

**NYSERDA Distributed Generation (DG) Integrated Data  
System**

**Data Integrator  
USER GUIDE**

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# 1. Introduction

This user guide is meant to serve as a navigation tool for NYSERDA's Distributed Generation (DG) Integrated Data System website located at <http://chp.nyserda.ny.gov>. The database system includes monitored performance data and operational statistics for many of NYSERDA's Distributed Generation (DG) demonstration projects.

The goal of the database is to provide meaningful site-level and portfolio-level information that enhances understanding of the technical, economic, and environmental performance of DG systems. The database is intended to allow individual facility managers to better understand reliability, availability, and performance of their particular units and also determine how their facilities compare with other units.

This user guide will introduce the various components of the database and detail how to enter data into the database as well as access graphs and reports based on the database. The website provides many Help screens and much of the information provided in this user guide is available on the site as well.

## 1.1 Website Overview

The website's main component is the Monitored Hourly Performance Data:

- **Monitored Hourly Performance Data** – automatically collected performance data recorded at regular intervals (e.g. 15-minutes or hourly) including electric demand and energy use of the facility, generator power output, fuel use, and thermal energy recovered.

The Monitored Hourly Performance Data portion of the database allows users to view, plot, analyze and compare performance data from one or several different DG sites in the NYSERDA portfolio. The database is intended to provide detailed, highly accurate performance data that can be used by potential users, developers, and other stakeholders to understand the real world performance of these technologies.

## 1.2 Site Navigation

The site can be navigated through the use of the blue tabs at the top of the screen leading to the Home, Facilities, Reports, Links, Help and Login pages. When navigating through menus on any of these pages a site path will appear under the blue tabs to let the user know which menu options they have chosen to lead them to their current location.

## 1.3 Facility Information

Basic facility information is available for many of NYSERDA's DG demonstration sites. Facility information that is publicly accessible includes facility name, location, electric utility, SIC code, primary fuel, number of units, electric output (kW), installation date, prime-mover, and thermal energy use.

### 1.3.1 View Facility Information

To view a list of facilities:

- Click on the **“Facility”** tab at the top of the screen. Note that clicking on any of the column headings will sort the list by that heading.

Figure 1: Screen Shot of Facilities Page

The facilities shown below are currently in the database. Click on a column heading to re-sort by that column. Click on a facility name to view details about that facility. [Click Here](#) to see a map showing all of the facilities.

Buttons: All, ADG, CHP, Solar, Fuel Cell, Main Tier RPS

<a href="#">Facility</a>	<a href="#">Facility Type</a>	<a href="#">Developer</a>	<a href="#">Primary Fuel</a>	<a href="#">Installed Capacity</a>	<a href="#">Monitoring</a>
<a href="#">26th Ward Water Pollution Control Plant</a> Brooklyn, NY	Wastewater Treatment Plant	New York Power Authority	Digester Gas	400 kW	-
<a href="#">Allied Converters, Inc.</a> New Rochelle, NY	Plastics Processing	Advanced Power Systems	Natural Gas	60 kW	-
<a href="#">Avila Retirement Community</a> Albany, NY	Assisted Living Center	Pine Bush Energy	Natural Gas	1170 kW	-
<a href="#">Bronx Zoo</a> Bronx, NY	Zoo	New York Power Authority	Natural Gas	200 kW	-

To view more specific information about any facility:

- Clicking on the site name will provide options to view information about the site.
- Clicking on the link under **“Facility Details”** provides a table of all facility and power unit characteristics data for the site.
- Clicking on links under **“Facility Documentation”** will provide information about the data available in the Monitored Performance database for this site.
- Clicking on links under **“Project Webpages”** will take you away from the NYSERDA page to project summaries or data access webpages for the facility.

### 1.4 Technology Groups

The systems in the database are categorized into technology groups based on prime-mover and size. The technology groups ease comparisons of similar units in graphs and reports and are listed below:

**Reciprocating Engines**

Group 1: <100 kW - 3 MW

**Fuel Cells**

Group 2: <300 kW

**Gas Turbines**

Group 3: 500 kW – 100MW

**Microturbines**

Group 4: All Sizes

**Steam Turbines**

Group 5: <25 MW

**Wind Turbines- land-based**

Group 6: 0.25 kW – 2.5 MW

**Solar Panels**

Group 7: All sizes

### **1.5 Common Terms**

The terms described below are commonly used on the web site.

