

HOURLY AND DAILY BALANCING AUTHORITY OPERATIONS REPORT DATA FORMAT AND TRANSMITTAL INSTRUCTIONS EIA-930

PURPOSE

The purpose of this data collection is to provide basic operating information about the nation's electric power system on a current and historical basis. While regional transmission organizations and electric utilities have primary responsibility for electric system operations, many other entities, such as industry participants, policymakers, legislators, regulators, emergency and disaster response officials, entrepreneurs, economic analysts, industry researchers, and the public, have a direct interest in electric system operations and the associated data. This collection provides a centralized and comprehensive source for hourly electric industry operating data.

QUESTIONS

If you have questions about this U.S. Energy Information Administration (EIA) data collection, please contact the EIA Customer Care Center at 1-855-EIA-4USA (1-855-342-4872) or by email to eia4usa@eia.gov.

REQUIRED RESPONDENTS

All entities in the contiguous United States that are listed in the North American Electric Reliability Corporation's (NERC's) Compliance Registry as a balancing authority must submit information as required by this data collection.

Registered balancing authorities that are parties to the coordinated functional registration agreement JRO00001 are required to jointly submit for the Midcontinent Independent System Operator (MISO).

PERIODIC INFORMATION UPDATES

At the beginning of each year, respondents will receive an email asking them to verify 1) contact information, 2) a list of directly, physically connected balancing authorities, 3) if applicable a list and description of demand sub-regions (a system map specifying the sub-regions is sufficient), and 4) a description of their submission method.

Additionally, respondents are required to inform EIA via email to eia4usa@eia.gov of any change in their submission process or the information listed in the previous two paragraphs at least seven business days prior to the effective date of the change.

RESPONSE DUE DATE AND TIME

Data is to be submitted in two files: "same-day" and "daily" files.

Same-day files are to be submitted hourly, no later than within 60 minutes of the end of the operating hour. Respondents may

voluntarily submit their hourly data within 30 minutes of the end of the operating hour. Respondents who are "generation-only" balancing authorities are not required to submit the same-day file.

Daily files are to be submitted daily by 7:00 a.m. Eastern Prevailing (Standard or Daylight Saving) Time. The daily files are to remain available at the posting location for one year.

HOW TO SUBMIT

Same-day and daily file submissions are to be made using EIA's standard XML or CSV file format (see FILE LAYOUT).

Respondents can transmit their data using one of two methods: post files to a respondent-specified Internet website or submit the files to a secure EIA-designated website. Please provide to EIA the URL and any access instructions for the respondent-specified website. Respondents may, at their discretion, provide the public with access to the posted files at their Internet address.

As an alternative, respondents may arrange with EIA to set up automated file retrieval using business-to-business data transfer or web services technology. Contact EIA to discuss.

DATA COLLECTION INSTRUCTIONS

GENERAL

Report all data as hourly integrated values in megawatts by hour ending time. Round all reported megawatt data to the nearest integer.

Report hourly date-time stamps using the Coordinated Universal Time (UTC) that correlates with the respondent's local time. For example, the date-time stamp for March 1, 2017, hour ending 1:00 AM Eastern Standard Time (with UTC Offset = 5) should be reported as:

2017-03-01T06:00:00.000Z.

FILENAMES

Same-day files: Use the following filename format, which will remain the same for every hourly submission and will not change from day-to-day or hour-to-hour:

"XX[X][X]samedaydemand.xml or .csv"

where XX[X][X] is the respondent's Balancing Authority Code (see DATA DEFINITIONS). An example filename using MISO is:

"MISOsamedaydemand.xml" or "MISOsamedaydemand.csv"

Daily files: Use the following filename format:

"XX[X][X]dailyDDDDYYYY.xml or .csv"

where XX[X][X] is the respondent's Balancing Authority Code (see DATA DEFINITIONS) and DDDDDYYYY is the day-of-year date that is the file's original required submission date. An example filename using MISO's daily file submission for March 1, 2017 is:

"MISOdaily0602017.xml" or "MISOdaily0602017.csv"

DATA FILE CONTENTS

Same-day files should contain:

- Hourly total actual demand for each hour up to and including the most recent operating hour of the day
- Corresponding hourly UTC date-time stamps

A single file should be used for the hourly same-day submissions with a standard filename as specified in the FILENAMES section.

