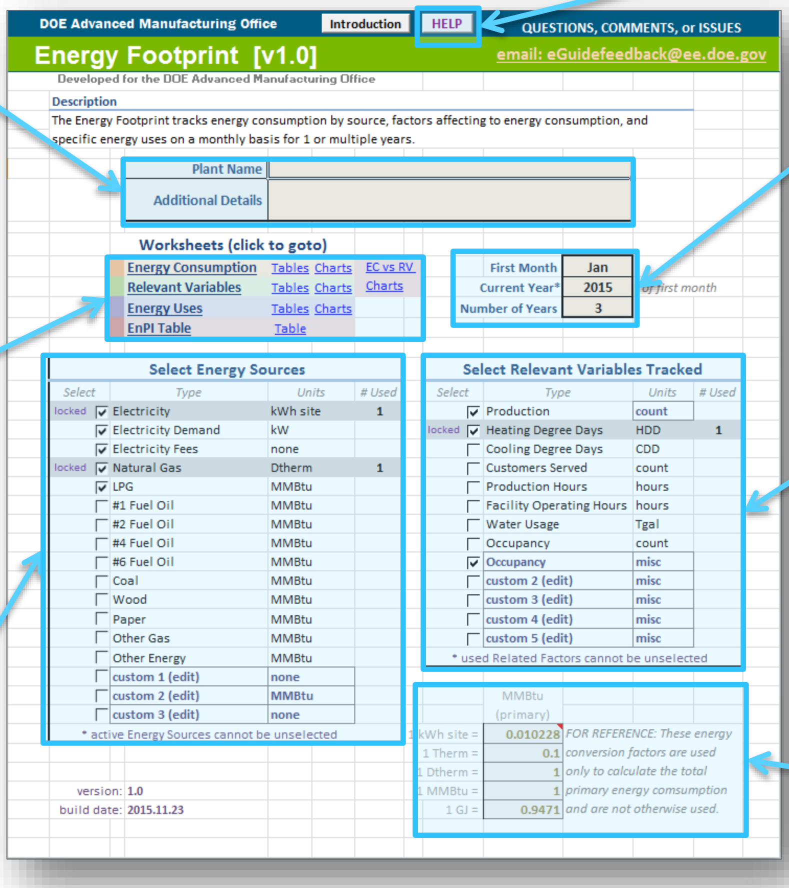
add plant name and related details

Navigation

clickable links to the various spreadsheets

Energy Sources

select related energy sources and set custom sources if needed



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Energy Footprint [v1.0]

email: eGuidefeedback@ee.doe.gov

Developed for the DOE Advanced Manufacturing Office

Description

The Energy Footprint tracks energy consumption by source, factors affecting to energy consumption, and specific energy uses on a monthly basis for 1 or multiple years.

Plant Name	
Additional Details	

Worksheets (click to goto)

Energy Consumption	Tables	Charts	EC vs RV
Relevant Variables	Tables	Charts	Charts
Energy Uses	Tables	Charts	
EnPI Table	Table		

First Month	Jan
Current Year*	2015
Number of Years	3

of first month

Select Energy Sources

Select		Type	Units	# Used
locked	☑	Electricity	kWh site	1
	☑	Electricity Demand	kW	
	☑	Electricity Fees	none	
locked	☑	Natural Gas	Dtherm	1
	☑	LPG	MMBtu	
	☐	#1 Fuel Oil	MMBtu	
	☐	#2 Fuel Oil	MMBtu	
	☐	#4 Fuel Oil	MMBtu	
	☐	#6 Fuel Oil	MMBtu	
	☐	Coal	MMBtu	
	☐	Wood	MMBtu	
	☐	Paper	MMBtu	
	☐	Other Gas	MMBtu	
	☐	Other Energy	MMBtu	
	☐	custom 1 (edit)	none	
	☐	custom 2 (edit)	MMBtu	
	☐	custom 3 (edit)	none	

* active Energy Sources cannot be unselected

Select Relevant Variables Tracked

Select		Type	Units	# Used
	☑	Production	count	
locked	☑	Heating Degree Days	HDD	1
	☐	Cooling Degree Days	CDD	
	☐	Customers Served	count	
	☐	Production Hours	hours	
	☐	Facility Operating Hours	hours	
	☐	Water Usage	Tgal	
	☐	Occupancy	count	
	☑	Occupancy	misc	
	☐	custom 2 (edit)	misc	
	☐	custom 3 (edit)	misc	
	☐	custom 4 (edit)	misc	
	☐	custom 5 (edit)	misc	

* used Related Factors cannot be unselected

	MMBtu (primary)	
1 kWh site =	0.010228	FOR REFERENCE: These energy
1 Therm =	0.1	conversion factors are used
1 Dtherm =	1	only to calculate the total
1 MMBtu =	1	primary energy comsumption
1 GJ =	0.9471	and are not otherwise used.

version: 1.0
build date: 2015.11.23

Help Button

Critical Settings

set the first month, current year, and number of years

Relevant Variables

select relevant variables and set custom variables if needed

Conversion Factors

only used for calculating total energy consumption and by energy use

Main sheet

NOTES

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- To enter a new years worth of data, change the **Current Year** to the new year and increase the **Number of Years** by 1
- Selected **Energy Sources** and **Relevant Variables** cannot be changed after they have been directly connected with data and will be grayed out and tagged with the word *locked.*
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- Changing the **First Month** does not adjust entered data. If the **First Month** is changed after the data has been entered, the data will be aligned with different months.

