Contents

7.0 Metering

Detroit Edison is responsible for determining all required electrical quantities needed for billing Detroit Edison charges to customers and suppliers. Generally, such a determination is made by actual measurements. In instances where this determination is not practical, quantities may be derived through calculation.

Metering is an integral part of the distribution system and is usually provided at the point where the end-use customer takes delivery of the energy. Such metering is essential for billing for electric service, preventing unauthorized use of electricity, and for determining distribution capacity requirements, as well as marketer settlement calculations.

Detroit Edison owns, installs, reads, and maintains all metering equipment for electric choice customers in its service territory. This includes meters, current transformers and voltage transformers, data recorders, and any other equipment necessary for accurate electrical quantity measurement and for efficient metered data retrieval. The metering equipment will be effectively integrated with the rest of the service equipment to provide for safe, cost-effective, and reliable performance.

7.1 Metering Function

The function of metering equipment is to provide all determinants required to calculate the bill for electric choice service.

7.1.1 Billing Determinants for Delivery Charges

The metered quantities required for calculating delivery charges are specified in Appendix B, Retail Access Service Tariff. The metered quantities are:

- Usage, in kilowatthours, recorded in 30-minute intervals.
- Total usage, in kilowatthours, for the entire billing period.
- Reactive energy usage, in kilovarhours, recorded in 30-minute intervals.
- Total reactive energy usage in kilovarhours for the entire billing period .

In all cases, the 30-minute interval begins on the hour or on the half-hour and is labeled using the interval end time. These recorded quantities are used to derive the billing determinants needed to calculate the delivery charges (maximum kW demand, coincident reactive kilovolt ampere demand, etc).

7.1.2 Billing Determinants for Alternative Electric Supplier Energy Charges

Current Detroit Edison billing determinants are available to an alternative electric supplier for calculating energy charges for its customers. For an alternative electric supplier who elects to have Detroit Edison provide complete billing as described in Chapter 6, the billing determinants will be transmitted to the Detroit Edison billing system which calculates delivery charges on its own behalf and energy charges on behalf of each alternative electric supplier. For an altenative electric supplier who elects to bill its own customers for energy charges (separate billing), Detroit Edison will forward billing determinants to the alternative electric supplier via EDI. In either case, the readings are collected on a meter read schedule determined by Detroit Edison, as illustrated in Appendix L, Industrial and Three-Phase Large Commercial Customers Meter Read Dates, and Appendix M, Meter Read Schedule Single-Phase Small Commercial and Residential Customers.

If an alternative electric supplier uses billing determinants that require additional calculations or additional metering equipment beyond that normally provided by Detroit Edison, such determinants or equipment may be provided for a fee to be determined at the time such additional service is requested. Detroit Edison reserves the right to decline to provide such a service if it deems it to be impractical.

7.1.3 Billing Determinants for Marketer Reconciliation and Settlement

The metering provided at the customer locations records energy usage on an hourly basis for the purpose of determining transmission and ancillary service charges and reconciling any energy imbalances with each respective marketer. Detroit Edison will determine and publish the schedule for collecting the metered data.

For residential customers and non-residential customers served by single-phase secondary services, Detroit Edison waives the requirement for interval meters. Instead, Detroit Edison will use statistical methods (load profiling) to distribute on an hourly basis the total energy used by each profiled customer during the billing period. Acceptance of such a waiver will require each customer and its marketer to agree to certain conditions described in Section 7.5.3. If these conditions are not acceptable, the customer may request installation of an hourly meter, in which case the charge shown for the commercial secondary customer class of the Retail Access Service Tariff applies.

7.2 Meter Installation

The metering installations for electric choice customers must include a meter capable of providing all the required determinants and capable of being interrogated by telephone. In the event the metering installation of a customer wishing to participate in electric choice does not meet these requirements, the installation will have to be upgraded. The upgrade work will require participation by both Detroit Edison and the customer and should follow the process described in this section.

