

**NYSERDA Distributed Generation / Combined Heat and
Power 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 DG/CHP Integrated Data System website located at <http://chp.nyserda.org>. The database system includes monitored performance data and operational statistics for many of NYSERDA's Distributed Generation (DG)/Combined Heat and Power (CHP) 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/CHP 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 is divided into two primary components:

- **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.
- **Operational Reliability (OR) Data** - manually entered monthly operating hours and outage events, that will be used to calculate such reliability parameters as availability factor, forced outage rate, scheduled outage factor, service factor, meantime between forced outages, and mean down time.

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/CHP sites in the NYSERDA portfolio. It allows DG/CHP operators at NYSERDA sites to enter and update information about their system. The database is intended to provide detailed, highly accurate performance data that can be used by potential users, developers, and other stakeholders to understand and gain confidence in this promising technology.

The Operational Reliability Data portion of 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. Information on reliability and availability performance will enable potential onsite power users to make a more informed purchase decision, and will help policy makers quantify reliability benefits of customer-sited generation.

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, Data Entry, 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

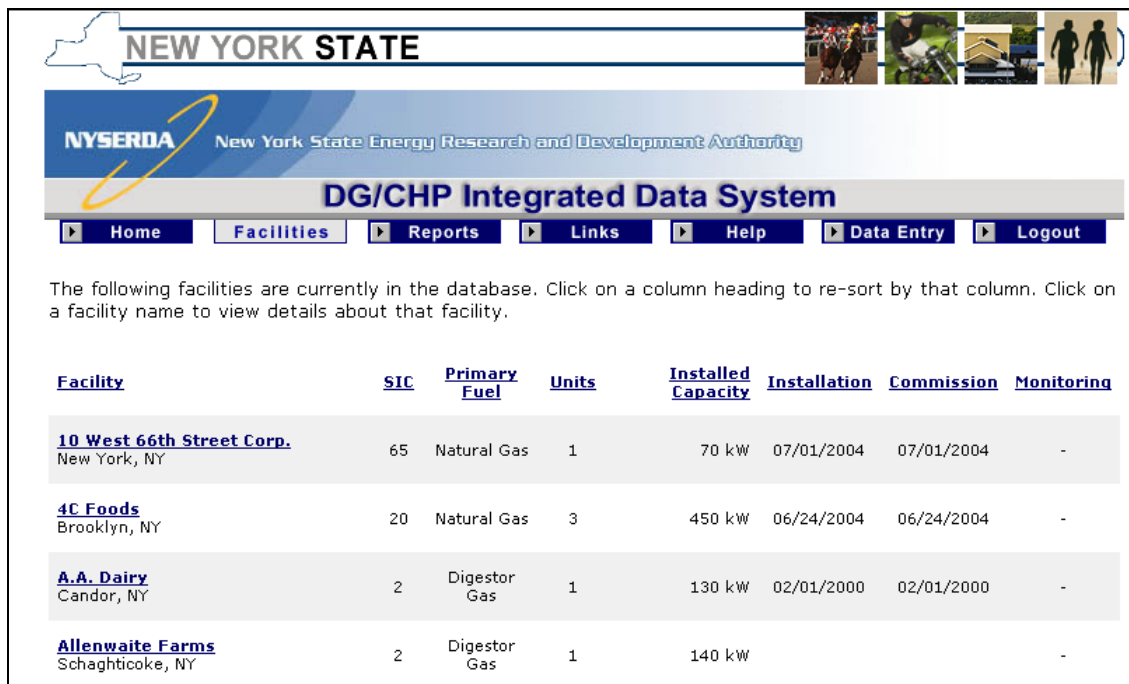
Basic facility information is available for many of NYSERDA's DG/CHP demonstration sites. Facility information that is publicly accessible includes facility name, location, electric utility, SIC code, primary fuel, number of units, electric output (kW), installation date, prime-mover, and thermal energy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