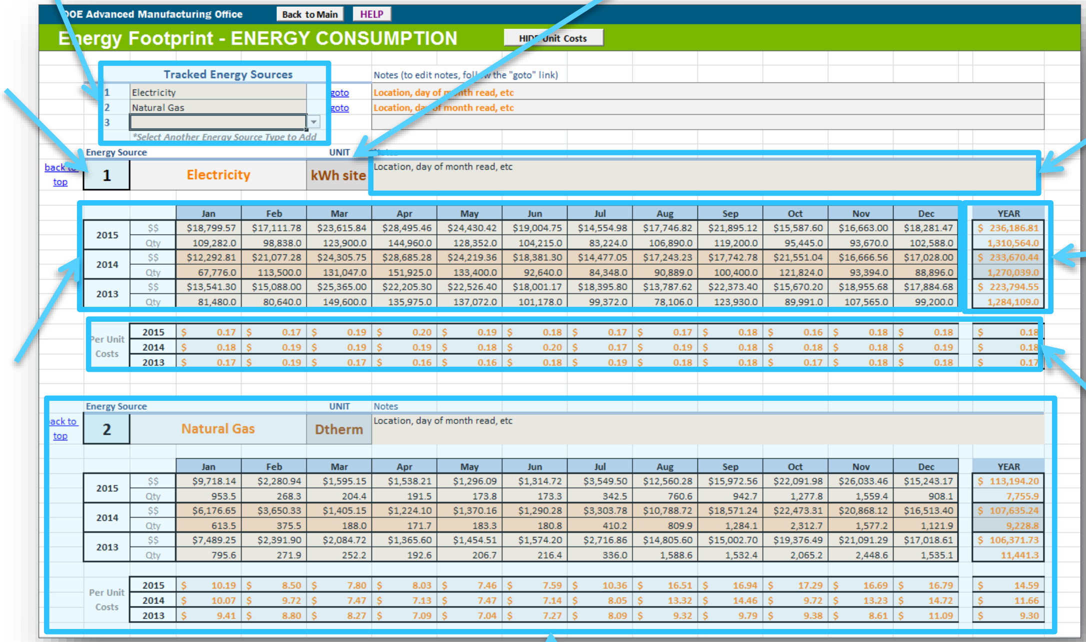
Energy Consumption sheet

Tracked Energy Sources
includes only selected
Energy Source types

Energy Source Units
pulled from Main sheet

Energy Sources #
the ID number for
the specific energy
source data

Energy Source Notes
Can include details
like meter location,
utility, building, etc



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Back to Main
HELP
Energy Footprint - ENERGY CONSUMPTION
HIDE Unit Costs

Tracked Energy Sources

			Notes (to edit notes, follow the "goto" link)
1	Electricity	goto	Location, day of month read, etc
2	Natural Gas	goto	Location, day of month read, etc
3			

*Select Another Energy Source Type to Add

	Energy Source		UNIT	Notes
back to top	1	Electricity	kWh site	Location, day of month read, etc

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YEAR
2015	$$	$18,799.57	$17,111.78	$23,615.84	$28,495.46	$24,430.42	$19,004.75	$14,554.98	$17,746.82	$21,895.12	$15,587.60	$16,663.00	$18,281.47	$ 236,186.81
	Qty	109,282.0	98,838.0	123,900.0	144,960.0	128,352.0	104,215.0	83,224.0	106,890.0	119,200.0	95,445.0	93,670.0	102,588.0	1,310,564.0
2014	$$	$12,292.81	$21,077.28	$24,305.75	$28,685.28	$24,219.36	$18,381.30	$14,477.05	$17,243.23	$17,742.78	$21,551.04	$16,666.56	$17,028.00	$ 233,670.44
	Qty	67,776.0	113,500.0	131,047.0	151,925.0	133,400.0	92,640.0	84,348.0	90,889.0	100,400.0	121,824.0	93,394.0	88,896.0	1,270,039.0
2013	$$	$13,541.30	$15,088.00	$25,365.00	$22,205.30	$22,526.40	$18,001.17	$18,395.80	$13,787.62	$22,373.40	$15,670.20	$18,955.68	$17,884.68	$ 223,794.55
	Qty	81,480.0	80,640.0	149,600.0	135,975.0	137,072.0	101,178.0	99,372.0	78,106.0	123,930.0	89,991.0	107,565.0	99,200.0	1,284,109.0

Per Unit Costs	2015	$ 0.17	$ 0.17	$ 0.19	$ 0.20	$ 0.19	$ 0.18	$ 0.17	$ 0.17	$ 0.18	$ 0.16	$ 0.18	$ 0.18	$ 0.18
	2014	$ 0.18	$ 0.19	$ 0.19	$ 0.19	$ 0.18	$ 0.20	$ 0.17	$ 0.19	$ 0.18	$ 0.18	$ 0.18	$ 0.19	$ 0.18
	2013	$ 0.17	$ 0.19	$ 0.17	$ 0.16	$ 0.16	$ 0.18	$ 0.19	$ 0.18	$ 0.18	$ 0.17	$ 0.18	$ 0.18	$ 0.17

	Energy Source		UNIT	Notes
back to top	2	Natural Gas	Dtherm	Location, day of month read, etc

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YEAR
2015	$$	$9,718.14	$2,280.94	$1,595.15	$1,538.21	$1,296.09	$1,314.72	$3,549.50	$12,560.28	$15,972.56	$22,091.98	$26,033.46	$15,243.17	$ 113,194.20
	Qty	953.5	268.3	204.4	191.5	173.8	173.3	342.5	760.6	942.7	1,277.8	1,559.4	908.1	7,755.9
2014	$$	$6,176.65	$3,650.33	$1,405.15	$1,224.10	$1,370.16	$1,290.28	$3,303.78	$10,788.72	$18,571.24	$22,473.31	$20,868.12	$16,513.40	$ 107,635.24
	Qty	613.5	375.5	188.0	171.7	183.3	180.8	410.2	809.9	1,284.1	2,312.7	1,577.2	1,121.9	9,228.8
2013	$$	$7,489.25	$2,391.90	$2,084.72	$1,365.60	$1,454.51	$1,574.20	$2,716.86	$14,805.60	$15,002.70	$19,376.49	$21,091.29	$17,018.61	$ 106,371.73
	Qty	795.6	271.9	252.2	192.6	206.7	216.4	336.0	1,588.6	1,532.4	2,065.2	2,448.6	1,535.1	11,441.3

Per Unit Costs	2015	$ 10.19	$ 8.50	$ 7.80	$ 8.03	$ 7.46	$ 7.59	$ 10.36	$ 16.51	$ 16.94	$ 17.29	$ 16.69	$ 16.79	$ 14.59
	2014	$ 10.07	$ 9.72	$ 7.47	$ 7.13	$ 7.47	$ 7.14	$ 8.05	$ 13.32	$ 14.46	$ 9.72	$ 13.23	$ 14.72	$ 11.66
	2013	$ 9.41	$ 8.80	$ 8.27	$ 7.09	$ 7.04	$ 7.27	$ 8.09	$ 9.32	$ 9.79	$ 9.38	$ 8.61	$ 11.09	$ 9.30

Yearly Totals

Energy Source Cost and Unit Data
entered by
year and month

Unit Costs
can be hidden
or displayed as
needed

Energy Source Format Repeats
unit fields are hidden for unit-less
energy sources

Energy Consumption sheet

NOTES

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- Up to 20 **Energy Sources** can be tracked
- Units fields only appear for **Energy Sources** that include units. For example, *Electricity Fees* do not include units
- To add a new **Tracked Energy Source**, select it from the dropdown menu in the blank space
- Only the last **Tracked Energy Source** can be removed. This can be done by deleting the **Energy Source** from the list.
- To add an **Energy Source** to the dropdown menu, go to the ***Main*** sheet and select the additional **Energy Source**
- *Unit Costs* can be used to quickly identify data errors
- Even when rows are hidden, the data is not deleted or overwritten