Appendix R, Typical Metering Installations for Electric Choice Locations, provides additional detail, including schematic diagrams, relative to these installations. Customers will not be transferred to electric choice until the metering installation has been upgraded to meet all these requirements. For most installations, the service equipment, such as the meter enclosure or cabinets, will be capable of accepting the required kilowatthour meter, and the only upgrade required will be the installation of a telephone line and a replacement meter. If the service equipment has to be upgraded, the customer will need to obtain a qualified electrician who will perform this work according to the specifications of the Detroit Edison Electric Service Installation Guide (ESIG).

Upon receipt of an enrollment request and completion of a site visit, the customer will be informed of the appropriate metering requirements. If the only work required is the installation of a telephone line and a meter replacement, the upgrade will be done in three steps: 1) site preparation, 2) telephone line installation, and 3) meter replacement.

7.2.1 Site Preparation

As part of the site evaluation, Detroit Edison will install a small enclosure near the existing meter enclosure. This enclosure will serve as the termination point for both customer and Detroit Edison supplied equipment. It will be marked with the label "CUSTOMER ACCESS ENCLOSURE."

7.2.2 Telephone Line Installation

The customer must provide a working telephone line to be used to communicate with the meter and retrieve the metered data. The telephone company refers to the required telephone line as "Plain Old Telephone Service" (POTS). The customer is responsible for all costs associated with installing, operating, and maintaining this telephone service.

Detroit Edison does not require the telephone line to be assigned exclusively to the meter. Rather, it can be an extension of an existing telephone line that also serves other devices, such as a fax machine or an ordinary telephone. This is possible because Detroit Edison will program the meter to initiate the telephone call to its data acquisition equipment. If the customer wishes to have direct access to the meter or wishes to grant access to its supplier, the meter must be programmed to answer, rather than initiate, a telephone call. However, the customer must provide a telephone line assigned exclusively to the meter and supply the telephone number to Detroit Edison.

The telephone line must be permanently installed to ensure its continued availability for meter interrogation. It must be terminated inside the customer access enclosure using a female RJ11C telephone jack.

In locations where installation of a telephone line is impractical, a cellular telephone may be used. It is the customer's responsibility to: 1) place the telephone in a location that will ensure reliable communication with the meter, 2) extend the connection from the telephone to the customer access enclosure, and terminate the line inside the enclosure using a female RJ11C telephone jack, and 3) protect the telephone from theft or vandalism by housing it in an appropriate enclosure. At the request of the customer and if feasible, Detroit Edison will provide a 120 volt AC feed from the metering installation to power the cellular telephone. See Appendix W, Cell Phone Specifications and Installation Instructions for cell phone equipment requirements and installation instructions. Detroit Edison reserves the right to reject any cell phone installation that does not meet its requirements.

7.2.3 Meter Installation or Replacement

When the customer notifies Detroit Edison that the installation of an operational telephone line has been completed, Detroit Edison will schedule the meter installation upgrade. At the time of the meter upgrade, the Detroit Edison meter tester/installer will determine if the telephone line is operational. If the telephone line is operational, the meter tester will install the meter, connect the telephone line, and establish communications with Detroit Edison data acquisition equipment. At this time, the installer will also wire the data and time pulses from the meter and terminate them in the customer access enclosure. These pulses are for customers or suppliers who desire to monitor usage on a real-time basis. A more thorough description of this service is provided in Section 7.4.

If the telephone line is not operational, the meter installation will not be upgraded, and the customer will be required to correct the defect. When the customer notifies Detroit Edison of the defect correction, Detroit Edison will revisit the site and upgrade the meter installation.

7.2.4 Existing Telephone Lines

In the event a Detroit Edison supplied telephone line already exists at a location converting to electric choice service, the customer may continue to use that line by transferring the account from Detroit Edison and assuming all associated expenses.

7.2.5 Removal of Special Metering

If, in order to qualify for electric choice, a specific location must have its special purpose loads (such as interruptible air conditioning) combined with its base load, Detroit Edison will determine the method for combining these loads. Detroit Edison may elect to remove the meter for the special load and rewire the service so that the entire load at that location is served through one meter. Alternatively, Detroit Edison may elect to leave the meter for the special load in place and calculate the entire load by adding together the usage measured by each individual meter. If the special purpose load is remotely interruptible, the control device will be disabled or removed.