*Distributed Generation (DG)* - A system where electric power is generated at various locations near the point of use (as opposed to at a central power generating facility).

*Combined Heat and Power (CHP)* – A system that generates electrical power and also provides heat to meet all or part of the loads in a facility.

*Operational Reliability (OR)* - Various measures or metrics that assess or quantify the reliability of a given system or technology.

*Facility* - A commercial, institutional, or industrial location or site that has one or more Power Units installed.

*Power Unit (PU)* - An individual DG/CHP generation unit or system.

*Monitoring Unit (MU)* – a collection of Power Units at a facility that are grouped together for the purpose of monitoring.

*Standard Industrial Classification (SIC)* - A US government system for classifying (by numeric code) business establishments (being replaced by NAICS).

*North American Industry Classification System (NAICS)* - A North American system for classifying (by numeric code) business establishments (developed in 1999 as a replacement for SIC).

*Reciprocating Engines* - an engine in which one or more pistons move up and down in cylinders a piston engine

*Microturbines*- a combustion turbine with a peak generation capacity of one hundred kW or less

*Steam Turbines* - a turbine in which a high-velocity jet of steam rotates a bladed disk or drum

*Fuel Cells* - a cell producing an electric current directly from a chemical reaction

*Gas Turbines* - a turbine driven by expanding hot gases produced by burning fuel

*Solar Panels*- a panel designed to absorb the sun's rays as a source of energy for generating electricity or heating

## **2. Data Entry Guide**

### **2.1 How to Log In**

The majority of actions on the website do not require the user to login. All data reports can be accessed and publicly available facility data viewed without logging in to the site. However, you must login to enter/change facility information for a given site. Login is also necessary to access data for a Main Tier RPS site.

To review the publicly available Facilities and Power Unit Data for the site you can go to the **“Facilities”** tab and select the site. Down the left-hand side of the page, you'll find a link labeled **“Show Complete Details”** under the heading of **“Facility Details.”** This displays all publicly available characteristics data about the facility and CHP system.

When a site signs up to participate in the project and agrees to submit monitored performance a username and password will be created for the site by NYSERDA's project team and emailed to the site manager.

To Log in:

- Click on the **“Login”** tab at the top of the screen
  - Enter the Username and Password as shown below
    - Click **“Log In”**

Figure 2: Screen Shot of Login Page

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**DG Integrated Data System**

Home Facilities Reports Links Help Login

Enter your username and password to log in to the system.  
Logging in will allow access to additional reports and data entry screens.

**Username:**

**Password:**

Log In

[Click Here](#) if you don't know your username or password.

[Privacy Policies](#) | [Disclaimer](#) | [Contact Us](#)

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## 2.2 Change Facility Information

To enter or change facility information:

- Click on the “**Data Entry**” tab at the top of the screen (this requires the user to login)
  - Click on “**Facilities**” on the left-hand menu to change information about the facility.
    - Click on the appropriate function, and enter data into the online form.
      - Click on “**Change Facility Information**”
  - Click on “**Power Units**” on the left-hand menu to change information about the power units for the site.
    - Click on the appropriate function, and enter data into the online form. If “**Change Power Unit Details**” was clicked then select the unit from your site to update.
      - Click on “**Change Unit Information**” or “**Add Unit**” or “**Remove Unit**”

## 2.3 Change Password

To change a site password:

- Click on the “**Data Entry**” tab at the top of the screen (this requires the user to login)
  - Click on “**My Information**” on the left hand menu
    - Click on the appropriate function to change site contact information or login password
      - Click on “**Change Information**” or “**Change Password**”

## 3. Monitored Performance Data

### 3.1 Data Requirements

Detailed system performance data is automatically collected for a site at regular intervals (e.g., 15-minutes or hourly) by a data logger or control system. The required data includes generator power output, fuel input, facility power use, and heat recovery rates. Data can automatically be received as often as once a day. The complete monitoring standards for new NYSERDA DG Projects can be accessed here:

[http://www.cdhenergy.com/data\\_int/Monitoring\\_Data\\_Collection\\_Std.pdf](http://www.cdhenergy.com/data_int/Monitoring_Data_Collection_Std.pdf)

Data Format: Whenever possible, CDH prefers data submitted in comma-separated variable (CSV) format. Column descriptors should go in a header row. Each row should begin with a timestamp. Here is an example of the preferred format:

```
"Standard Date","Total Utility Import Power","Elect Service A Import Pwr"  
12/25/07 00:00:00,31.65,20.73  
12/25/07 00:15:00,31.76,21.61
```

CDH can accept data in other formats, however they will be approved on a case-by-case basis. Data can be supplied in any *consistent* electronic file format. Suggested formats include CSV, txt, ASCII, etc. The files should include time-and-date stamped records that are consistently delimited or in a fixed format. Each file should be provided with a unique filename that corresponds to the site name and the data it contains (e.g., Smith\_unit2\_May05.dat). The monitoring contractor should indicate the format of the data when the username and password is requested.

Additional Data: A list of the measured values or data points that are included in each data file should also be submitted. The list should include the corresponding column/row in the file, the data point name, a description, the engineering units of the measurement (e.g., kWh per interval, avg kW, etc), and the sensor/instrument used to take the reading. The list should indicate if the reading is an average, sum over the interval or a sample. Also a simple schematic of the DG system that shows the location of each data point in the system should be submitted.

### 3.2 Online Monitored Data Reports

The online monitored reports section allows the user to create custom plots and graphs based on user designated data channels, plot types, and time ranges.

#### 3.1.1 Monitored Data Plots and Graphs

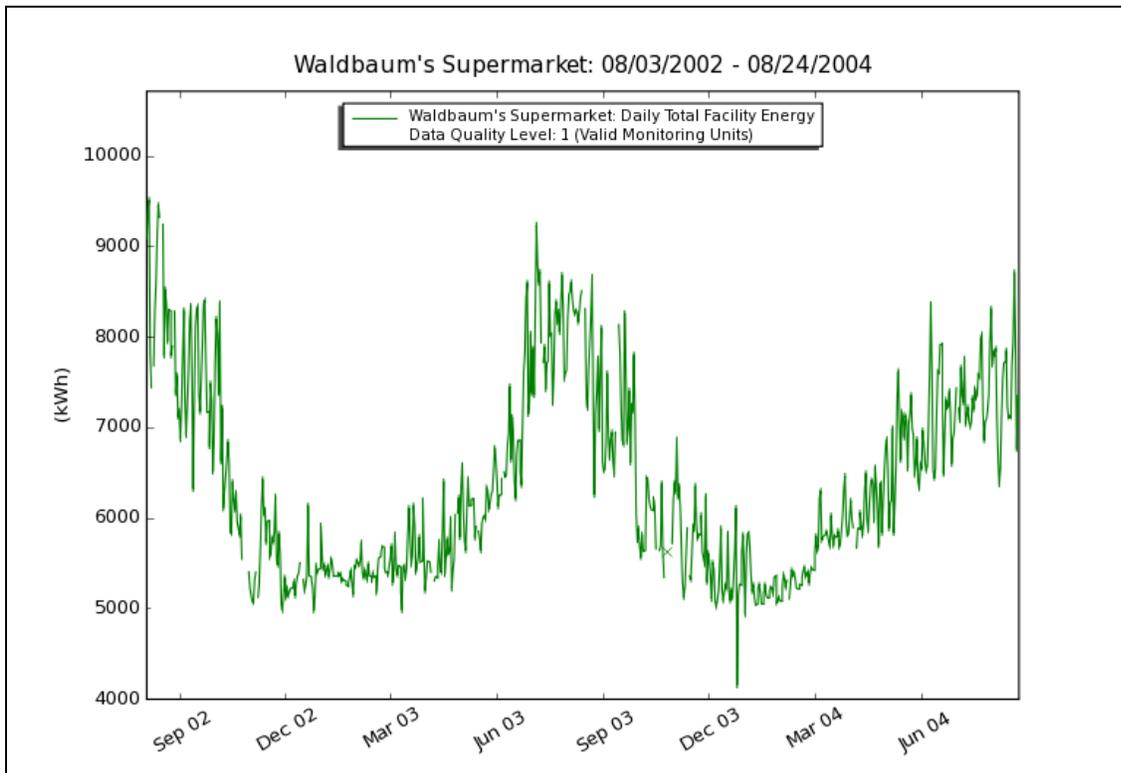
To create monitored data plots:

- Click on the “**Reports**” tab at the top of the screen
  - Scroll down to “**Online Monitored Data Reports**” and click on “**Monitored Data Plots and Graphs**”
    - Select the facility or facilities that should be included and click “**Continue**”

- To create a plot select the desired time range, data channel, and plot type and click “**Continue**”
  - Select the data interval and click “Continue”
    - Click “**Create Report**”

On the “**Report Details**” page there is also an “**Additional Options**” alternative that can be selected. This allows the user to freely specify a time range as well as multiple data channels, custom axes, data quality and multiple figure display methods.

**Figure 3: Monitored Data Sample Plot**



\*Note that all reports open in separate windows.

### 3.1.2 Monitored Data Downloads

To download the monitored data that is used to create the custom plots:

- After generating a custom plot, click the “**Download Plot Data**” on the upper right-hand side of the plot window.
  - If multiple facilities are included on the plot, the data for each site must be downloaded separately
- For the entire dataset for a facility click on the “**Reports**” tab at the top of the screen
  - Scroll down to “**Online Monitored Data Reports**” and click on “**Monitored Data – Download (CSV file)**”
    - Select the facility or facilities that should be included and click “**Continue**”
      - Select the timeframe and data interval and click “**Continue**”

- Click on “**Click Here**” and the data will appear in a CSV file which can be imported into any spreadsheet program (An example in Microsoft Excel is shown below)

**Figure 4: Screen Shot of CSV Download File CHANGE to ACTUAL table**

2	Date		DG/CHP Generator Energy Output kWh	DG/CHP Generator Power Output kW	DG/CHP Gas Input cu ft	Total Facility Purchased Energy kWh	Total Facility Purchased Demand kW	Total Facility Gas Use cu ft	Unused Heat Recovery MBtu
4	Data Quality Definitions: 0 to the number of Valid Monitoring Units								
5	3/1/2005	00:00:00	3337	295.39	29999.3	1044.7	101.78	-2376	0
6	3/2/2005	00:00:00	3323.8	295.76	29247.5	822.5	94.51	-2376	0.7
7	3/3/2005	00:00:00	2677.6	296.02	29900.3	870.8	78.23	-2376	0.1
8	3/4/2005	00:00:00	3276.7	298.46	29339	955.6	80.24	-2376	1.93
9	3/5/2005	00:00:00	3135.3	296.76	29726.7	801.9	109.73	-2376	1.59
10	3/6/2005	00:00:00	0	-0.01	0.07	578.5	114.28	-2376	0
11	3/7/2005	00:00:00	3270.2	289.2	29641.63	984.7	140.46	-2376	9.34
12	3/8/2005	00:00:00	3222	293.15	29158.9	1008.4	123.21	-2376	0.11
13	3/9/2005	00:00:00	3458.8	297.61	29254.4	1007.6	112.98	-2376	3.44
14	3/10/2005	00:00:00	3076.9	297.81	29201.3	949.5	127.98	-2376	0.79
15	3/11/2005	00:00:00	3362.9	294.87	29545.7	874.2	109.03	-2376	0
16	3/12/2005	00:00:00	3195.7	297.42	29412.5	764.3	132.27	-2376	0
17	3/13/2005	00:00:00	0	-0.01	0.07	889.9	83.95	-2376	0
18	3/14/2005	00:00:00	3436.8	296.23	29739.33	989.2	138.58	-2376	0
19	3/15/2005	00:00:00	3394.7	294.2	29644.8	1022	100.65	-2376	1.27
20	3/16/2005	00:00:00	3659.1	295.8	29900.3	946.9	141.93	-2376	0

### 3.1.3 Utility Rate Calculation

The utility rate calculation function allows users to evaluate the economic savings of a project based on an electric utility rate, average gas price, generator maintenance cost, and heat recovery value. This tool makes it possible to compare the economics of the same facility operating under a different utility or a different rate classification.