EC Charts sheet

LAYOUT

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Selected Energy Source

Charts display selected energy source

Energy Source Notes

Notes pulled from Energy Consumption sheet

Monthly Data Charts

Displays monthly costs and energy consumption for each tracked year

Related Data Tables

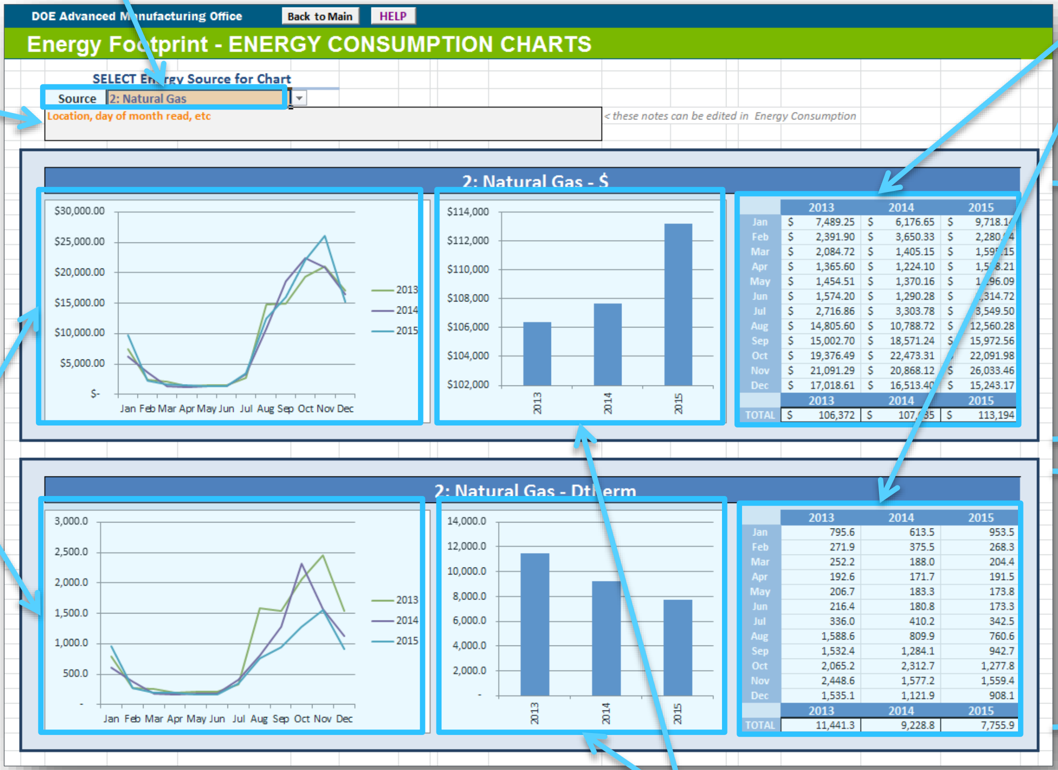
Tables of charted data

Cost Related

Charts and tables

Energy Consumption Related

Charts and tables. Hidden if unit-less energy source selected


DOE Advanced Manufacturing Office
Back to Main
HELP
$30,000.00
$25,000.00
$20,000.00
$15,000.00
$10,000.00
$5,000.00
$-
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2013
2014
2015
$114,000
$112,000
$110,000
$108,000
$106,000
$104,000
$102,000
2013
2014
2015
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
-
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2013
2014
2015
14,000.0
12,000.0
10,000.0
8,000.0
6,000.0
4,000.0
2,000.0
-
2013
2014
2015

Energy Footprint - ENERGY CONSUMPTION CHARTS

SELECT Energy Source for Chart

Source: 2: Natural Gas

Location, day of month read, etc

< these notes can be edited in Energy Consumption

2: Natural Gas - $

	2013	2014	2015
Jan	$ 7,489.25	$ 6,176.65	$ 9,718.1[illegible]
Feb	$ 2,391.90	$ 3,650.33	$ 2,280.[illegible]4
Mar	$ 2,084.72	$ 1,405.15	$ 1,59[illegible].15
Apr	$ 1,365.60	$ 1,224.10	$ 1,5[illegible]8.21
May	$ 1,454.51	$ 1,370.16	$ 1,[illegible]96.09
Jun	$ 1,574.20	$ 1,290.28	$ [illegible],314.72
Jul	$ 2,716.86	$ 3,303.78	$ 3,549.50
Aug	$ 14,805.60	$ 10,788.72	$ 12,560.28
Sep	$ 15,002.70	$ 18,571.24	$ 15,972.56
Oct	$ 19,376.49	$ 22,473.31	$ 22,091.98
Nov	$ 21,091.29	$ 20,868.12	$ 26,033.46
Dec	$ 17,018.61	$ 16,513.40	$ 15,243.17
	2013	2014	2015
TOTAL	$ 106,372	$ 107,[illegible]35	$ 113,194

2: Natural Gas - Dtherm

	2013	2014	2015
Jan	795.6	613.5	953.5
Feb	271.9	375.5	268.3
Mar	252.2	188.0	204.4
Apr	192.6	171.7	191.5
May	206.7	183.3	173.8
Jun	216.4	180.8	173.3
Jul	336.0	410.2	342.5
Aug	1,588.6	809.9	760.6
Sep	1,532.4	1,284.1	942.7
Oct	2,065.2	2,312.7	1,277.8
Nov	2,448.6	1,577.2	1,559.4
Dec	1,535.1	1,121.9	908.1
	2013	2014	2015
TOTAL	11,441.3	9,228.8	7,755.9

Yearly Data Charts

Displays total yearly costs and energy consumption

EC Charts sheet

NOTES

- The ***EC Charts*** sheet will be hidden until **Tracked Energy Sources** are added to the ***Energy Consumption*** sheet
- Change the selected **Energy Source** to change the charts
- The notes associated with the **Energy Source** will also be displayed
- Additional aggregate Energy Consumption data can be charted if applicable including; *Total Electricity*, *Total Natural Gas*, *Total Other*, and overall *Total Energy*
- The usage charts will be hidden if the selected **Energy Source** is unit-less
- Changing the selected **Energy Source** will also update the selected **Energy Source** on the ***EC-RV*** sheet

Relevant Variables sheet

LAYOUT

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Tracked Relevant Variables
includes only selected Relevant Variable types