7.3 Meter Data Acquisition

Detroit Edison will retrieve the metered data from the electric choice location using a telephone line that is installed and maintained by the customer. The data retrieval will occur at least once during each billing month, but normally more frequently to minimize data loss in case of equipment failure. In addition, Detroit Edison will use a manual data retrieval system as backup for data collection emergencies such as telephone line failure.

7.3.1 Telephone Line Data Retrieval

The meter will be programmed to initiate toll-free telephone calls to Detroit Edison's data acquisition equipment . Such calls will be scheduled to occur during off-peak hours (11:00 p.m. to 7:00 a.m. Eastern Time) to minimize interfering with the customer's use of that telephone line. However, the meter may initiate a call at another time if the communication was not successful during the scheduled data retrieval period.

7.3.2 Manual Data Collection

If Detroit Edison is unable to retrieve the metered data using the telephone line, then Detroit Edison will visit the meter location and collect the data using a manual data retrieval system. At a minimum, such visits are required when the account is due for billing but may occur more frequently because of special data needs or special investigations. The customer must provide access to the metering equipment in accordance with Section B-5.4 of the MPSC Rules and Regulations Governing the Sale of Electric Service.

If the inability to retrieve metered data is due to a failure of the telephone line, Detroit Edison will notify the customer of such failure, and the customer will be responsible for repairs. If necessary, Detroit Edison will collect metered data manually for up to two weeks after notifying the customer of the telephone line failure. Thereafter, if the telephone line is still not operational, Detroit Edison will continue to collect the data manually for a charge of $12 per meter per monthly site visit. If after three months, the telephone line is still not operational, Detroit Edison may discontinue electric choice service and return the customer to bundled service.

7.3.3 Estimated Meter Read

If metered data is not available in time for billing for any reason, Detroit Edison will reconstruct the missing data following MPSC- approved estimation procedures. The historical usage for that location will be used to determine the total consumption for the billing period being estimated. Historical data also will be used to calculate the hourly usage required for marketer reconciliation for that location. A complete description of these procedures can be obtained from the Electric Choice Supplier Support Center.

Estimated data will not be used to establish a new maximum demand or new distribution contract capacity. Rather, the demand billing determinants in effect at that time will be used to calculate the distribution charges.

7.4 Access to Usage Data

Detroit Edison provides electric choice customers and/or their suppliers with three options for accessing usage data: 1) receiving data pulses from the meter; 2) retrieving interval data posted on the Detroit Edison web site; and 3) direct access to the meters. Other information, such as historical usage or billing determinants, will also be available to the customer or its supplier, as described in Section 5.5.

7.4.1 Customer Access to Interval Meter Data via the Detroit Edison Web Site

Detroit Edison will make available on its web site usage data for all its interval-metered customers regardless of their participation in electric choice. The usage data will be supplied for each meter in 30-minute intervals. New data will be posted periodically as it is collected and processed by Detroit Edison. Historic data, to the extent available, will be retained for up to 14 months. Access to this data will be granted free of charge to bundled customers and electric choice customers and their suppliers. Customers will be able to access their own usage data. Suppliers will only have access to the usage data of the customers they are serving and only for the period of time they have been serving them. The usage data will be accessed using a product known as MV-WEB. With this product, the data can be displayed in a variety of ways, including charts, graphs, and tabular format. It can also be downloaded for further evaluation and analysis.

Under normal circumstances, remotely read meters are queried once a week with the data made available on MVWeb within two business days of the read date. When remote access to the data is is not available, Detroit Edison will attempt to manually obtain the data on the next scheduled monthly bill cycle date. This data will be posted to MVWeb within two business days. Detroit Edison reserves the right to update the data in accordance with the MPSC approved billing rules.

To access the web-based interval meter data, a User ID and password are needed. Suppliers are automatically granted access privileges when they register with Detroit Edison. Information on how customers can obtain this service is found in Section 5.5.4.