To perform a utility rate calculation:

- Click on the “**Reports**” tab at the top of the screen
  - Scroll down to “**Online Monitored Data Reports**” and click on “**Utility Rate Calculation**”
    - Select the desired facility and click “**Continue**”
      - Select the timeframe, utility rates, generator gas cost, generator maintenance cost, and heat recovery value and click “**Continue**”
        - If prompted, enter the CHP rate contract demand and click “**Continue**”
          - Click “**View Report**”

Figure 5: Sample Utility Rate Calculation Report

Month	Base Facility			CHP Facility			Net Savings	
	Niagara Mohawk - SC2ND Small General Non-demand (Frontier Region)			Niagara Mohawk - SC7 Standby (SC3 Base - Large General) - Secondary (Frontier Region)			Electric Savings (kWh)	Cost Savings (\$)
	Peak Demand (max kW)	Total Energy Use (kWh)	Electric Costs (\$)	Peak Demand (max kW)	Total Energy Use (kWh)	Electric Costs (\$)		
January 2003	292.1	176,387	\$ 21,639.52	288.9	176,330	\$ 13,903.18	57	\$ 7,736.35
February 2003	299.4	162,003	\$ 20,403.36	299.4	162,003	\$ 13,726.82	0	\$ 6,676.54
March 2003	349.9	182,989	\$ 22,940.47	341.2	182,816	\$ 15,061.61	172	\$ 7,878.86
April 2003	358.1	175,288	\$ 22,349.66	358.1	159,845	\$ 13,885.25	15,443	\$ 8,464.41
May 2003	345.1	199,450	\$ 24,782.86	323.2	168,437	\$ 14,130.21	31,013	\$ 10,652.65
June 2003	480.2	216,585	\$ 26,747.02	431.2	177,128	\$ 15,012.06	39,457	\$ 11,734.96
July 2003	480.6	260,308	\$ 32,202.76	433.8	220,742	\$ 17,387.32	39,567	\$ 14,815.44
August 2003	455.5	248,837	\$ 30,977.02	455.2	237,576	\$ 18,702.92	11,261	\$ 12,274.10
September 2003	416.3	213,176	\$ 26,629.98	370.1	190,754	\$ 15,166.30	22,422	\$ 11,463.68
October 2003	345.0	187,120	\$ 23,484.74	322.6	153,183	\$ 12,963.49	33,937	\$ 10,521.25
November 2003	383.7	178,006	\$ 22,408.85	330.5	167,825	\$ 14,184.21	10,181	\$ 8,224.64
December 2003	302.6	172,067	\$ 21,109.08	302.6	166,670	\$ 13,357.29	5,398	\$ 7,751.79
<b>Annual Totals</b>	<b>480.6</b>	<b>2,372,215</b>	<b>\$ 295,675.34</b>	<b>455.2</b>	<b>2,163,308</b>	<b>\$ 177,480.67</b>	<b>208,907</b>	<b>\$ 118,194.67</b>
<b>Average (\$/kWh)</b>			<b>\$ 0.1246</b>			<b>\$ 0.0820</b>		<b>\$ 0.5658</b>

## 6. Frequently Asked Questions

The following FAQ can also be accessed on the website through the Help tab.

- *What is DG?*
  - Distributed generation (DG) is the use of small-scale power generation technologies located at or near the point of use. One type of DG is Combined Heat and Power (CHP) where technologies produce both electricity and useful thermal energy from one fuel. Because CHP systems utilize thermal energy, which is normally wasted, they are very efficient.
- *What are the technology groups?*
  - The technology groups refer to the different kinds of prime-movers that can be used in DG applications, such as reciprocating engines, gas turbines, microturbines, solar panels and fuel cells.
- *Where can I find a glossary of terms?*
  - A glossary of terms is available on the Help page under the heading “Common Terms”.