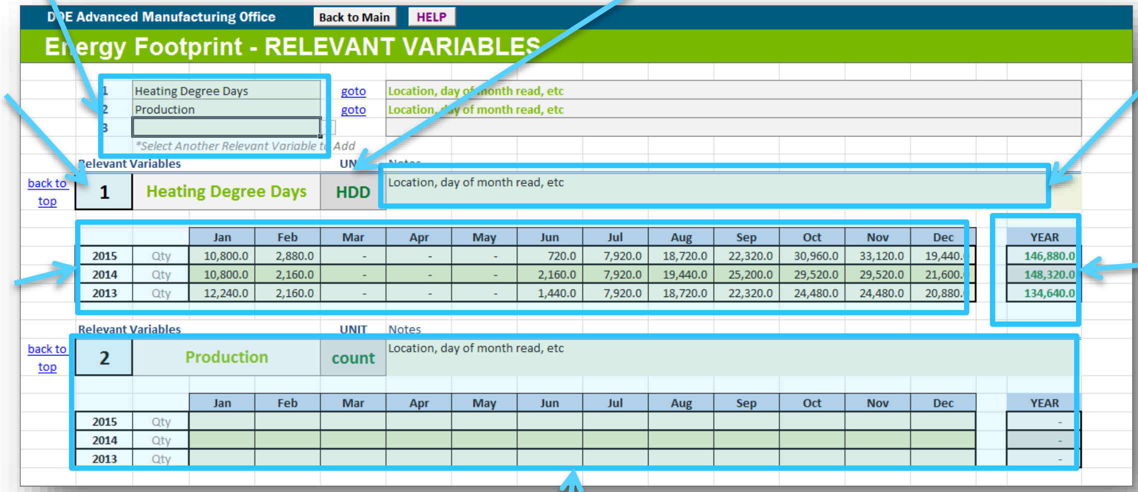
Relevant Variables Units
pulled from Main sheet

Relevant Variables Notes
Can include details like building, tracking method, source, etc

Relevant Variables #
ID number of the tracked sources

Relevant Variables Data
entered by year and month

Yearly Totals



DOE Advanced Manufacturing Office

Energy Footprint - RELEVANT VARIABLES

1	Heating Degree Days	goto	Location, day of month read, etc
2	Production	goto	Location, day of month read, etc
3			

*Select Another Relevant Variable to Add

Relevant Variables | UNIT | Notes

1 | Heating Degree Days | HDD | Location, day of month read, etc

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YEAR
2015	Qty	10,800.0	2,880.0	-	-	-	720.0	7,920.0	18,720.0	22,320.0	30,960.0	33,120.0	19,440.	146,880.0
2014	Qty	10,800.0	2,160.0	-	-	-	2,160.0	7,920.0	19,440.0	25,200.0	29,520.0	29,520.0	21,600.	148,320.0
2013	Qty	12,240.0	2,160.0	-	-	-	1,440.0	7,920.0	18,720.0	22,320.0	24,480.0	24,480.0	20,880.	134,640.0

Relevant Variables | UNIT | Notes

2 | Production | count | Location, day of month read, etc

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YEAR
2015	Qty													-
2014	Qty													-
2013	Qty													-

Relevant Variables Format Repeats

Relevant Variables sheet

- Up to 20 **Relevant Variables** can be tracked
- To add a new **Relevant Variables**, select it from the dropdown menu in the blank space
- Only the last **Relevant Variables** can be removed by deleting the Energy Source from the list
- To add a **Relevant Variables** to the dropdown menu, go to the ***Main*** sheet and select the additional **Relevant Variables**
- Even when rows are hidden, the data is not deleted or overwritten

RV Charts sheet

LAYOUT

GO TO
Table of Contents

Selected Relevant Variable

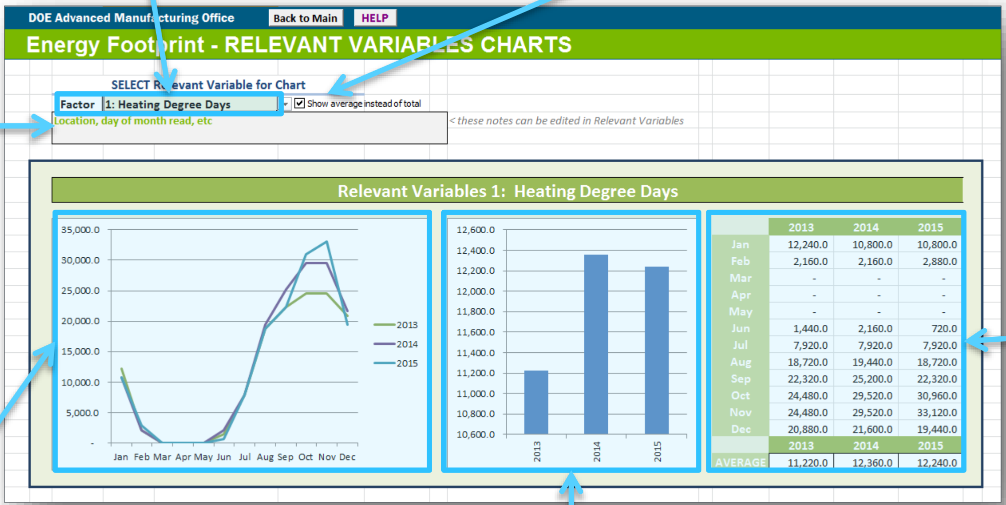
Charts displayed selected relevant variable

Total or Average

Checkbox toggles between displaying yearly average and total

Relevant Variable Notes

Notes pulled from Relevant Variables sheet



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Back to Main
HELP

Energy Footprint - RELEVANT VARIABLES CHARTS

SELECT Relevant Variable for Chart

Factor: 1: Heating Degree Days

☑ Show average instead of total

Location, day of month read, etc

< these notes can be edited in Relevant Variables

Relevant Variables 1: Heating Degree Days

35,000.0
30,000.0
25,000.0
20,000.0
15,000.0
10,000.0
5,000.0
-
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
2013
2014
2015
12,600.0
12,400.0
12,200.0
12,000.0
11,800.0
11,600.0
11,400.0
11,200.0
11,000.0
10,800.0
10,600.0
2013
2014
2015

	2013	2014	2015
Jan	12,240.0	10,800.0	10,800.0
Feb	2,160.0	2,160.0	2,880.0
Mar	-	-	-
Apr	-	-	-
May	-	-	-
Jun	1,440.0	2,160.0	720.0
Jul	7,920.0	7,920.0	7,920.0
Aug	18,720.0	19,440.0	18,720.0
Sep	22,320.0	25,200.0	22,320.0
Oct	24,480.0	29,520.0	30,960.0
Nov	24,480.0	29,520.0	33,120.0
Dec	20,880.0	21,600.0	19,440.0
	2013	2014	2015
AVERAGE	11,220.0	12,360.0	12,240.0

