

# NYSERDA DER Integrated Data System Data Submission Specification

This document describes the requirements for submitting performance data to Frontier Energy for inclusion in the [NYSERDA Distributed Energy Resources \(DER\) Integrated Data System website \(https://der.nyserda.ny.gov\)](https://der.nyserda.ny.gov).

Direct any questions regarding data submission to [der@frontierenergy.com](mailto:der@frontierenergy.com).

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## File Formats

File formats accepted are CSV or JSON. Descriptions and examples of each of these are given below. For all other file formats, contact Frontier Energy to ensure that your proposed alternative can be received and processed. In general, proprietary file formats requiring dedicated software (e.g., Microsoft Excel XLS) and overly verbose (e.g., XML) files are discouraged. To ensure that data processing is not disrupted, file configurations should not change throughout the duration of reporting.

### CSV Format

The data file shall be a column-oriented text file containing plain ASCII data delimited by commas, equivalent to the comma separated values (CSV) format. The first column shall contain the date-time value corresponding to the data records stored across each row.

Columns must be defined in a header row and/or in a separate file provided to Frontier Energy that describes the contents of the CSV files. The sequence of the columns in the data file must not change. Any additional data columns included after the start of data transmission shall be added to the right-

hand side of the file, as not to change the preceding column contents. Header row(s) shall use the same comma delimiter as the remainder of the file.

An example of this file structure is displayed below.

Date/Time,	kW,	kW,	kW,	kW,	lbs/h,	SCFH,	KPPH,	PSIG,	KPPH,	PSIG
2020-04-26T00:15Z,	3449.64,	178.16,	108.42,	3225.14,	1988.52,	12205.88,	29.80,	167.21,	30.03,	204.30
2020-04-26T00:30Z,	3450.81,	178.03,	108.51,	3229.26,	1993.69,	12026.34,	29.70,	167.01,	29.64,	204.32
2020-04-26T00:45Z,	3449.30,	178.33,	108.92,	3236.78,	2003.20,	11903.56,	29.71,	167.13,	29.81,	204.35
2020-04-26T01:00Z,	3450.60,	178.69,	108.96,	3238.32,	2003.98,	11836.17,	29.60,	167.12,	29.48,	204.33

### JSON Format

JSON file structures are also acceptable and should explicitly declare the data channel and date/time stamp for each individual data point. A simple example is provided below, however many acceptable configurations of the JSON file format will be useable. Frontier will advise on the suitability of the JSON format provided on an individual case basis.

```
[
  {
    "ts":
      [
        "2020-04-26T00:15Z",
        "2020-04-26T00:30Z",
        "2020-04-26T00:45Z"
      ]
    "energy":
      [
        3449.64,
        3450.81,
        3449.30
      ]
    "demand":
      [
        892.16,
        878.03,
        883.43
      ]
  }
]
```

### Filename Convention

To prevent data loss, each data file transmitted shall have a unique filename. The preferred filename format includes a unique site name and the date of data included in the file as such:

```
SiteName_YYYYMMDD_HHMM.csv

SiteName_20170427_0130.csv for data transmitted on April 27, 2017 at 1:30 AM
```

If your reporting system restricts filenames such that this format is not possible, contact Frontier Energy to establish an appropriate alternative.

### Date/Time Stamps

Date/time values shall use numeric dates and 24-hour clock format. The time zone must be clearly indicated, either encoded in the timestamps using ISO 8601 format (e.g., 2020-09-08T15:15Z) (preferred), specified in the header portion of the data file, or in a separate document provided to Frontier Energy. Wherever possible, timestamps should be synchronized to a service such as [NIST Internet Time Service \(ITS\)](#).

For all DER technologies except energy storage, data shall be recorded on a regular interval (e.g., on a 1, 5, or 15-minute basis), with 15-minute data being the preferred interval. Energy storage installations enrolled in demand charge compensation shall provide data at a maximum interval of 15 minutes. Energy storage installations compensated under the VDER Value Stack tariff shall provide data at a maximum interval of 1-hour.

## Variable Definitions

Definitions must be provided for each data variable provided, including the name used in the data file, a description of what it measures and the location of the measurement if applicable, and units. This information can be provided in the header row of a CSV file, within the JSON structure, and/or in a separate data descriptions document.

Column	Header Label	Description	Unit
0	DT	Date/Time (UTC Interval Ending)	UTC Interval Ending
1	WGT	Turbine Generator Real Power	kW
2	WBOP	BOP Auxiliary Load	kW
3	WGC	BOP Gas Compressor Power Usage (Shark Meter)	kW
4	WBOPnet	BOP Net Power	kW
5	FGT	Turbine Fuel Gas Flow (FIT 0101)	lbs/h
6	FDB	HRSG/DB Gas Flow	scfh
7	FS	HRSG Steam Flow (FIT 0208)	kpph
8	PS	HRSG Steam Header Pressure (PIT 0201)	psig
9	FFW	HRSG Boiler Feedwater Flow (FIT 0213)	kpph
10	PFW	HRSG Boiler Feedwater Pressure (PIT 0212)	psig

The data points provided in the file should be sufficient to characterize the performance of the system. A separate Monitoring and Verification Plan (M&V Plan) should be provided that describes the physical location, meter make and model, sensor type, units of measure, and type of data provided (e.g. analog value, discrete pulse count, accumulated energy, etc.). It should also include a diagram indicating the location of each monitoring point provided. This document is a required deliverable for some NYSERDA programs and is highly encouraged for others.