A new hourly value and date-time stamp should be added to the file each hour for the most recent operating hour. In the case of the first posting of each day (submitted between 12:00-12:30 a.m. respondent's local time), the same-day file will contain demand values for the full set of hours for the previous day. In the next hour's posting (submitted between 1:00-1:30 a.m. respondent's local time), the same-day file will only contain the demand value for the first hour of the current day (hour ending 1:00 a.m. respondent's local time); the previous day's values are dropped.

Daily files should contain:

- Yesterday's hourly day-ahead demand forecast for today
- Yesterday's hourly total actual demand
- *In certain circumstances:*

Yesterday's hourly total actual demand known to be used to store energy

*(This information is **only required** by respondents that are unable to account for electricity known to be used to store energy as described the **Data Type "D"** section of the instructions.)*

- Yesterday's hourly total net generation
- Yesterday's hourly net generation by energy source
- Yesterday's hourly total net metered tie line flow
- Two-days-prior-to-today's hourly net metered tie line flow with each directly, physically connected balancing authority
- As soon as available, within one month after the operating day, hourly actual demand by sub-region*
- Corresponding hourly UTC date-time stamps

A single file should be produced each day for the daily submission with a standard filename as specified in the FILENAMES section. The daily files are to remain available at the posting location for one year.

*Respondents that calculate hourly actual demand values for sub-regions within the tie line boundaries of their system (e.g., local balancing authorities, areas, zones, operating companies, etc.) in the normal course of business within one month of the operating day are required to report these values. If reporting demand by sub-region, please provide to EIA information about these sub-regions in advance (see PERIODIC INFORMATION UPDATES).

FILE LAYOUT

Example XML and CSV files are available on the [EIA Website](#). Please refer to the XML and XML schema example files for the XML file layout and structure.

The CSV file layout for both the same-day and daily files should contain a header row with these fields:

Product Name, Posting Type, Balancing Authority Code, Data Type, Data Code, Data Date, UTC Offset, HR1, HR2, HR3, HR4, HR5, HR6, HR7, HR8, HR9, HR10, HR11, HR12, HR13, HR14, HR15, HR16, HR17, HR18, HR19, HR20, HR21, HR22, HR23, HR24, HR25

DATA DEFINITIONS

Please report the following information for each field. See the DATA QUALITY section for more discussion of the relationship between various data elements.

Product Name: This is a standard required field. Please use "EIA-930" as the value.

Posting Type: This is a standard required field. Use "Same-Day" for the same-day file and use "Daily" for the daily file

Balancing Authority Code: This is the balancing authority's two to four character ID code used to uniquely identify balancing authorities in the industry's e-tag interchange scheduling system. A current list of balancing authorities and their e-tag ID codes is provided on the [EIA Website](#).

Data Type: This field is used to specify the type of record being reported.

Note: electricity from the system that is known to be used to store energy should be excluded from demand (D) and included as a negative contribution to net generation (NG). Only respondents that are unable to account for energy storage in this way are required to report data type "DS"

UTC0 = the hourly UTC date-time stamps corresponding with the hourly data for the current day (i.e., the reporting day). This is reported on both the same-day and daily files.

UTC1 = the hourly UTC date-time stamps corresponding with the hourly data for the day prior to the reporting day.

UTC2 = the hourly UTC date-time stamps corresponding with the hourly data for the day two days prior to the reporting day.

UTCD = the hourly UTC date-time stamps corresponding with the hourly demand by sub-region data. This should only be used if reporting demand by sub-region. (Report UTCD separately even if it is the same date as UTC1 or UTC2.)

DF = day-ahead demand forecast. This value should always be positive.

D = actual demand. This value should always be positive. This is reported on both the same-day and daily files.

