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**Federal Energy Regulatory Commission Survey on
Demand Response, Time-Based Rate Programs/Tariffs and
Advanced Metering Infrastructure
Glossary**

Actual Annual MWh change: The actual sum of MWh changes due to customer participation in a sponsored Demand Response (DR) program.

Actual MWh Change: The total annual change in energy consumption (measured in MWh) that resulted from the deployment of DR programs during the year.

Actual Peak Reduction: The coincident reductions to the annual peak load (measured in megawatts) achieved by customers that participate in a DR program at the time of the annual system peak of the utility or ISO. It reflects the changes in the demand for electricity resulting from a sponsored DR program that is in effect at the same time a utility or ISO experiences its annual system peak load, as opposed to the installed peak load reduction capability (i.e., Potential Peak Reduction). It should account for the regular cycling of energy efficient units during the period of annual system peak load. For curtailment service providers (CSP), the actual peak reduction should include the DR load provided at the time of the peak for the region in which they aggregate customer load. For utilities, it should include the DR load at the time of the utility annual system peak load. For ISOs/RTOs, it should include the DR load at the time of the ISO/RTO annual system peak load.

Advanced Metering Infrastructure (AMI): AMI is defined as the communications hardware and software and associated system and data management software that creates a network between advanced meters and utility business systems and which allows collection and distribution of information to customers and other parties such as competitive retail providers, in addition to providing it to the utility itself.

Ancillary Service Market Programs: DR programs in which customers bid load curtailments in ISO/RTO markets as operating reserves. If their bids are accepted, they are paid the market price for committing to be on standby. If their load curtailments are needed, they are called by the ISO/RTO, and may be paid the spot market energy price.

Asset Management: The ability to leverage the value of metering data and other available information to increase the value of utility investments and/or to improve customer service. One example is using hourly interval data to measure the load on transformers at the time of the system peak.

Being Used: The term *being used* requires that the AMI network is used today in the manner specified.

Bid Limits: The maximum \$/MWh bid that can be submitted by a DR program participant.

Billing or Revenue Meter: Meters installed at customer locations that meter electric usage and possibly other parameters associated with a customer account and provide information necessary for generating a bill to the customer for the customer account.

Capable: AMI network could initiate interval data and collection without a physical visit to the meter site to reprogram it or to add an extra device of some kind.

Capacity Market Programs (CAP): Demand response programs in which customers offer load curtailments as system capacity to replace conventional generation or delivery resources. Customers typically receive day-of notice of events and face penalties for failure to curtail when called upon to do so.. Incentives usually consist of up-front reservation payments.

Commercial sector: An energy-consuming sector that consists of service-providing facilities and equipment of: businesses; federal, state, and local governments; and other private and public organizations, such as religious, social, or fraternal groups. The commercial sector includes institutional living quarters, sewage treatment facilities, and street lighting. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a wide variety of other equipment. Note: This sector includes generators that produce electricity and/or useful thermal output primarily to support the activities of the above-mentioned commercial establishments.

Cooperative Electric Utility: An electric utility legally established to be owned by and operated for the benefit of those using its service. The utility company will generate, transmit, and/or distribute supplies of electric energy to a specified area not being serviced by another utility. Such ventures are generally exempt from federal income tax laws. Most electric cooperatives were initially financed by the Rural Utilities Service (formerly the Rural Electrification Administration), U.S. Department of Agriculture.

Critical Peak Pricing (CPP): CPP rates are a hybrid of the TOU and RTP design. The basic rate structure is TOU. However, provision is made for replacing the normal peak price with a much higher CPP event price under specified trigger conditions (e.g., when system reliability is compromised or supply prices are very high).

Curtailed Service Provider (CSP): DR load providers that are not necessarily load serving entities. CSPs may sponsor demand response programs and sell the demand response load to utilities, RTOs and/or ISOs.

Customer Accounts: A record at the energy provider that identifies an entity receiving electric service at one or several locations within the utility service footprint that is associated with one entity responsible for payment for the energy consumed and metered at the location(s). There may be no meter associated with the customer account (such as with street lights), or one or more meters associated with a particular customer account.

Demand Bidding/Buyback (DB): A DR program where customers or curtailment service providers offer bids to curtail based on wholesale electricity market prices or an equivalent. Mainly offered to large customers (e.g., one MW and over), but small customer DR load can be aggregated by curtailment service providers and bid into the demand bidding program sponsor.