<u>Facility</u>	<u>SIC</u>	<u>Primary Fuel</u>	<u>Units</u>	<u>Installed Capacity</u>	<u>Installation</u>	<u>Commission</u>	<u>Monitoring</u>
10 West 66th Street Corp. New York, NY	65	Natural Gas	1	70 kW	07/01/2004	07/01/2004	-
4C Foods Brooklyn, NY	20	Natural Gas	3	450 kW	06/24/2004	06/24/2004	-
A.A. Dairy Candor, NY	2	Digester Gas	1	130 kW	02/01/2000	02/01/2000	-
Allenwaite Farms Schaghticoke, NY	2	Digester Gas	1	140 kW			-

To view more specific information about any facility:

- 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 NYSEDA page to project summaries or data access webpages for the facility.

- Clicking on links under “**Related Webpages**” will direct your away from the NYSERDA page to articles and presentations about the DG/CHP Project at this site.

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

Group 2: 100 - 800 kW

Group 3: 800 kW – 3 MW

Fuel Cells

Group 4: <300 kW

Gas Turbines

Group 5: 500 kW – 5 MW

Group 6: 5 MW – 20 MW

Group 7: 20 – 100 MW

Microturbines

Group 8: All Sizes

Steam Turbines

Group 9: <25 MW

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).

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, operating, or outage data for a given 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 and/or operational reliability data, 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

NEW YORK STATE

NYSERDA New York State Energy Research and Development Authority

DG/CHP 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:

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

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”**

2.4 Operational/Reliability Data Entry

The system operator at each site must enter operational reliability data once a month. This data includes information on any scheduled or unscheduled equipment outages at the site, including the time and date of the outage, its cause, and the resolution. The site will be reminded each month by email when it is time to enter new outage information.

2.4.1 Enter Operating Data

To enter operating data:

- Click on the **“Data Entry”** tab at the top of the screen
 - Click on **“Operating Data”** on the menu to the left side of the screen
 - Click on **“Enter New Data”**
 - Enter the data into the online form and click **“Submit Data”**

A colored legend on the entry page will indicate which months have operating data entered into the database. This legend can be used to prevent entering data for the same month twice. If data is submitted for a month that already has data in the database an error warning will pop up on the screen.

Figure 3: Screen Shot of Operating Data Entry Page

Previous Entries:

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
2002	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
2003	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
2004	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
2005	Red	Red	Green	Green	Green	Green	Red	Red	Red	Red	Red	Red

Data for all units **Data for some units** **No data**

Enter monthly operating data for each power unit:

Month and Year:

Unit	Operable	Attempted Starts	Successful Starts
1	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>
2	<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>

2.4.2 Enter Outage Data

To enter outage data:

- Click on the **“Data Entry”** tab at the top of the screen
 - Click on **“Outages”** on the menu to the left side of the screen
 - Click on **“Enter New Data”**
 - Enter the data into the online form and click **“Submit Data”**
 - When entering Forced Outages, further screens will pop up asking for the specific outage cause, component, and corrective action.

A similar legend shows up on the outage entry screen indicating which months have outage data entered. However, unlike the operating data, the outage page is designed to handle multiple outages per month.

2.4.3 Change Previously Entered Data

To change or remove previously entered operating or outage data, follow the same steps as entering data however click on the appropriate function on the menu screen and follow the prompts. Please use caution when removing data from the database; if data is accidentally removed contact the project team so that it can be recovered.

2.5 Enter/Change Emissions Data

To enter emissions data (this requires login):

- Click on the **“Data Entry”** tab at the top of the screen
 - Click on **“Emissions”** on the menu on the left side of the screen
 - Click on **“Enter New Data”**

- Enter the data into the online form and click “**Submit Data**”

To change, remove, or view previous emissions data entries follow the same steps as above with the appropriate change in function on the third step.

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/CHP Projects can be accessed here:

http://www.cdhenergy.com/data_int/Monitoring_Data_Collection_Std.pdf

Data Format: 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).

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/CHP 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.

