

Hourly Energy Settlement

Virginia Electric and Power Company (Dominion Energy), as the Electric Distribution Company (EDC) in the Dominion Zone, has the responsibility for collecting and reporting load data to PJM. This load data is used by PJM to settle charges for Load Serving Entities (LSEs) within Dominion's Zone that participate in PJM's Energy Market.

PJM operates a two settlement Energy Market referred to as Settlement A and Settlement B.

Settlement A is the initial estimate of hourly load that is reported to PJM two business days after the fact for each LSE. This settlement is created by associating actual and estimated metered load with losses to the Dominion Zone's system load.

Dominion Energy submits Settlement A to PJM InSchedule using the following PJM deadlines:

<u>Load Settlement Day</u>	<u>PJM InSchedule Deadline</u>
Monday	4 PM Wednesday
Tuesday	4 PM Thursday
Wednesday	4 PM Friday
Thursday	4 PM Monday
Friday	4 PM Tuesday
Saturday	4 PM Tuesday
Sunday	4 PM Tuesday

Settlement B produces an hourly difference for each LSE between the initial Settlement A and final Settlement B loads. This settlement is submitted to PJM 60-days following the end of the calendar month.

The Hourly Energy Settlement, for both Settlement A and Settlement B is determined by the summation of the following:

- The sum of **Non-Interval meter** customers **Class Profiles** +
- The sum of **Interval meter** customers +
- **Line Loss** +
- **Unaccounted for Energy**

Description of the preceding terms:

- **Non-Interval Meters** record the total kWhs and, where applicable, the highest kW demand measured over a 30-minute period, for a billing cycle. There is no record of the amount of load on an interval basis.
- **Class Profiles** are for a group of customers that have a similar kWh usage pattern. Since historical hourly interval data is not available for Non-Interval Meter customers, Class Profiles have been developed from a sampling of survey meters installed for load research purposes. The sum of the hourly load values in a Class Profile is the representative total kWh for the average customer that fits that Class Profile. Each Non-Interval Meter customer is assigned to a Customer Class load profile.

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- **Interval Meters** record the kWhs on an interval basis and are used to determine the hourly load values and total kWhs for the billing cycle. Since there is a historical record of hourly load data for Interval Meter customer, each one is assigned its own historical load data as its own Class Profile.
- **Line Loss** grosses load up to reflect transmission and distribution line energy losses. The Line Loss factor is based on service voltage level.
- **Unaccounted for Energy (UFE)** is the residual between the hourly Dominion Zone system load and the sum of all customer loads. This value can consist of energy diversion, meter error, rounding differences, line loss, or theft. UFE is only allocated to the Non-Interval Meter customers since Class Profile loads are used to estimate the Customers' hourly loads.

Settlement A Process

1) Calculate LSE Non-Interval Meter Customer Class Usage Factor

The LSE Non-Interval Meter Customer Class Usage Factor is based on the average billing cycle kWh per Customer in the Customer Class. The Non-Interval Meter Customer Class Average Usage Factor is calculated by dividing the Customer's historical average billing cycle kWh by the Class Profile kWh for the respective billing cycle.

$$\text{LSE Non-Interval Meter Customer Class Usage Factor} = \frac{\text{Average Non-Interval Meter Customer Billing Cycle kWh}}{\text{Class Profile kWh}}$$

Where: Average Non-Interval Meter Customer Billing Cycle kWh = Total Non-Interval Meter Customer Class kWh for Customer Meters Read for the Applicable Billing Cycle / Total Number of Customer Meters Read in the Non-Interval Meter Customer Class for the Applicable Billing Cycle

Resulting Usage Factors from the above billing cycle, Customer Class, and LSE-specific calculations are averaged together to determine the overall average Usage Factor for the LSE and Customer Class.