7.4.2 Data Pulses

At every electric choice meter location, Detroit Edison will provide, at no extra cost, access to data pulses so the customer or its supplier can monitor, on a real-time basis, the energy delivered to the customer. These pulses can be recorded over time using commercially available pulse recorders, or they can be used as inputs into a load management system.

The data pulse circuits will be terminated in the same customer access enclosure where the customer will terminate the telephone line. Separate circuits will be provided for kilowatthours, kilovarhours, and end-of-interval time pulses from the meter. Instructions for connecting to and energizing the pulse circuits are included in Appendix R: Typical Metering Installations for Electric Choice Locations. The kilowatthour and kilovarhour values of the data pulses will be recorded on a label in the customer access enclosure.

In the event of failure of these pulses, Detroit Edison's liability will be limited to repairing the pulse equipment.

7.4.3 Direct Access to Meter

For customers, and suppliers of electric choice customers, desiring greater control over access to their usage data, Detroit Edison will configure the metering installation so they can have direct access to the meters. To accomplish this, the customer will be required to provide a telephone line exclusively dedicated for the use of the meter, and Detroit Edison will program the meter to answer, rather than initiate, a data collection telephone call. With this configuration, Detroit Edison and the customer, or its supplier, will be able to retrieve the usage data directly from the meter.

However, this arrangement results in reduced protection against unauthorized third-party access to the meter. While appropriate passwords will be used to protect the meter settings and the usage data from being altered, protection against an intruder viewing and retrieving the usage data is significantly reduced.

As an alternative, a customer may request that Detroit Edison provide a stand-alone recorder for its or its supplier's use. This configuration will improve data privacy protection because Detroit Edison will be the sole entity that can directly access the meter, and the customer, or its supplier, will have control over access to the recorder.

The customer will be billed for the data recorder under Standard Contract Rider 2 of the MPSC Rules and Regulations, at a rate currently set at $8 per recorder per month. This service will be provided under the following conditions:

1) Detroit Edison will own, install, and maintain the stand-alone recorder. Only recorders that are compatible with and supported by the MV-90 system will be used. The stand-alone recorder will be powered by Detroit Edison, have battery backup, and will have memory, modem, and password protection capabilities. The recorder inputs will use the data pulses supplied by the billing meter described in Section 7.4.2.

2) The customer or its supplier will be given control over access to the recorder. The customer will be able to program the recorder either to initiate or to answer a telephone call. The customer may install and maintain its own password to control access to the recorder's data. The password does not need to be shared with Detroit Edison.

3) The customer will be required to provide a telephone line to the recorder to permit the customer to retrieve the energy usage data. Whether the line is shared or assigned exclusively to the recorder will depend on how the recorder has been programmed.

4) Detroit Edison will continue to obtain its usage data directly from the meter. The meter can share the recorder's telephone line because the meter will be programmed to initiate a telephone call to Detroit Edison.

5) Detroit Edison will endeavor to inform the customer and its supplier of any changes to the meter configuration that may result in data errors. The customer or its supplier is responsible, however, for verifying the accuracy of the recorder data by comparing it as frequently as practical (but at least once every thirty (30) days) against the meter data posted on the Detroit Edison web site.

7.5 Load Profiling

The objective of the load profiling system is to develop a method of distributing a customer's total energy usage for a specific billing period on an hour-by-hour basis. The method of developing a representation of the customer hourly usage pattern is called a "proxy" curve. The monthly energy usage for each customer can then be distributed to each hourly interval in the billing period on a prorated basis relative to the "proxy" curve. The monthly energy usage will continue to be measured by a standard kilowatthour meter, which is read at the end of the billing period.

The following definitions may be helpful in understanding load profiling methodology:

Net System Output (NSO)

NSO is the energy generated in the Detroit Edison service territory, plus all energy imported over the interconnections minus all energy exported over the interconnections. It is equal to the combined loads of all customers in the Detroit Edison service territory plus the associated losses.

Group 1 Loads (G1)

Group 1 consists of loads whose usage can be determined without metering because their wattage is known and they are energized for predictable periods of time. Street lights are an example of Group 1 loads.