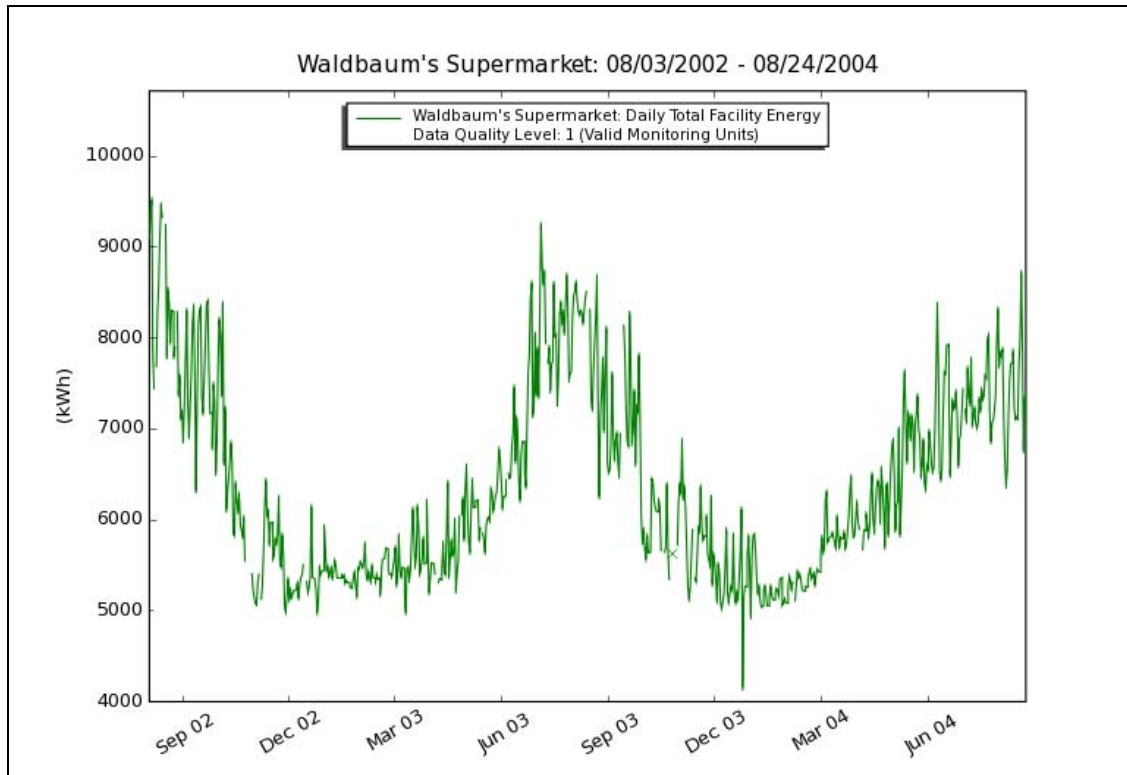
3.1.1 Monitored Data Plots and Graphs

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 Selection**” 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 4: 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 CSV 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 5: Screen Shot of CSV Download File

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
3								
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 6: 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
Annual Totals	480.6	2,372,215	\$ 295,675.34	455.2	2,163,308	\$ 177,480.67	208,907	\$ 118,194.67
Average (\$/kWh)			\$ 0.1246			\$ 0.0820		\$ 0.5658

3.3 Standardized Monitored Data Reports

The standardized monitored data reports are a collection of pre-fabricated reports that summarize the monitored performance data in select graphs and data tables.