## Monitoring Data

- *What is a Monitoring Unit?*
  - A monitoring unit (MU) is a collection of power units at a facility that are grouped together from the constraints of the data collection method. This is most commonly observed when a facility may have many power units, but only one fuel meter for the power units, resulting in data for all the individual power units being combined into one monitoring unit. One monitoring unit may record performance for one or more power units, and there may be more than one monitoring unit per facility.
- *What is a Power Unit?*
  - A power unit (PU) is the actual electrical generator. Examples of power units include the following:
    - Microturbines
    - Fuel Cells
    - Gas Turbine
    - Engine Generators
    - Wind Turbine
    - Solar Panel
- *How do I plot data?*
  - Data collected by the system can be plotted by clicking on the Monitored Data - Plots and Graphs option, which is accessed under the Reports tab. Depending on the plot options selected, there are typically three or four steps required to plot data.
    1. Select the facilities to be plotted. Facilities can be selected individually, or grouped as desired. Groups of facilities can be selected by choosing from different classification types, such as Sector, Electric Utility, or Generator Technology.
    2. Select the date range desired, data channel(s) to be plotted, plot type, and other plotting options (selectable by choosing the additional options link).
    3. Select the plot data interval (hourly, daily, or monthly data) if necessary.
    4. An additional response may be required to select the Aggregation Quality desired.
- *What kinds of data can be plotted?*
  - The data points available for each facility is dependent on the technology group. The following lists the data points for each technology group.

## CHP

1. DG Generator Output
2. DG Generator Output Demand
3. DG Generator Gas Input
4. Total Facility Purchased Energy
5. Total Facility Purchased Demand
6. Other Facility Gas Use
7. Total Facility Energy
8. Total Facility Energy Demand
9. Useful Heat Recovery
10. Unused Heat Recovery
11. Status/Runtime of DG Generator
12. Ambient Temperature
13. Total CHP Efficiency
14. Electrical Efficiency

## ADG

1. DG Generator Output
2. DG Generator Output Demand
3. DG Generator Gas Input
4. Flare Gas
5. Status/Runtime of DG Generator
6. Ambient Temperature
7. Electrical Efficiency

## Solar

1. DG Generator Output
2. DG Generator Output Demand
3. Ambient Temperature

## Fuel Cell

1. DG Generator Output
2. DG Generator Output Demand
3. Status/Runtime of DG Generator
4. Ambient Temperature

## RPS

1. DG Generator Output
2. DG Generator Output Demand
3. Ambient Temperature

- *What is the difference between the "Simple" and the "Additional" plotting options?*
  - The Simple Plotting contains options that are the most common for plotting the data. The Additional Options allows you better control through a number of options for plotting data. Under the Additional Options, you can do things like plot data channels on separate plots or combine data for monitoring units into a single data set. You can also choose to plot any two data channels against each other in a custom XY scatter plot. There is also the option to select the Data Quality methods to apply. Changing the Data Quality method will result in more data being displayed on the plot, but the certainty that the data represents useful information will decrease. Under the simple interface, the Data Quality is always set to the highest level for the type of plot. For more details see the section on Plotting Control Details.
  
- *How do I download data?*
  - Data can be downloaded by selecting Monitored Data - Download (CSV file) under the Reports tab. You can select the desired sites, the date range and the data interval for download. The data is displayed in a comma separated variable (CSV) file that is easily imported into most spreadsheet programs. Data can also be downloaded after creating a plot. A Download Plot Data button appears at the top of the plot output page containing the data displayed in the plot. For each monitoring unit included in the plot, there are separate files available for download.

## **Logging In**

- *How do I log in?*
  - You may login by entering your username and password on the login page of the website.
- *What if I don't know my password?*
  - If you do not know your password or have forgotten your password go to the support page and click on the contact us option on the menu.
- *How can I change my password?*
  - After logging in with a valid username and password, go to the data entry page of the website and in the user information section there is an option to change your password.

## **7. Help / Contact Information**

For questions concerning the monitored performance data portion of the website contact:

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 CDH Energy Corp.  
 315-655-1063 x15  
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