Demand Response (DR): The planning, implementation, and monitoring of activities designed to encourage customers to modify patterns of electricity usage, including the timing and level of electricity demand. DR covers the complete range of load-shape objectives and customer objectives, including strategic conservation, time-based rates, peak load reduction, as well as customer management of energy bills.

Demand Response Event: A period of time identified by the DR program sponsor when it is seeking reduced energy consumption and/or load from customers participating in the program. Depending on the type of program and event (economic or emergency), customers are expected to respond or decide whether to respond to the call for reduced load and energy usage. The program sponsor generally will notify the customer of the DR event before the event begins, and when the event ends. Generally each event is a certain number of hours, and the program sponsors are limited to a maximum number of events per year.

Demand Response Load: The load reduction that results from demand response activities.

Direct Load Control (DLC): A DR activity by which the program operator remotely shuts down or cycles a customer's electrical equipment (e.g. air conditioner, water heater) on short notice. Direct load control programs are primarily offered to residential or small commercial customers.

Duration of Event: The length of an Emergency or Economic Demand Response Event in hours.

EIA ID Number: Unique identification number assigned by EIA to companies and entities operating in the electric power industry.

Economic Demand Response Event: A DR event in which the DR program sponsor directs response to an economic market opportunity rather than for reliability or because of an emergency in the energy delivery system of the program sponsor or the RTO/ISO.

Electric Power: The rate at which electric energy is transferred. Electric power is measured by capacity and is commonly expressed in megawatts (MW).

Electric Utility: A corporation, person, agency, authority, or other legal entity or instrumentality aligned with distribution facilities for delivery of electric energy for use primarily by the public. Included are investor-owned electric utilities, municipal and state utilities, federal electric utilities, and rural electric cooperatives. A few entities that are tariff based and affiliated with companies that own distribution facilities are also included.

Electricity: A form of energy characterized by the presence and motion of elementary charged particles generated by friction, induction, or chemical change.

Emergency Demand Response Event: A DR event called by the program sponsor in response to an emergency of the delivery system of the demand response sponsor or of another entity such as a utility or ISO.

Emergency Demand Response Program (EDRP): A DR program that provides incentive payments to customers for load reductions during periods when reserve shortfalls arise.

Energy: The capacity for doing work as measured by the capability of doing work (potential energy) or the conversion of this capability to motion (kinetic energy). Energy has several forms, some of which are easily convertible and can be changed to another form useful for work. Most of the world's convertible energy comes from fossil fuels that are burned to produce heat that is then used as a transfer medium to mechanical or other means in order to accomplish tasks. Electrical energy is usually measured in kilowatt-hours.

Energy Efficiency: Refers to programs that are aimed at reducing the energy used by specific end-use devices and systems, typically without affecting the services provided. These programs reduce overall electricity consumption (reported in megawatt-hours), often, but not always, without explicit consideration for the timing of program-induced savings. Such savings are generally achieved by substituting technologically more advanced equipment to produce the same level of end-use services (e.g. lighting, heating, motor drive) with less electricity. Examples include energy saving appliances and lighting programs, high-efficiency heating, ventilating and air conditioning (HVAC) systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems.

Enhanced Customer Service: The ability to offer ultimate customers the choice of bill data, additional rate options such as real time pricing or critical peak pricing, verify an outage or restoration of service following an outage, more information to understand a customer concern over an electric bill, reduce bill estimates when a meter read is not available, opening or closing of an account due to customer relocation without requiring a site visit to the meter(s), and/or more accurate bills.

Executive Dashboard: The ability of the AMI network to provide information that would support utility management viewing on a timely basis such information as current outages and MW sales. In this context, the utility would need to also have an executive dashboard application. Timely would not necessarily mean in real-time but it would likely mean that within an hour to 24 hours, management would be able to view usage measured at revenue and billing meters across the utility service territory.

Gas Meter: A meter that measures natural gas usage for ultimate customers.

ICAP Credit: An ISO capacity credit to satisfy a resource requirement.

Industrial: The energy-consuming sector that consists of all manufacturing facilities and equipment used for producing, processing, or assembling goods. The industrial sector encompasses the following types of activity: manufacturing; agriculture, forestry, and fisheries; mining; and construction. Overall energy use in this sector is largely for process heat and cooling and powering machinery, with lesser amounts used for facility heating, air conditioning, and lighting. Fossil fuels are also used as raw material inputs to manufactured products. This sector may include energy deliveries to large commercial customers, and may exclude deliveries to small industrial customers which may be included in the commercial sector. It also may classify by using the North American Industry Classification System or on the basis of energy demand or annual usage exceeding some specified limit set by the energy provider.