3.3.1 Generator, Facility, and Meter Power

To view the Generator, Facility, and Meter Power Summary report:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Standardized Monitored Data Reports**” and click on “**Generator, Facility, and Meter Power**”
 - Select the desired facility and click “**Continue**”
 - Click on the link for the desired month or annual report

3.3.2 Generator Status, Gas Use, Heat Recovery, and Facility Gas Use

To view the Generator Status, Gas Use, Heat Recovery, and Facility Gas Use Summary report:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Standardized Monitored Data Reports**” and click on “**Generator Status, Gas Use, Heat Recovery, and Facility Gas Use**”
 - Select the desired facility and click “**Continue**”
 - Click on the link for the desired month or annual report

3.3.3 Generator Power Quality

To view the Generator Power Quality Summary report:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Standardized Monitored Data Reports**” and click on “**Generator Power Quality**”
 - Select the desired facility and click “**Continue**”
 - Click on the link for the desired month or annual report

3.3.4 Facility Meter Power Quality

To view the Facility Meter Power Quality Summary report:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Standardized Monitored Data Reports**” and click on “**Facility Meter Power Quality**”
 - Select the desired facility and click “**Continue**”
 - Click on the link for the desired month or annual report

4. Operational Reliability Data

The increased deployment of DG/CHP has been identified as a means to enhance both individual customer reliability and electric transmission and distribution system reliability. DG/CHP reliability and availability performance relates to several significant issues affecting market development. The reliability/availability profiles for DG/CHP systems can affect electric standby charges and back-up rates, the value of ancillary services offered to Independent Transmission System Operators (ISO), local grid stability and reliability, customer power delivery system reliability, and customer economics.

4.1 Operational Reliability Measures

The following table shows the operational reliability measures that are calculated by the database and the formulas that are used to calculate them.

Table 1: Operational Reliability Measure Definitions and Formulas

OR Measure	Formula
Period of Demand (POD, hours): Measures the time the unit was planned to operate.	$POD = PH - RSH - SOH$
Availability Factor (AF, %): Measures, on a percent basis, the unit's "could run" capability. Impacted by planned and unplanned maintenance.	$AF = \frac{(PH - SOH - FOH) * 100}{PH}$
Running Availability (RR, %): Measures, on a percent basis, probability of avoidance of forced outages. Accounts for planned, unplanned, and administrative outages.	$RR = \frac{PH - FOH - SOH - AOH * 100}{PH - SOH - AOH}$
Forced Outage Rate (FOR, %): Measures portion of time due to unplanned factors	$FOR = \frac{FOH * 100}{(SH + FOH)}$
Scheduled Outage Factor (SOF, %): Measures percent of time set aside for planned maintenance	$SOF = \frac{SOH * 100}{PH}$
Service Factor (SF, %): Percent of total period hours the unit is on-line. Varies due to site related or economic factors	$SF = \frac{SH * 100}{PH}$
Mean Time Between Force Outages (MTBFO, hours): Measure the nominal time between unscheduled forced outages	$MTBFO = \frac{SH}{\# \text{ Forced Outages}}$
Mean Down Time (MDT, hours): Measures the nominal duration the unit is down during maintenance events	$MDT = \frac{SOH + FOH}{\# \text{ Forced Outages} + \# \text{ Planned Outages}}$

Formula terms are defined as follows:

PH: Period Hours

RSH: Reserve Shutdown Hours

SOH: Scheduled Outage Hours

SH: Service Hours

AOH: Administrative Outage Hours

FOH: Forced Outage Hours

4.2 Outage Types

Administrative Outage - Waiting time, force majeure events, or other outage not inherent to equipment aspects.

Forced Derate - Immediate, delayed, or postponed unplanned derate.

Forced Outage - Immediate, delayed, or postponed unplanned outage.

Maintenance Outage - Outage that can be delayed beyond the next weekend but before the next long-lead planned outage.

Planned Derate - Derate scheduled well in advance and having a predetermined duration.

Planned Outage - Outage scheduled well in advance and having a predetermined duration.

Reserve - Time when the system is available to run but is not utilized/dispatched due to economic or other strategic reasons.