For hours when electricity from the system is known to be used to store energy (via pumped storage, batteries or other energy storage devices), this electricity should be excluded from the actual demand reported on Form EIA-930 and instead be included as a negative contribution to net generation. Respondents that are unable to account for electricity known to be used to store energy this way should instead report the hourly electricity from the system that was known to be used to store energy using data code "DS".

DS = reported actual demand known to be used to store energy. *This field is **only required** by respondents that are unable to account for electricity known to be used to store energy as described in the previous paragraph.*

In cases when electricity from the system is known to be used to store energy (via pumped storage, batteries or other energy storage devices), but cannot be excluded from the actual demand reported on Form EIA-930, report the hourly electricity from the system that was known to be used to store energy using data code "DS".

NG = net generation. This value should usually be positive. However, negative values may be reported for hours when there is net energy storage. Also station use for a generation-only balancing authority that exceeds gross output will yield negative net generation.

In cases when electricity from the system is known to be used to store energy (via pumped storage, batteries or other energy storage devices) this electricity should be excluded from the actual demand reported on Form EIA-930 and instead be included as a negative contribution to net generation.

Load resources acting as "generation" by agreeing to reduce load in exchange for financial compensation should not be included in the reported net generation.

FLOW = net metered tie line flow. This value can be positive or negative. Positive net flows indicate that the electricity is flowing out of the respondent's balancing authority. Negative net flows indicate that the electricity is flowing into the respondent's balancing authority.

Data Code: This field is used to further specify the data being reported for Data Types "D," "NG," and "FLOW." Except as noted below, all Data Codes pertain to the daily file only.

For Data Type "D"

Use "SYS" when reporting total actual demand (on both the daily and same-day files)
Use "YY[Y][Y]" respondent-specified sub-region codes when reporting demand by sub-region

For Data Type "NG"

Use "SYS" when reporting total net generation
Use "ZZ[Z]" codes below when reporting net generation by energy source:

COL – coal
NG – natural gas
NUC – nuclear
OIL – all petroleum products
WAT – hydro (excluding pumped storage*)
PS – pumped storage
SUN – solar without integrated battery storage
SNB – solar with integrated battery storage
WND – wind without integrated battery storage
WNB – wind with integrated battery storage
BAT – battery storage
OES – other energy storage
GEO – geothermal
OTH – all other energy sources
UNK – unknown

***Hydro:** If pumped storage cannot be distinguished from conventional hydroelectric generation then combine the two energy sources and report as WAT. In cases of combined reporting: for hours when storage exceeds generation, report the net storage as a negative net generation for the hour; for hours when generation exceeds storage, report the net generation as a positive net generation for the hour.

Pumped storage: For hours when pumped storage units store more electricity than they generate, report the net storage as a negative net generation for the hour. For hours when pumped storage units generate more electricity than they store, report the net generation as a positive net generation for the hour.

Batteries: For hours when batteries or other energy storage devices store more electricity than they generate, report the net storage as a negative net generation for the hour. For hours when batteries or other energy storage devices generate more electricity than they store, report the net generation as a positive net generation for the hour.

Dual-fuel or multiple fuel generators: For dual-fuel generators (which can switch from one fuel to another), use the energy source code for the actual fuel used if known, otherwise use the energy source code for the primary fuel of the generator. For multiple fuel generators (which can use multiple fuels simultaneously), use the energy source codes to report generation from each fuel used if known, otherwise use the energy source code for the primary fuel of the generator for the entire amount of generation.

Unknown: For dual-fuel or multiple fuel generators do not report the energy source as unknown. See the guidance above for reporting dual-fuel or multiple fuel generators.

Total Net Generation: For hours when storage devices such as pumped storages or batteries store more electricity than the entire system generates, report the net storage as a negative net generation for the hour. For hours when storage devices such as pumped storages or batteries store less electricity than the entire system generates, report net generation as a positive net generation for the hour.

Confidentiality requirements: In cases where there are 3 or fewer generators in an energy source category, and tariffs or other agreements require this information to be masked, use the "other" category ("OTH") for this generation.

For Data Type "FLOW"

Use "SYS" when reporting total net metered tie line flow
 Use "XX[X][X]" balancing authority codes for the receiving/supplying balancing authority when reporting net metered tie line flow with directly, physically connected balancing authorities.