Interface with Water or Gas Meters: The ability of the AMI network to collect water or gas meter readings and to transmit the gas or water meter readings over the AMI network to an entity that can provide the gas or water meter readings to the gas or water utility providing the service.

Interruptible/Curtailable Service (I/C): Curtailment options integrated into retail tariffs that provide a rate discount or bill credit for agreeing to reduce load during system contingencies. Penalties may be assessed for failure to curtail. In some instances, the demand reduction may be affected by direct action of the System Operator (remote tripping) after notice to the customer in accordance with contractual provisions. For example, demands that can be interrupted to fulfill planning or operating reserve requirements normally should be reported as Interruptible Demand. Interruptible programs have traditionally been offered only to the largest industrial (or commercial) customers. Interruptible Demand as reported here does not include Direct Control Load or price responsive demand response.

Kilowatt (kW): One thousand watts.

Kilowatthour (kWh): One thousand watt-hours.

Line Loss: Electric energy lost because of the transmission of electricity. Much of the loss is thermal in nature.

Load (Electric): The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy-consuming equipment of the consumers.

Load Forecasting: The estimation of future load requirements for specified intervals for a period of time. The load forecast may provide an estimate of hourly loads for a group of ultimate customers for the next five years, for example.

Maximum Demand: The greatest amount of all demands of the load that has occurred within a specified period of time.

Maximum Hourly Load: This is determined by the interval in which the 60-minute integrated.

Megawatt (MW): One million watts of electricity.

Megawatthour (MWh): One thousand kilowatt-hours or 1 million watt-hours.

Minimum Term: The minimum length in years that customers are obligated to participate in the DR program.

Municipality: A village, town, city, county, or other political subdivision of a state.

Operating Company: The name a utility uses in doing business within a particular state associated with a particular service territory.

Outage Management: The response of an electric utility to an outage affecting the ultimate customers of the electric service. The utility may use the AMI network to detect outages, verify outages, map the extent of an outage, or verify the service has been restored after repairs have been made.

Peak Demand: The maximum load during a specified period of time.

Potential MWh Change: The potential total annual change in energy consumption (measured in MWh) that would result from the deployment of DR programs. It reflects the total change in consumption if the

full demand reduction capability of the program was deployed, as opposed to actual MWh change during the year.

Potential Peak Reduction: The potential annual coincident peak load reduction (measured in megawatts) that can be deployed from DR programs. It represents the load that can be reduced either by the direct control of the utility system operator or by the consumer in response to a utility request to curtail load. It reflects the installed load reduction capability, as opposed to the Actual Peak Reduction achieved by participants, during the time of annual system peak load. It should account for the regular cycling of energy efficient units during the period of system peak load. For utilities, it should be the potential sum of demand reduction capability to their annual peak load (measured in megawatts) achieved by the program participants. For an ISO or RTO, it should be the sum of coincident reduction capability to the ISO or RTO achieved by participants at the time of system peak of the ISO or RTO. Similarly, for CSPs, it should be the sum of coincident reduction capability for sponsored by the CSP achieved by DR program participants at the time of the peak for the region in which they aggregate customer load.

Power Marketers: Business entities, including energy service providers, that are engaged in buying and selling electricity, but do not own generating or transmission facilities. Power marketers and energy service providers, as opposed to brokers, take ownership of the electricity and are involved in interstate trade. Power marketers file with the Federal Energy Regulatory Commission for status as a power marketer. Energy service providers may not register with FERC but may register with the states if they only undertake only retail transactions.

Power Quality Monitoring: The ability of the AMI network to discern, record, and transmit to the utility instances where the voltage and/or frequency were not in ranges acceptable for reliability.

Premise Device/Load Control Interface or Capability: The ability of the AMI network to communicate directly with a device located on the premises of the ultimate customer, which may or may not be owned by the utility. These might include a programmable communicating thermostat or a load control switch.

Pre-Pay Metering: A metering and/or software and payment system that allows the ultimate customer to pay for electric service in advance.

Price Responsive Demand Response: All DR programs that include the use of time-based rates to encourage retail customers to reduce demands when prices are relatively high. These DR programs may also include the use of automated responses. Customers may or may not have the option of overriding the automatic response to the high prices.

Pricing Event Notification Capability: The ability of the AMI network to convey to utility customers participating in a price responsive DR program that a DR event is planned, beginning, ongoing, and/or ending.

Provision of Usage Information to Customers: The ability of the AMI network to convey to ultimate customers information on their usage in a timely fashion. Timely in this context would be dependent on the customer class, with larger customers generally receiving the information with less lag time than residential customers.