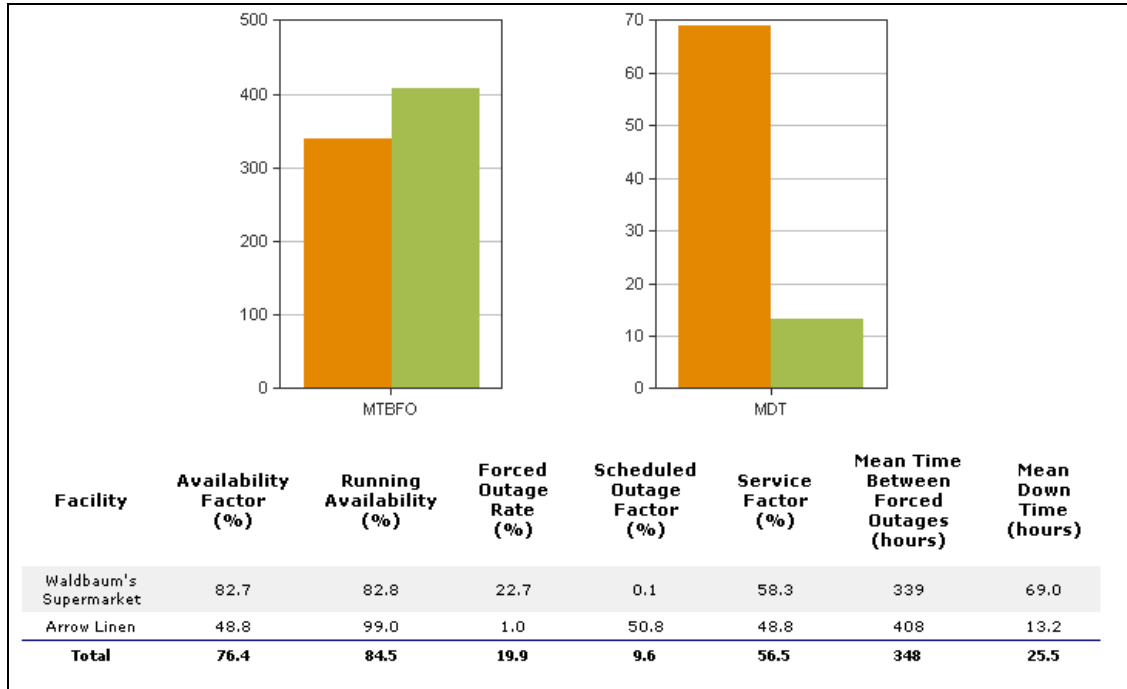
4.3 Operational Reliability Reports

The operational reliability reports summarize the calculated OR measures for each site. The reports allow multiple sites to be represented on the same graph and compared, and it is also possible to compare application sectors, electric utilities, and technologies.

To view Operational Reliability Reports:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Operational/Reliability Reports**” and click on “**Operational Reliability Report**”.
 - Select the appropriate facility/facilities and click the “**Continue**” button.
 - Select a starting and ending date and click “**Continue**”
 - Select how the report should be grouped and click “**Create Report**”