Data Date: Report the local date associated with the data being reported using the day-of-year (DDYYYY) format. For the same-day file, the Data Date will be the day that is currently being reported in the file. For the daily file, the Data Date will differ for each Data Type reported in the file.

For example, in the daily file submission for March 1, 2015 (0602015), the Data Dates would be:

- 0602015 for UTC0 and DF
- 0592015 for UTC1, D-SYS, DR, NG-SYS, NG-ZZ[Z], and FLOW-SYS
- 0582015 for UTC2, FLOW-XX[X][X]
- For UTC0 and D-YY[Y][Y], it will depend on the respondent's timing of reporting this data

UTC Offset: Report a value between 4 and 8 that represents the difference between UTC time and the respondent's local time. Use the reference table below to determine the UTC offset.

COORDINATED UNIVERSAL TIME (UTC) OFFSET

| U.S. Time Zones | Standard Time | Daylight Savings Time |
|-----------------|---------------|-----------------------|
| Eastern | 5 | 4 |
| Central | 6 | 5 |
| Mountain | 7 | 6 |
| Pacific | 8 | 7 |

Note: When reporting data for the second Sunday in March when Standard Time turns to Daylight Saving Time, use the UTC offset for Daylight Saving Time. And when reporting data for the first Sunday in November when time turns from Daylight Saving Time to Standard Time, use the UTC offset for Standard Time. Refer to the daily and same-day examples of the time change transitions on the [EIA Website](#).

HR#: Represents fields for reporting one value for each sequential hour of the day in respondent's local time (e.g., HR5 is hour ending 5 a.m.). HR25 field is always included in the file layout but should only be used to report data for the first Sunday in November when time turns from Daylight Saving Time to Standard Time resulting in a 25th hour on that date. On the second Sunday in March when Standard Time turns to Daylight Saving Time, HR24 will be blank because there will only be 23 hours of data to report.

EXAMPLE OF REPORTING ENERGY STORAGE

EXAMPLE 1:

Consider the following scenario where a reporting entity has a solar generating resource and an **unintegrated** battery storage. Suppose the solar resource generates 20 MWh of electricity in an hour, 3 MWh of the generated electricity is used to charge the battery, 12 MWh of load is served by the reporting entity (in addition to the 3 MWh used to charge the battery), and 5 MWh is exported to a neighboring balancing authority.

In this scenario,

- Net generation (NG) should be reported as **17 MWh** (20 MWh generated minus 3 MWh used for energy storage)
- Demand should be reported as **12 MWh** (do not include the 3 MWh of electricity used for energy storage)
- Net metered tie line flow (FLOW) should be reported as **5 MWh**.
- Reported actual demand known to be used to store energy (DS) should be **omitted** from reporting
- Solar generation (Data Code SUN) should be reported as **20 MWh**
- Battery generation (Data Code BAT) should be reported as **-3 MWh**

Respondents unable to account for electricity known to be used to store energy as illustrated above, may alternatively report as follows:

- Demand may be reported as **15 MWh** (12 MWh of traditional load plus 3 MWh of electricity used for energy storage)
- Net generation (NG) may be reported as **20 MWh** (The full 20 MWh of generation is reported if energy storage cannot be excluded minus 3 MWh used for energy storage)
- Net metered tie line flow (FLOW) should be reported as **5 MWh**.
- Reported actual demand known to be used to store energy (DS) may be reported as **3 MWh**.
- Solar generation (Data Code SUN) should be reported as **20 MWh**
- Battery generation (Data Code BAT) may be **omitted**

EXAMPLE 2:

Consider the following scenario where a reporting entity has a solar generating resource and an **integrated** battery storage. Suppose the solar resource generates 20 MWh of electricity in an hour, 3 MWh of the generated electricity is used to charge the integrated battery, 12 MWh of load is served by the reporting entity (in addition to the 3 MWh used to charge the battery), and 5 MWh is exported to a neighboring balancing authority.