Monthly Data Chart

Displays monthly costs and usage for each tracked year

Related Data Tables

Table of charted data

Yearly Data Charts

Displays yearly total or average for Relevant Variable

RV Charts sheet

- The ***RV Charts*** sheet will be hidden until **Tracked Relevant Variables** are added to the ***Relevant Variables*** sheet
- Change the selected **Relevant Variables** to change the charts
- The notes associated with the **Relevant Variables** will also be displayed
- Changing the selected **Relevant Variable** will also update the selected **Relevant Variable** on the ***EC-RV*** sheet
- The *Show average instead of total* checkbox will change the yearly total to yearly average to better represent **Relevant Variables** that are not cumulative

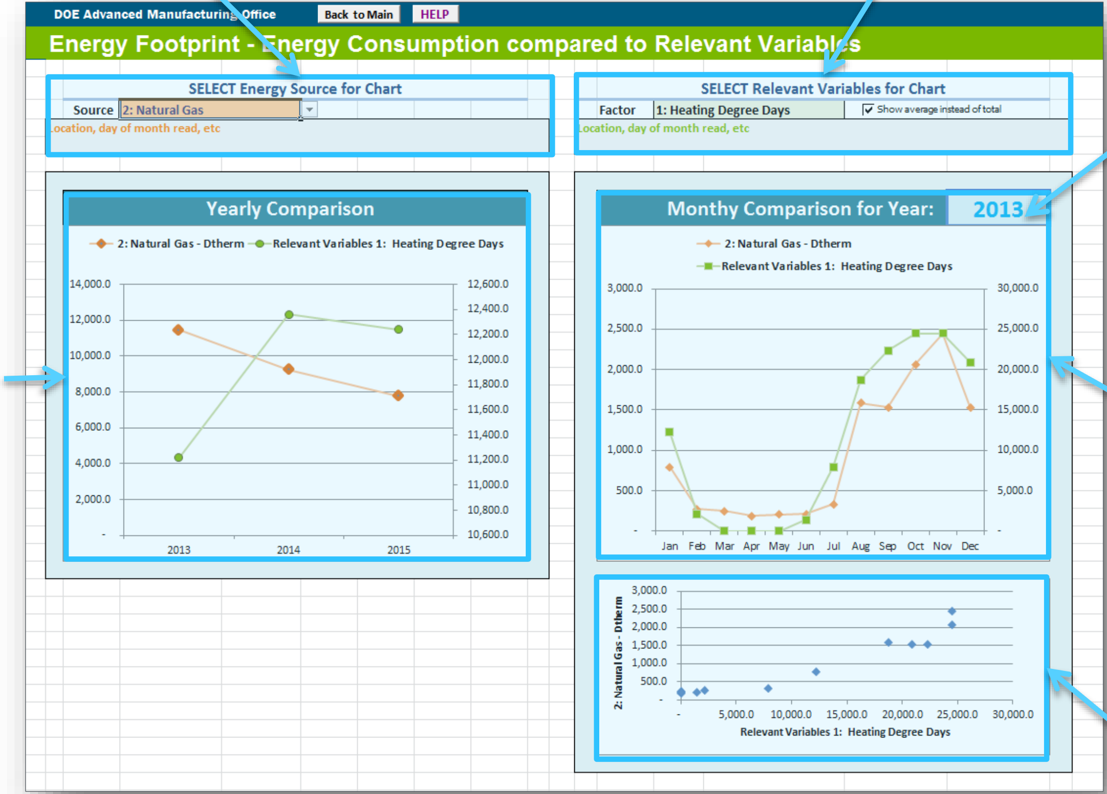
EC-RV sheet

LAYOUT

GO TO
Table of Contents

Selected Energy Source
Charts display selected energy source

Selected Relevant Variable
Charts display selected Relevant Variable



DOE Advanced Manufacturing Office

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HELP

Energy Footprint - Energy Consumption compared to Relevant Variables

SELECT Energy Source for Chart

Source: 2: Natural Gas

Location, day of month read, etc

SELECT Relevant Variables for Chart

Factor: 1: Heating Degree Days

☑ Show average instead of total

Location, day of month read, etc

Yearly Comparison
2: Natural Gas - Dtherm
Relevant Variables 1: Heating Degree Days
14,000.0
12,000.0
10,000.0
8,000.0
6,000.0
4,000.0
2,000.0
-
12,600.0
12,400.0
12,200.0
12,000.0
11,800.0
11,600.0
11,400.0
11,200.0
11,000.0
10,800.0
10,600.0
2013
2014
2015
Monthy Comparison for Year:
2013
2: Natural Gas - Dtherm
Relevant Variables 1: Heating Degree Days
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
-
30,000.0
25,000.0
20,000.0
15,000.0
10,000.0
5,000.0
-
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2: Natural Gas - Dtherm
3,000.0
2,500.0
2,000.0
1,500.0
1,000.0
500.0
-
-
5,000.0
10,000.0
15,000.0
20,000.0
25,000.0
30,000.0
Relevant Variables 1: Heating Degree Days

Selected Year
Current year used for comparison charts below. Change to update

Yearly Data Comparison
Compares energy source yearly energy consumption with Relevant Variable yearly total or average

Monthly Data Comparison
Compares energy source consumption with Relevant Variable by month

Direct Comparison
Energy consumption is directly plotted against the Relevant Variable

EC-RV sheet

NOTES

GO TO
Table of Contents

- The ***EC-RV Charts*** sheet will be hidden until both **Energy Consumption** and **Tracked Relevant Variables** have been added
- Change the selected **source** or **factor** to update the the charts
- Changing the selected **source** or **factor** will also update the selected **source** or **factor** on the related sheet
- Changing the *Year* will update both monthly comparison charts
- The *Show average instead of total* checkbox will change the yearly total to yearly average to better represent **Relevant Variables** that are not cumulative

Energy Uses sheet

LAYOUT

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Table of Contents

Number # of Groups
The number # selected controls the number of groups displayed below

Number # of Items
This controls the number of items included in this group

Duplicate Previous Year
Copies previous years data to current year

Energy Use Group Total Yearly Energy Consumption
Total for each groups yearly energy end-use