Figure 7: Screen Shot of Sample Operational Reliability Report



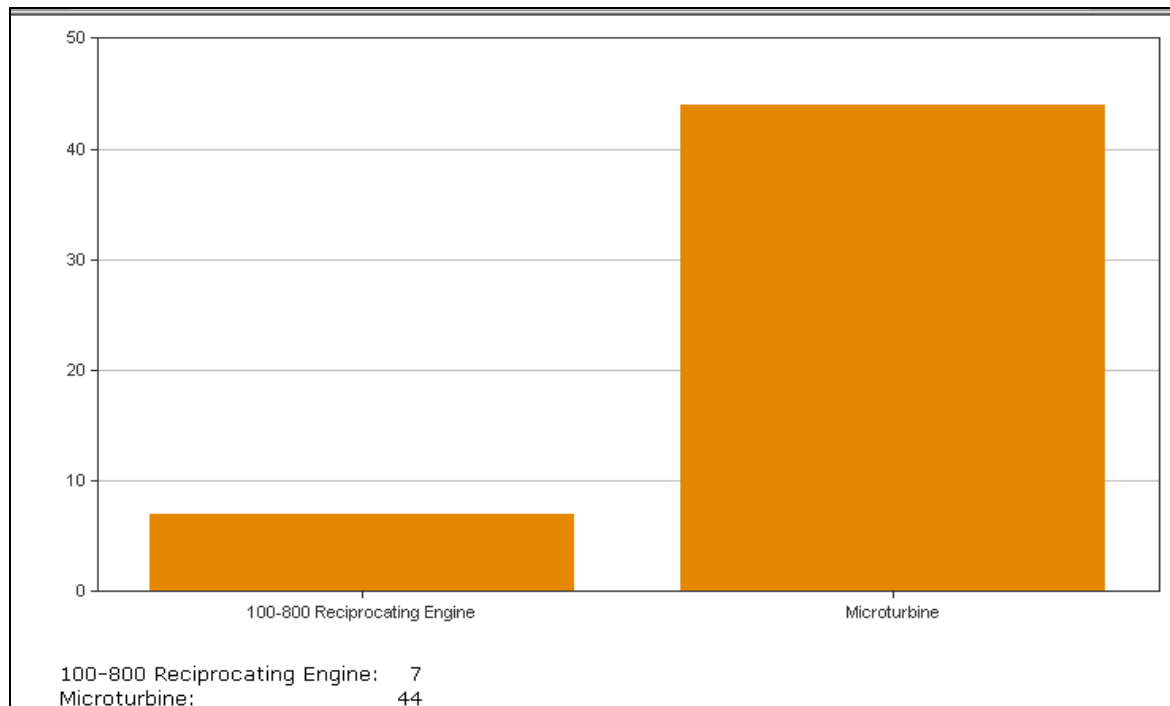
4.4 Outage Reports

The outage reports summarize the number, type, and cause of outages for each site. Similar to the operational reliability reports, the outage reports allow multiple sites to be represented on the same graph and their outage characteristics compared.

To view Outage Reports:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Operational/Reliability Reports**” and click on “**Outage Report**”.
 - Select the appropriate facility/facilities and click the “**Continue**” button.
 - Select a starting and ending date and click “**Continue**”
 - Select how the report should be grouped and click “**Create Report**”

Figure 8: Screen Shot of Sample Outage Report



5. Emissions Data

5.1 View Emissions Data

To view emissions data:

- Click on the “**Reports**” tab at the top of the screen
 - Scroll down to “**Emissions Reports**” and click on “**Emissions Test Report**”.
 - Select the appropriate facility/facilities and click the “**Continue**” button.
 - Click on “**Create Report**”.

Note that emissions data is not monitored continually and often comes from one-time tests or manufacturer specifications.

6. Frequently Asked Questions

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

Terms

- *What is DG/CHP?*
 - 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 is Operational Reliability (OR)?*

- Operational reliability refers to the dependability of a CHP system and is quantified using measures like availability factor, forced outage rate, scheduled outage factor, service factor, and mean down time etc. The reliability/availability profiles for DG/CHP systems can affect electric standby charges and back-up rates, the value of ancillary services offered to independent transmission system operators (ISO), local grid stability and reliability, customer power delivery system reliability, and customer economics.
- *What are the technology groups?*
 - The technology groups refer to the different kinds of prime-movers that can be used in DG/CHP applications, such as reciprocating engines, gas turbines, microturbines, 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”. Definitions for Monitoring, OR Measures and Outage Types are also available on the Help page as well.

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
 - Engine Generators
- *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.

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- *What kinds of data can be plotted?*
 - There are ten data points included in the online database (for some sites, one or more of the data points may not be available):
 1. DG/CHP Generator Output
 2. DG/CHP Generator Output Demand
 3. DG/CHP Generator Gas Input
 4. Total Facility Purchased Energy
 5. Total Facility Purchased Demand
 6. Other Facility Gas Use
 7. Useful Heat Recovery
 8. Unused Heat Recovery
 9. Status/Runtime of DG/CHP Generator
 10. Ambient Temperature

There are ten data points included in the online database (for some sites, one or more of the data points may not be available):

There are four additional data points that are calculated from database values:

1. Total Facility Energy
2. Total Facility Demand
3. Total CHP Efficiency
4. Electrical Efficiency

Details for the online database can be found in the facility documentation section for a given facility under the "Facilities" tab.