In this scenario,

- Net generation (NG) should be reported as **17 MWh** (20 MWh generated minus 3 MWh used for energy storage)
- Demand should be reported as **12 MWh** (do not include the 3 MWh of electricity used for energy storage)
- Net metered tie line flow (FLOW) should be reported as **5 MWh**.
- Reported actual demand known to be used to store energy (DS) should be **omitted** from reporting
- Solar generation with integrated battery storage (Data Code SNB) should be reported as **17 MWh**

Respondents unable to account for electricity known to be used to store energy as illustrated above, may alternatively report as follows:

- Demand may be reported as **15 MWh** (12 MWh of traditional load plus 3 MWh of electricity used for energy storage)
- Net generation (NG) may be reported as **20 MWh** (The full 20 MWh of generation is reported if energy storage cannot be excluded minus 3 MWh used for energy storage)
- Net metered tie line flow (FLOW) should be reported as

5 MWh.

- Reported actual demand known to be used to store energy (DS) may be reported as **3 MWh**.
- Solar generation (Data Code SUN) may be reported as **20 MWh**
- Battery generation (Data Code BAT) may be **omitted**

DATA QUALITY

Expected data revisions: When respondents cannot report finalized data by the due date and time, they should submit their best estimates on schedule and correct the data with a resubmission within 3 days or as soon as the actual data is available. For example if the initial reporting of total net metered tie line flow needs to be revised because of adjustments made during the check-out process with neighboring balancing authorities, then a new daily files should resubmitted. In cases where changes are routinely made respondents should make arrangements with EIA to schedule a regular resubmission process.

Unexpected data revisions: When unexpected reporting errors exceed 10 MWh for any hour, resubmit corrected data to address the imbalance within 30 days. If such corrections cannot be made within 30 days, respondents should make arrangements with EIA to discuss an alternative resubmission timeline.

Energy balance: The values reported for total actual demand, total net generation, and total net metered tie line flow are expected to balance hourly (i.e., the sum of demand and net metered tie line flow is expected to equal net generation).

For hours when electricity from the system is known to be used to store energy (via pumped storage, batteries or other energy storage devices), the energy balance relationship should also continue to balance. In such hours the actual demand value should have been lowered by the amount of electricity consumed for storage purposes and a corresponding negative contribution should have been reflected in the reported net generation.

Demand forecast: If you do not produce a day-ahead demand forecast in the normal course of business that is directly comparable to actual demand as defined for this collection (see discussion of physical vs. commercial operations below), you are not required to produce a consistent demand forecast for the purposes of EIA-930 reporting. Please report the day-ahead demand forecast generated in the normal course of business.

Demand: To the extent possible, the sum of the values reported for actual demand by sub-region is expected to equal reported total actual demand each hour. Where discrepancies exist due to different methods for calculating these two data elements, please provide a short description of the methods used.

Net generation: To the extent possible, the sum of the values reported for net generation by energy source is expected to equal reported total net generation each hour. Where discrepancies exist due to different methods for calculating these two data elements, please provide a short description of the methods used.

Net metered tie line flows: To the extent possible, the sum of the values reported for net metered tie line flow with each directly,

physically connected balancing authority is expected to equal reported total net metered tie line flow each hour. Where discrepancies exist due to different methods for calculating these two data elements, please provide a short description of the methods used.

Reported net metered tie line flow with each directly, physically connected balancing authority is expected to match that reported by the corresponding balancing authority.

Anomalous data: Please suppress anomalous data values such as erroneous zero and large positive or negative values in same-day files. Submit the same-day file on schedule with the appropriate date-time stamp for the reporting hour, but leave the demand value blank. Replace the blank demand value with a valid value as soon as possible in subsequent same-day file submissions. Do not report zeros for any energy values unless they are valid zeros.

Please suppress anomalous data values such as erroneous zero and large positive or negative values in daily files. Submit the daily file on schedule with the appropriate date-time stamp for the reporting hour, but leave the energy value blank. Replace the blank with a valid value as soon as possible and resubmit the daily file. Do not report zeros for any energy values unless they are valid zeros.