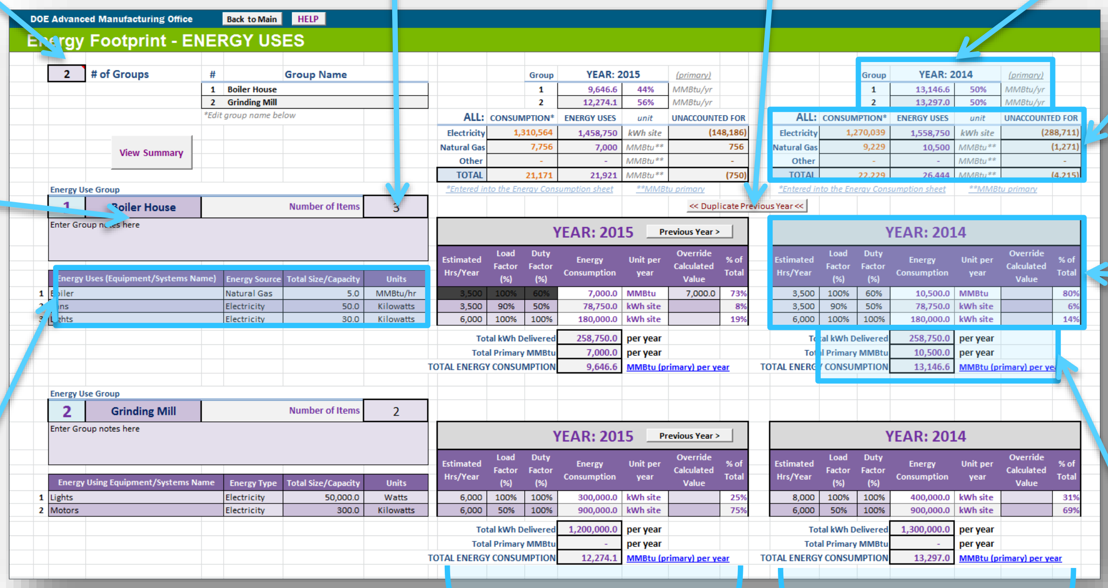
Group Name and Notes
Enter group name and descriptive details about the group

Yearly Energy Source Breakdown
Yearly energy consumption for each energy use group and overall by energy source

Energy Use
Energy consumption by energy use estimated or directly entered

Group Item List
List of equipment and other energy uses that are included in this group

Group Energy Source Breakdown
Energy use group total energy consumption by energy source



DOE Advanced Manufacturing Office

Energy Footprint - ENERGY USES

2 # of Groups

#	Group Name
1	Boiler House
2	Grinding Mill

*Edit group name below

Group	YEAR: 2015		(primary)
1	9,646.6	44%	MMBtu/yr
2	12,274.1	56%	MMBtu/yr

ALL:	CONSUMPTION*	ENERGY USES	unit	UNACCOUNTED FOR
Electricity	1,310,564	1,458,750	kWh site	(148,186)
Natural Gas	7,756	7,000	MMBtu**	756
Other	-	-	MMBtu**	-
TOTAL	21,171	21,921	MMBtu**	(750)

*Entered into the Energy Consumption sheet **MMBtu primary

Group	YEAR: 2014		(primary)
1	13,146.6	50%	MMBtu/yr
2	13,297.0	50%	MMBtu/yr

ALL:	CONSUMPTION*	ENERGY USES	unit	UNACCOUNTED FOR
Electricity	1,270,039	1,558,750	kWh site	(288,711)
Natural Gas	9,229	10,500	MMBtu**	(1,271)
Other	-	-	MMBtu**	-
TOTAL	22,229	26,444	MMBtu**	(4,215)

*Entered into the Energy Consumption sheet **MMBtu primary

Energy Use Group

1 Boiler House Number of Items 3

Enter Group notes here

	Energy Uses (Equipment/Systems Name)	Energy Source	Total Size/Capacity	Units
1	Boiler	Natural Gas	5.0	MMBtu/hr
2	ns	Electricity	50.0	Kilowatts
3	Lights	Electricity	30.0	Kilowatts

YEAR: 2015

Estimated Hrs/Year	Load Factor (%)	Duty Factor (%)	Energy Consumption	Unit per year	Override Calculated Value	% of Total
3,500	100%	60%	7,000.0	MMBtu	7,000.0	73%
3,500	90%	50%	78,750.0	kWh site		8%
6,000	100%	100%	180,000.0	kWh site		19%

Total kWh Delivered 258,750.0 per year
Total Primary MMBtu 7,000.0 per year
TOTAL ENERGY CONSUMPTION 9,646.6 MMBtu (primary) per year

YEAR: 2014

Estimated Hrs/Year	Load Factor (%)	Duty Factor (%)	Energy Consumption	Unit per year	Override Calculated Value	% of Total
3,500	100%	60%	10,500.0	MMBtu		80%
3,500	90%	50%	78,750.0	kWh site		6%
6,000	100%	100%	180,000.0	kWh site		14%

Total kWh Delivered 258,750.0 per year
Total Primary MMBtu 10,500.0 per year
TOTAL ENERGY CONSUMPTION 13,146.6 MMBtu (primary) per year

Energy Use Group

2 Grinding Mill Number of Items 2

Enter Group notes here

	Energy Using Equipment/Systems Name	Energy Type	Total Size/Capacity	Units
1	Lights	Electricity	50,000.0	Watts
2	Motors	Electricity	300.0	Kilowatts

YEAR: 2015

Estimated Hrs/Year	Load Factor (%)	Duty Factor (%)	Energy Consumption	Unit per year	Override Calculated Value	% of Total
6,000	100%	100%	300,000.0	kWh site		25%
6,000	50%	100%	900,000.0	kWh site		75%

Total kWh Delivered 1,200,000.0 per year
Total Primary MMBtu - per year
TOTAL ENERGY CONSUMPTION 12,274.1 MMBtu (primary) per year

YEAR: 2014

Estimated Hrs/Year	Load Factor (%)	Duty Factor (%)	Energy Consumption	Unit per year	Override Calculated Value	% of Total
8,000	100%	100%	400,000.0	kWh site		31%
6,000	50%	100%	900,000.0	kWh site		69%

Total kWh Delivered 1,300,000.0 per year
Total Primary MMBtu - per year
TOTAL ENERGY CONSUMPTION 13,297.0 MMBtu (primary) per year

Current Selected Year

Previous Year

Energy Uses sheet

NOTES

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- The ***Energy Uses*** sheet uses navigation buttons to switch the current year displayed
- Only 2 years are displayed at a time, the current selected year and the year previous to that
- A previous years Energy End-Use data can be copied to the current selected year by clicking the *Duplication Previous Year* button and typing *"confirm"* into the confirm popup
- The ***Energy Uses*** sheet attempts to estimate the equipment energy consumption by using load factor, duty factor, and operating hours. If the actual energy consumption is known, it can be entered in the override field and other will be ignored
- A *Summary* of the equipment, group, and total energy consumption by year can be displayed by clicking the *View Summary* button