The number and type of measurements required will be unique to each DER site and may change as NYSERDA reporting requirements evolve. More information on measurement points is given in the Monitoring and Data Collection Standard for Distributed Energy Resource (DER) Systems, available at <https://der.nysERDA.ny.gov/resources/data-submissions/>.

## Measurement Sampling

The records in the data file shall consist of an average (or total for discrete data types) of samples in the interval, or an accumulated value recorded at the timestamp. Unless otherwise indicated, it is assumed that the timestamp represents the end of the data collection interval.

The sampling rate for all data points shall be 1-minute or faster. Examples for typical data types are shown below.

<b>Data Type: Analog</b> <b>Example: Power (kW)</b>	<b>Data Type: Discrete Pulse</b> <b>Example: Gas Meter @ 10</b> <b>CF/pulse</b>	<b>Data Type: Accumulator</b> <b>Example: Total Heat Transfer</b> <b>from BTU meter from Modbus</b>
Sample #1 3036.17	Sample #1 0	Sample #1 29000
Sample #2 3049.89	Sample #2 10	Sample #2 29100
Sample #3 3042.13	Sample #3 10	Sample #3 29200
Sample #4 3179.58	Sample #4 10	Sample #4 29300
Sample #5 3082.14	Sample #5 10	Sample #5 29400
Sample #6 3025.41	Sample #6 0	Sample #6 29500
Sample #7 3013.76	Sample #7 10	Sample #7 29600
Sample #8 3030.50	Sample #8 10	Sample #8 29700
Sample #9 3005.48	Sample #9 0	Sample #9 29800
Sample #10 3031.37	Sample #10 0	Sample #10 29900
Sample #11 3121.37	Sample #11 0	Sample #11 30000
Sample #12 3113.59	Sample #12 10	Sample #12 30100
Sample #13 3073.82	Sample #13 10	Sample #13 30200
Sample #14 3495.38	Sample #14 0	Sample #14 30300
Sample #15 3173.88	Sample #15 10	Sample #15 30400
<b>Data Record (avg) 3098.30</b>	<b>Data Record (sum) 90</b>	<b>Data Record (last) 30400</b>

For heat transfer measurements, the corresponding flow rate and temperature data should be provided. The reporting of heat transfer as MBtu or MBtu/h without the corresponding flow and temperature data is highly discouraged.

## Numeric Accuracy

Numeric data entries should have enough significant digits to represent the accuracy of the measurement provided. Unless otherwise indicated, it is assumed that quantity (e.g. kWh, cf) units represent the total quantity measured during the period or an instantaneous reading of cumulative total over all time, and rate (e.g. kW, cfh) units represent the average rate measured during the interval.

## Transmission Protocols

Frontier Energy can accept data over multiple protocols:

- Secure File Transfer Protocol (sFTP/FTP over SSH)
- File Transfer Protocol Secure (FTPS/FTP-SSL)
- Hypertext Transfer Protocol Secure (HTTPS)
- Email (not secure)

Secure data transmission protocols are preferred. While we accept email transmission, it is not encrypted and is therefore not a recommended data submission method.

Method	Details
<b>sFTP/FTP over SSH</b> <b>FTPS/FTP-SSL</b>	Contact <a href="mailto:der@frontierenergy.com">der@frontierenergy.com</a> to request credentials for data transfer. Credentials will be unique to each DER site submitting data.
<b>HTTPS</b>	Transfer is currently limited to receiving data from certain data loggers (Obvius and eGauge) or Frontier Energy pulling data from certain data providers' API. Contact Frontier Energy to inquire about adding new API sources.
<b>Email</b>	Send emails to <a href="mailto:data_collection@frontierenergy.com">data_collection@frontierenergy.com</a> . The subject line should be consistent over time and contain a unique identifier for the project.

For any of the above transmission methods, inform Frontier Energy once the first file has been sent so that data receipt can be confirmed, and data acceptance protocols can be configured.

## Scheduling Automated Transmissions

The NYSERDA DER Integrated Data System operates in a “store and forward” manner. Therefore, data must be provided on a regular, automated basis, with data transmitted from the DERs at a minimum of once per day. Excessive transmission of data (e.g., every 15-minutes) should be avoided if possible. Daily data transfers to Frontier Energy servers shall be scheduled to between 12:00 midnight and 3:00 AM. Data is processed and pushed to the NYSERDA DER Integrated Data System website twice a day. Data submitted after 9:30 am EST will be processed automatically by the following day.

## Skipped Submissions

If data submission is interrupted for any reason, or if any changes are made to the format of the data submission, it is the responsibility of the data provider to contact Frontier Energy so data can be restarted or added while ensuring data continuity.

## Alternatives and Exceptions

This document describes the minimum requirements for data submittal. Alternatives or exceptions must be reviewed by Frontier Energy prior to data acceptance.