Physical vs. commercial operations: With the EIA-930 data collection EIA is attempting to represent electric system operations in as purely a physical way as possible. Ownership and dispatch are irrelevant to the determination of what is associated with a balancing authority.

Therefore, dynamic transfer arrangements implemented as either pseudo-ties or dynamic schedules are to be ignored in or excluded from reporting, meaning that metered tie line flows are not to be adjusted and actual demand and net generation should reflect only demand and net generation occurring within the physical tie line boundaries of the balancing authority.

Generators physically embedded within the tie line boundary of your balancing authority, but owned, operated, or dispatched by another balancing authority, are to be included, for the purposes of the EIA-930, in your reporting of net generation. The transmission connection of that plant to your system is not considered to be a tie line boundary.

Similarly, if your balancing authority is supplied from a generator that is owned, operated, or dispatched by you, but is located outside the tie line boundary of your balancing authority, it is not to be included, for the purposes of the EIA-930, in the reporting of your net generation. The transmission connection(s) of isolated plants physically embedded within the tie line boundary of another balancing authority is not considered to be a tie line boundary.

Ultimate customer load that is physically embedded within the tie line boundary of your balancing authority, but is supplied by another balancing authority, is to be included, for the purposes of the EIA-930, in your reporting of actual demand. The transmission connection of that load area to your system is not considered to be a tie line boundary.

Similarly, if your balancing authority supplies electricity to ultimate customer load outside the tie line boundary of your balancing authority, it is not to be included, for the purposes of the EIA-930, in the reporting of your actual demand. The transmission connection(s) to load areas within the tie line boundary of another balancing authority is not considered to be a tie line boundary.

If ultimate customer load is supplied through your system and the load area is not physically embedded in another balancing authority, include that load in your actual demand, even though you consider the load area outside your metered tie line boundary.

In situations where it is not possible or practical to exclude all dynamic transfer arrangements implemented as either pseudoties or dynamic schedules in the reporting of generation, demand, and interchange, then it is the responsibility of the impacted balancing authorities to reach an agreement with their counterparts on a consistent reporting of generation, demand, and interchange. Any such agreements between balancing authorities should be communicated to EIA. To simplify the implementation of these agreements and to reduce the burden of all parties involved, EIA encourages balancing authorities to consider using other existing industry conventions that may already be in place. Once an agreement has been communicated to EIA, none of the impacted balancing authorities should alter that reporting agreement without mutual agreement of all impacted balancing authorities.

SANCTIONS

The timely submission of Form EIA-930 by those required to report is mandatory under 15 U.S.C. §772(b), as amended. Failure to respond may result in a civil penalty of not more than \$10,633 each day for each violation. The government may bring a civil action to prohibit reporting violations which may result in a temporary restraining order or a preliminary or permanent injunction without bond. In such civil action, the court may also issue mandatory injunctions commanding any person to comply with these reporting requirements.

Title 18 U.S.C. §1001 makes it a criminal offense for any person knowingly and willingly to make to any Agency or Department of the United States any false, fictitious, or fraudulent statements as to any matter within its jurisdiction.

In the case of the EIA-930, EIA will not pursue sanctions if mechanical failure or other factors beyond the control of the respondent cause a failure to report.

DISCLOSURE OF INFORMATION

All information reported on Form EIA-930 is public information and may be publicly released in company identifiable form.

FISMA REQUIREMENTS

In order to comply with the requirement of the Federal Information Security Modernization Act of 2014 (FISMA), an Interconnection Security Agreement (ISA) may need to be signed if either (1) data is submitted to EIA using an automated business-to-business data transfer or web services technology or (2) data is posted to a respondent-specified Internet website that requires access with a user name and password.

REPORTING BURDEN

Public reporting burden for this collection of information is estimated as an annual average to be 80 hours per respondent, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and

completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Energy Information Administration,

Office of Survey Development and Statistical Integration, E-21 Forrestal Building, 1000 Independence Avenue S.W., Washington, D.C. 20585-0670; and to the **Office of Information and Regulatory Affairs, Office of Management and Budget**, Washington, D.C. 20503. A person is not required to respond to the collection of information unless the form displays a valid OMB number.