EU Charts sheet

LAYOUT

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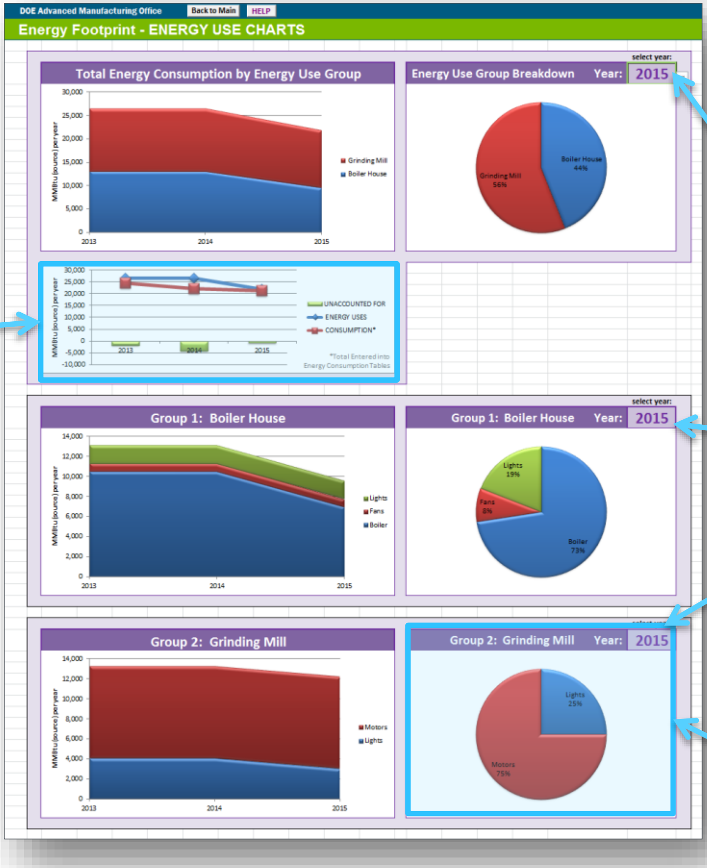
DOE Advanced Manufacturing Office
Back to Main
HELP
Energy Footprint - ENERGY USE CHARTS
Total Energy Consumption by Energy Use Group
Energy Use Group Breakdown
Year: 2015
select year:
Grinding Mill
Boiler House
Grinding Mill 56%
Boiler House 44%
UNACCOUNTED FOR
ENERGY USES
CONSUMPTION*
*Total Entered into Energy Consumption Tables
Group 1: Boiler House
Lights
Fans
Boiler
Lights 19%
Fans 8%
Boiler 73%
Group 2: Grinding Mill
Motors
Lights
Lights 25%
Motors 75%
MMBtu (source) per year
2013
2014
2015

Total Yearly Energy Use
Comparing all groups

Total Yearly Energy Use and Energy Consumption Comparison

Group Specific Charts
Charts for each active energy use group

Selected Year
Pie charts display data for selected year. Change any selected year to update all

Pie Chart of Energy Use

EU Charts sheet

NOTES

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Table of Contents

- Changing any of the selected *Years* will update all select *Years* and associated pie charts
- The charts display groups and items based on the *number of groups/items* selected on the ***Energy Uses*** sheet. This means blank rows will still be charted if they are visible. To correct this, adjust the *number of groups/items* on the ***Energy Uses*** sheet to match the number of groups/items with data.
- The chart comparing **Energy Use** with **Energy Consumption** only displays energy consumption for energy use groups and overall by year. To compare energy consumption by energy use in more detail, review the summary tables in the ***Energy Uses*** sheet

EnPI Table sheet

LAYOUT

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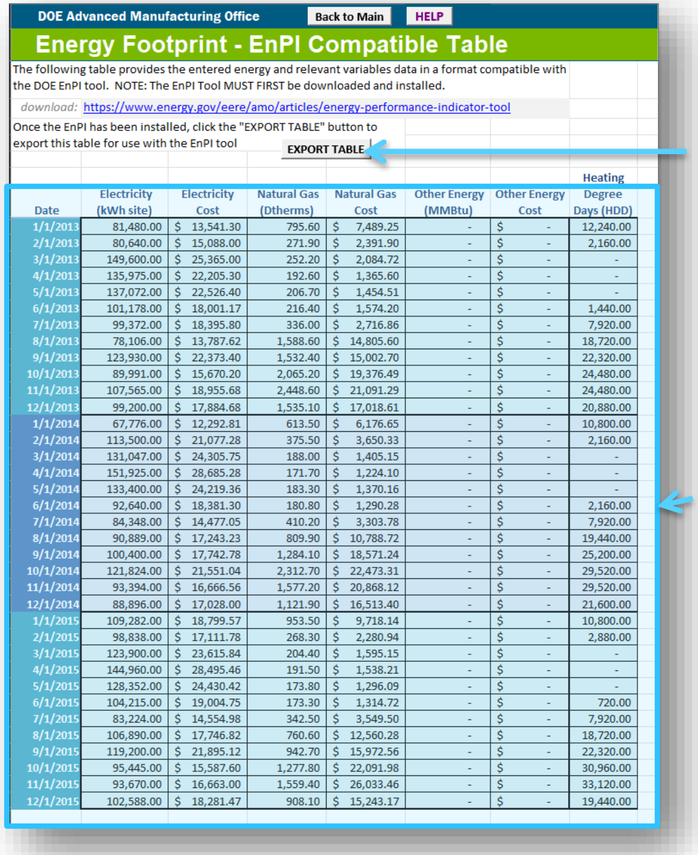

Energy Footprint - EnPI Compatible Table

The following table provides the entered energy and relevant variables data in a format compatible with the DOE EnPI tool. NOTE: The EnPI Tool MUST FIRST be downloaded and installed.

download: https://www.energy.gov/eere/amo/articles/energy-performance-indicator-tool

Once the EnPI has been installed, click the "EXPORT TABLE" button to export this table for use with the EnPI tool