Group 2 Loads (G2)

Group 2 consists of all interval metered loads where the meters provide a record of energy usage on an hourly (or more frequent) basis. Presently, all primary (D6) and some large secondary (D4) services are equipped with such metering. All electric choice customers not qualifying for the meter waiver will be equipped with such metering.

Group 3 Loads (G3)

Group 3 consists of loads from all monthly metered customers where there is no interval metering, but the total energy used during the entire billing period is measured and recorded. This includes all residential and most commercial (rates D3 and D4) services.

7.5.1 At present, Detroit Edison will use two proxy curves to profile all electric choice customers who elect the meter waiver. One proxy curve will be used for all residential customers and the other proxy curve for all commercial customers served by single-phase service. Detroit Edison reserves the right to further subdivide these two curves if deemed necessary to improve profiling accuracy.

The proxy curves will be constructed using hourly-metered data collected by the Detroit Edison Load Research group from representative residential and commercial installations. The sample meter data for each representative group will be scaled to represent the total hourly usage distribution for the entire customer population for each respective group. Commercial customers served by three-phase service do not qualify for the meter waiver if they participate in electric choice. A third proxy curve is developed for the three-phase secondary customers specifically to estimate the hourly use as an intermediate step in calculating hourly use of the residential and single-phase commercial customers.

Detroit Edison will further refine these proxy curves by adjusting them to Net System Output (NSO). If these three proxy curves are added together, they should equal the G3 load. But the G3 load can also be calculated by subtracting from NSO the G1 load, the G2 load, and the total losses. The three proxy curves will be adjusted hour-by-hour, on a prorated basis, to make their sum equal to the value of G3 calculated from the NSO.

Following is a summary of the process used to derive the adjusted proxy curves:

- Determine the NSO for each hour on an on-going basis.
- Summarize all interval measured loads, then apply the applicable loss factor (G2 load).
- Calculate the static load (i.e., street lights, traffic lights, cable amplifiers, etc.), then apply the applicable loss factor (G1 load).
- Determine the portion of the NSO attributable to the monthly metered loads (identified as G3 loads) by subtracting losses, the G1 and G2 loads from the NSO formulated as:

$$NSO_{G3} = NSO-(G1\ loads + losses)-(G2\ loads + losses)$$

- Use tariff losses to adjust NSO_{G3} to correspond to end-use consumption.
- Compare the resulting end-use consumption to the sum of the unadjusted proxy curves obtained from the sample meters and calculate the deviation.
- Distribute the deviation proportionately to the three proxy curves. These adjusted curves will serve as the proxies for the monthly-metered customers.

7.5.2 Profiling Customer Usage

Each customer's usage is profiled as follows:

- Identify the billing period to be profiled
- Assign the customer to a proxy curve
- Profile the customer's usage according to the assigned proxy curve

Once the usage for each customer has been profiled, it is then adjusted for losses and aggregated with other profiled usages and with metered usages to determine each marketer's obligation. See Appendix S: Load Profiling Examples, for a numeric example of the process.

7.5.3 Acceptance of Meter Waiver

Both the end-use customer at each qualifying location and that customer's marketer must agree to accept the meter waiver. In doing so, the marketer must agree to accept the profiled data for the purpose of calculating energy imbalance, and the customer must accept distribution charges based on the maximum demand calculated according to the total kilowatthour usage and applicable load factors. If these conditions are not acceptable, an hourly meter will be installed, and the service charge shown for the commercial secondary customer class contained in the Retail Access Service Tariff (which is summarized in Table 6-1, Section 6.2.9 of this handbook) applies and will appear on the customer's bill.

7.6 Meter Maintenance and Accuracy Assurance

Detroit Edison will maintain the metering equipment so it complies with all accuracy requirements of Section B-6 of the MPSC Rules and Regulations Governing the Sale of Electric Service.

All metering equipment will be tested in accordance with applicable portions of section B-6 of the rules and regulations. In addition to customers, suppliers may request special tests on metering equipment affecting their billing or reconciliation. These "request tests" shall be subject to the same terms and conditions, including charges, described in Section B-6.10 of the rules and regulations applicable to special tests requested by customers.