Public Utility: Enterprise providing essential public services, such as electric, gas, telephone, water, and sewer under legally established monopoly conditions.

Public Utility District: Municipal corporations organized to provide electric service to both incorporated cities and towns and unincorporated rural areas.

Publicly Owned Electric Utility: A class of ownership found in the electric power industry. This group includes those utilities operated by municipalities, political subdivisions, and state and federal power agencies (such as BPA or TVA).

Railroad and Railway Electric Service: Electricity supplied to railroads and interurban and street railways, for general railroad use, including the propulsion of cars or locomotives, where such electricity is supplied under separate and distinct rate schedules.

Real Time Pricing: A retail rate in which the price for electricity typically fluctuates hourly reflecting changes in the wholesale price of electricity. RTP prices are typically known to customers on a day-ahead or hour-ahead basis.

Reduce Line Losses: The ability to use the AMI network to lower the line losses on the transmission system.

Remotely Change Metering Parameters: The ability to change parameters associated with a particular revenue or billing meter, such as the length of the data interval measured, without a site visit to the meter location.

Remote Connect/Disconnect: The ability to physically turn on or turn off power to a particular billing or revenue meter without a site visit to the meter location.

Residential: The energy-consuming sector that consists of living quarters for private households. Common uses of energy associated with this sector include space heating, water heating, air conditioning, lighting, refrigeration, cooking, and running a variety of other appliances. The residential sector excludes institutional living quarters. This sector may exclude deliveries or sales to apartment buildings or homes on military bases (these buildings or homes may be included in the commercial sector).

Response Time: The maximum notice and lead time that a DR program sponsor provides to DR program participants prior to an economic or emergency demand response event.

Retail: Sales covering electrical energy supplied for residential, commercial, and industrial end-use purposes. Other small classes, such as agriculture and street lighting, also are included in this category.

Revenue Assurance: A set of activities designed to increase the revenue from providing electric service to ultimate customers, including locating meters without associated customer accounts, relatively high line losses compared with other similar locations, energy theft, and/or improper metering installations.

Service Territory: The area within a particular state that an electric utility is allowed to serve ultimate customers for distribution, transmission, or energy services.

Specific Event Limits: The maximum number of events that can be called during a year.

System (Electric): Physically connected generation, transmission, and distribution facilities operated as an integrated unit under one central management or operating supervision.

Theft Detection: The ability to detect when a revenue or billing meter has been potentially tampered with and indicate a potential energy theft in progress that should be further investigated by the utility.

Time-Based Rate: A retail rate in which customers are charged different prices for different times during the day. Examples are time-of-use (TOU) rates, real time pricing, hourly pricing, and critical peak pricing.

Time-of-use (TOU) Rate: A rate with different unit prices for usage during different blocks of time, usually defined for a 24 hour day. TOU rates reflect the average cost of generating and delivering power during those time periods. Daily pricing blocks might include an on-peak, partial-peak, and off-peak price for non-holiday weekdays, with the on-peak price as the highest price, and the off-peak price as the lowest price.

Transformer: A device that operates on magnetic principles to increase (step up) or decrease (step down) voltage.

Transmission: The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission System (Electric): An interconnected group of electric transmission lines and associated equipment for moving or transferring electric energy in bulk between points of supply and points at which it is transformed for delivery over the distribution system lines to consumers.

Transportation: An energy consuming sector that consists of electricity supplied and services rendered to railroads and interurban and street railways, for general railroad use including the propulsion of cars or locomotives, where such electricity is supplied under separate and distinct rate schedules.

Type of Organization: Identifies the type of organization that best represents the energy market participant – Investor-owned utilities (IOU), Municipal Utility (M), Cooperative Utility (C), State-owned Utility (S), Federally-owned Utility (F), Independent System Operator (ISO), Regional Transmission Operator (RTO), Curtailment Service Provider (CSP), or other (O).

Ultimate Consumer: A consumer that purchases electricity for its own use and not for resale.

Uncommitted Capacity: Generating resources that are physically located in the region, but are not dedicated or contractually committed to serve load in the region.

Water meter: A meter that measures water usage for end-use customers.

Watt (W): The unit of electrical power equal to one ampere under a pressure of one volt. A watt is equal to 1/746 horsepower.

Watt-hour (Wh): The electrical energy unit of measure equal to one watt of power supplied to, or taken from, an electric circuit steadily for one hour.

Year of Study: Identification of the projected years covered by a specified study.