Date	Electricity (kWh site)	Electricity Cost	Natural Gas (Dtherms)	Natural Gas Cost	Other Energy (MMBtu)	Other Energy Cost	Heating Degree Days (HDD)
1/1/2013	81,480.00	$ 13,541.30	795.60	$ 7,489.25	-	$ -	12,240.00
2/1/2013	80,640.00	$ 15,088.00	271.90	$ 2,391.90	-	$ -	2,160.00
3/1/2013	149,600.00	$ 25,365.00	252.20	$ 2,084.72	-	$ -	-
4/1/2013	135,975.00	$ 22,205.30	192.60	$ 1,365.60	-	$ -	-
5/1/2013	137,072.00	$ 22,526.40	206.70	$ 1,454.51	-	$ -	-
6/1/2013	101,178.00	$ 18,001.17	216.40	$ 1,574.20	-	$ -	1,440.00
7/1/2013	99,372.00	$ 18,395.80	336.00	$ 2,716.86	-	$ -	7,920.00
8/1/2013	78,106.00	$ 13,787.62	1,588.60	$ 14,805.60	-	$ -	18,720.00
9/1/2013	123,930.00	$ 22,373.40	1,532.40	$ 15,002.70	-	$ -	22,320.00
10/1/2013	89,991.00	$ 15,670.20	2,065.20	$ 19,376.49	-	$ -	24,480.00
11/1/2013	107,565.00	$ 18,955.68	2,448.60	$ 21,091.29	-	$ -	24,480.00
12/1/2013	99,200.00	$ 17,884.68	1,535.10	$ 17,018.61	-	$ -	20,880.00
1/1/2014	67,776.00	$ 12,292.81	613.50	$ 6,176.65	-	$ -	10,800.00
2/1/2014	113,500.00	$ 21,077.28	375.50	$ 3,650.33	-	$ -	2,160.00
3/1/2014	131,047.00	$ 24,305.75	188.00	$ 1,405.15	-	$ -	-
4/1/2014	151,925.00	$ 28,685.28	171.70	$ 1,224.10	-	$ -	-
5/1/2014	133,400.00	$ 24,219.36	183.30	$ 1,370.16	-	$ -	-
6/1/2014	92,640.00	$ 18,381.30	180.80	$ 1,290.28	-	$ -	2,160.00
7/1/2014	84,348.00	$ 14,477.05	410.20	$ 3,303.78	-	$ -	7,920.00
8/1/2014	90,889.00	$ 17,243.23	809.90	$ 10,788.72	-	$ -	19,440.00
9/1/2014	100,400.00	$ 17,742.78	1,284.10	$ 18,571.24	-	$ -	25,200.00
10/1/2014	121,824.00	$ 21,551.04	2,312.70	$ 22,473.31	-	$ -	29,520.00
11/1/2014	93,394.00	$ 16,666.56	1,577.20	$ 20,868.12	-	$ -	29,520.00
12/1/2014	88,896.00	$ 17,028.00	1,121.90	$ 16,513.40	-	$ -	21,600.00
1/1/2015	109,282.00	$ 18,799.57	953.50	$ 9,718.14	-	$ -	10,800.00
2/1/2015	98,838.00	$ 17,111.78	268.30	$ 2,280.94	-	$ -	2,880.00
3/1/2015	123,900.00	$ 23,615.84	204.40	$ 1,595.15	-	$ -	-
4/1/2015	144,960.00	$ 28,495.46	191.50	$ 1,538.21	-	$ -	-
5/1/2015	128,352.00	$ 24,430.42	173.80	$ 1,296.09	-	$ -	-
6/1/2015	104,215.00	$ 19,004.75	173.30	$ 1,314.72	-	$ -	720.00
7/1/2015	83,224.00	$ 14,554.98	342.50	$ 3,549.50	-	$ -	7,920.00
8/1/2015	106,890.00	$ 17,746.82	760.60	$ 12,560.28	-	$ -	18,720.00
9/1/2015	119,200.00	$ 21,895.12	942.70	$ 15,972.56	-	$ -	22,320.00
10/1/2015	95,445.00	$ 15,587.60	1,277.80	$ 22,091.98	-	$ -	30,960.00
11/1/2015	93,670.00	$ 16,663.00	1,559.40	$ 26,033.46	-	$ -	33,120.00
12/1/2015	102,588.00	$ 18,281.47	908.10	$ 15,243.17	-	$ -	19,440.00

EXPORT DATA

Generate EnPI tool compatible workbook

Preview Table

This table approximately matches the data and format of the EnPI data input table

EnPI Table sheet

NOTES

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- EnPI stands for *Energy Performance Indicator*
- The ***EnPI Table*** sheet formats the entered data for use with the *EnPI tool* (v5)
- The *EnPI tool* establishes a normalized baseline of energy consumption and tracks annual progress of energy intensity improvements.
- To use this table with the *EnPI tool*, the table must first be exported to a separate workbook. This can be done automatically by clicking the **Export Table** button
- For more information and to download the EnPI tool, goto: https://www.energy.gov/eere/amo/articles/energy-performance-indicator-tool

Raw Data sheet

LAYOUT

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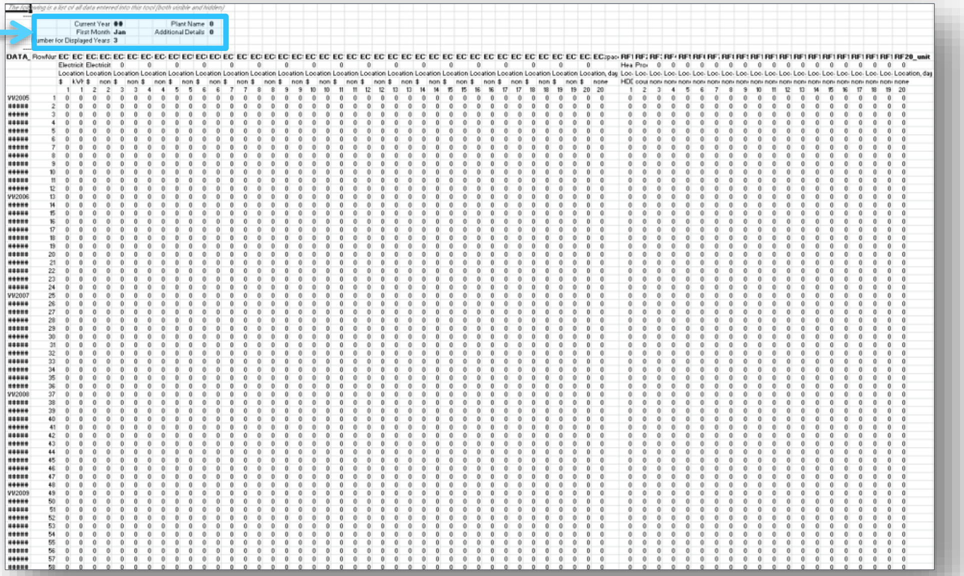
General Settings
Current Year, First Month, Number of Years, Plant Name, and Additional Details



The following is a list of all data entered into this tool (both visible and hidden)

Current Year ##
First Month Jan
umber for Displayed Years 3
Plant Name 0
Additional Details 0

Energy Consumption Data

Relevant Variables Data

Raw Data sheet

NOTES

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- The ***Raw Data*** table provides all of the entered **Energy Consumption** and **Relevant Variables** data in one large table
- This allows advanced users to easily analyze and work with this data outside of the ***Footprint Tool*** as needed
- All data, including hidden data, is included