- *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 CSV 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.

- *What are Standardized Reports?*
 - Standardized reports are updated each time new data is made available for the online database. They contain tables and plots that further describe the performance of the CHP System for a given site. There are Monthly and Annual reports available in PDF format, which can be viewed using Adobe Acrobat Reader.

- *What Standardized Reports are available?*
 - There are four types of standardized reports available:
 1. *Generator, Facility, and Meter Power* - contains tables and plots that summarize the Generator power generation and total facility electricity load.
 2. *Generator Status, Gas Use, Heat Recovery, and Facility Gas Use* - displays tables and plots describing the generator runtime, generator and facility fuel consumption and the performance of the heat recovery system.
 3. *Generator Power Quality* - contains tables and plots describing the generator power production including Voltage, Current, Power Factor, Harmonic Distortion and Frequency.
 4. *Facility Meter Power Quality* - contains tables and plots describing the facility power use including Voltage, Current, Power Factor, Harmonic Distortion and Frequency and also compares the facility power characteristics with and without the generator operating.

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. Use either the email address or phone number to contact EEA and request an email be sent to you with your password.
- *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.

OR Reports

- *What are the calculations?*
 - The calculations are done with the data that each site enters once a month, and they produce the OR measures for that site. A list of the OR measures and how they are calculated is available on the support page.
- *What are good values for the OR Measures?*
 - Desirable values for the OR Measures change depending on what measures are being evaluated. For instance, the availability factor and running availability are desired to be as close to 100% as possible, whereas it is desirable to have the forced outage rate and scheduled outage factor as low as possible. In the same way it is advantageous to have the mean time between forced outages high and the mean down time low.

Entering Site Data

- *How do I enter data for my facility?*
 - Each month, both operating data and outage data must be entered for your facility. On the data entry page of the website there are options to enter new data under the sections “Site Operating Data” and “Site Outage Data”. Operating data must be entered for an entire month only once, however outage data must be entered separately for every outage that occurs at your facility.
- *How often should I enter data?*
 - Operating data should be entered at the beginning of each month for the entire previous month, each month requires only one entry. Outage data may be entered at one time for a whole month, or multiple times as each outage occurs.
- *What operating data will I enter?*
 - Under the operating data option, you will enter the month and year of operation, and the number of attempted and successful starts for all units at your facility. Note: you may not enter data for only a single unit when multiple units are present; all units must be entered at the same time.
- *What outage data will I enter?*
 - Under the outage data option, you will need to choose the type of outage from a menu and then enter the start and end time of the outage. For planned outages, no further data is needed, however for forced outages the entry form will prompt you to indicate the system that was effected, the cause, and the corrective action.
- *How can I change data if I have made a mistake?*
 - On the data entry page there are options to change and remove data that was previously entered.
- *Who will be able to see the data I enter?*
 - Only personnel at your facility with the password will be able to see the specific data that you enter, however the summary statistics and OR measures will be able to be seen by anyone who looks at the website.
- *Do I still have to enter data if my unit is not operating?*

- Yes, even if a unit is not operating for an entire month, a reserve outage must be entered.
- *Why can't I enter data for only one unit if I have more than one at my facility?*
 - All units must have data entered every month and this data must be entered at the same time or else an error will occur and ask you for the missing data.
- *What do I do if I accidentally delete data?*
 - If you accidentally delete data that you cannot replace use the contact information on the support page to contact EEA and request assistance.

7. Help / Contact Information

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

Adam Walburger
CDH Energy Corp.
315-655-1063
dgchp_data@cdhenergy.com

For questions concerning the operational reliability portion of the website or the site in general contact:

Anne Hampson
Energy and Environmental Analysis, Inc.
703-528-1900 x320
ahampson@eea-inc.com