2) Calculate Unreconciled LSE Customer Class Hourly Loads

To calculate the Unreconciled LSE Non-Interval Meter Customer Class Hourly Loads, the weather-adjusted Class Profile load is multiplied by:

- a. the LSE Non-Interval Meter Customer Class Usage Factor
- b. the applicable Loss Expansion Factor
- c. the Number of LSE Enrollments in the Customer Class

$$\text{Unreconciled LSE Non-Interval Meter Customer Class Hourly Loads} = (\text{Class Profile Loads} * \text{LSE Non-Interval Meter Customer Class Usage Factor} * \text{Loss Expansion Factor}) * \text{Number of LSE Enrollments}$$

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To determine the LSE Interval Meter Hourly Loads, the actual hourly load is multiplied by the applicable Loss Expansion Factor.

$$\text{LSE Interval Meter Customer Class Hourly Loads} = \text{Actual Hourly Loads} * \text{Loss Expansion Factor}$$

To determine the Unreconciled LSE Hourly Loads, the sum of all Unreconciled Non-Interval Meter Customer Class Hourly Loads is added to the sum of all Interval Meter Customer Class Hourly Loads, by hour, for each LSE in the Dominion Zone.

3) Reconciliation of LSE Hourly Loads

a. Determine Dominion Zone Hourly Loads

Dominion Zone Hourly Loads are reported electronically by PJM via PowerMeter and represent the total of all energy in the Zone, both generated and net zone interchange, for each hour. Dominion Energy is responsible for determining the LSEs' portions of the Dominion Zone PowerMeter. PJM settles all energy transactions in the Energy Market to each load Zone, thus the need to reconcile all LSE hourly loads to Dominion Zone Hourly Loads.

$$\text{Dominion Zone Hourly Loads} = \text{Dominion Zone Generation MWH} + \text{Dominion Zone Net Metered Interconnection Ties MWH}$$

b. Determine Unreconciled Dominion Zone Hourly Loads

All Unreconciled LSE Hourly Loads for the Dominion Zone from Step 2 are summed for each hour to determine the Unreconciled Dominion Zone Hourly Loads.

$$\text{Unreconciled Dominion Zone Hourly Loads} = \text{Sum of All Unreconciled LSE Hourly Loads}$$

c. Determination of the LSE Hourly Load Reconciliation Adjustment

The LSE Hourly Load Reconciliation Adjustment, also known as UFE, is the difference between the Dominion Zone Hourly Loads and the Unreconciled Dominion Zone Hourly Loads.

$$\text{Dominion Zone Hourly Load Reconciliation Adjustment} = \text{Dominion Zone Hourly Loads} - \text{Unreconciled Dominion Zone Hourly Loads}$$

d. Allocation of UFE

UFE is allocated based on the LSE's Non-Interval Meter Customer load ratio share of the Dominion Zone total Non-Interval Meter Customer loads. To calculate the allocation ratios, Interval Meter Customer load is removed from both the LSE Hourly Loads and the Dominion Zone Hourly Loads.

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$$\text{LSE Hourly UFE Allocation Ratio} = \frac{\text{LSE Non-Interval Meter Customer Class Hourly Loads}}{\text{Dominion Zone Total Non-Interval Meter Customer Class Hourly Loads}}$$

$$\text{LSE Hourly Load UFE Adjustment} = \text{Dominion Zone Hourly Load Reconciliation Adjustment} * \text{LSE Hourly UFE Allocation Ratio}$$

$$\text{Reconciled LSE Non-Interval Meter Hourly Loads} = \text{Unreconciled LSE Non-Interval Meter Hourly Loads} + \text{LSE Hourly Load UFE Adjustment}$$

- e. Calculate the LSE Hourly Energy Usage

The LSE hourly energy usage is the sum of the LSE's Reconciled Non-Interval Meter Customer hourly loads and the Interval Meter Customer hourly loads.

$$\text{LSE Hourly Energy Usage} = \text{Reconciled LSE Non-Interval Meter Hourly Loads} + \text{LSE Interval Meter Customer Hourly Loads}$$

Settlement B Process

For Settlement B, aggregate hourly load schedules are produced using the most current Interval Meter and Non-Interval Meter customer load data and appropriate Class Profiles. Dominion Energy uses the methodology described above to determine LSE hourly energy usage for Settlement B. The hourly load differences between Settlement A and Settlement B are then reported to PJM via InSchedule.