CALIFORNIA Efficiency + Demand Management COUNCIL

Common Terms used in Demand Response (Updated July 2022)

Adequacy represents the ability of the electrical grid to always meet the aggregate power and energy requirement of all consumers.

Ancillary Service Programs are DR programs where customers bid load curtailments into various ancillary services markets and agree to be on standby if their bid is accepted. They receive a payment if they are called by the ISO/RTO or utility.

Auto-DR is a form of demand response that allows customers to participate in DR programs when they enable their automated systems (either energy management systems or process automation systems) to send and receive automated signals from a utility, ISO/RTO or curtailment service provider.

BPA (Bonneville Power Administration) is a federal nonprofit agency based in the Pacific Northwest. Although BPA is part of the U.S. Department of Energy, it is self-funding and covers its costs by selling its products and services. BPA markets wholesale electrical power from 31 federal hydro projects in the Columbia River Basin, one nonfederal nuclear plant and several other small nonfederal power plants. The dams are operated by the U.S. Army Corps of Engineers and the Bureau of Reclamation. About one-third of the electric power used in the Northwest comes from BPA.

CAISO (California Independent System Operator) is a nonprofit public benefit corporation that provides open and non-discriminatory access to the bulk of the state's wholesale transmission grid, supported by a competitive energy market and comprehensive infrastructure planning efforts. The ISO manages the flow of electricity across the high-voltage, long-distance power lines that make up 80 percent of California's and a small part of Nevada's power grid. As the only independent grid operator in the western U.S., the ISO grants equal access to 26,000 circuit miles of power lines and reduces barriers to diverse resources competing to bring power to customers. It also facilitates a competitive wholesale power market designed to diversify resources and lower prices.

Capacity Market Programs are arrangements in which customers offer load reductions as system capacity to replace conventional generation or delivery resources. Participating customers typically receive notice of events requiring a load reduction and face penalties when failing to curtail load. Incentives usually consist of up-front reservation payments.

Capacity Service is a type of demand response service in which demand resources are obligated over a defined period of time to be an available resource for the system operator.

Critical Peak Pricing (CPP) is a rate and/or price structure designed to encourage reduced consumption during periods of high wholesale market prices or system contingencies by imposing a pre-specified high rate or price for a limited number of days or hours.

Critical Peak Pricing with Load Control is demand-side management that combines direct load control with a pre-specified high price for use during designated critical peak periods, triggered by system contingencies or high wholesale market prices.

Curtailment is load reduction for set periods of time.

Curtailment Service Providers (CSPs) are businesses that sponsor demand response programs and that recruit and contract with end users, selling the aggregated demand response to utilities, RTOs and ISOs. A Curtailment Service Provider is sometimes called a Load Aggregator and is not necessarily a load-serving entity.

Demand Bidding/Buyback Programs are DR programs where customers bid load curtailments in the day-ahead or day-of markets which are in competition with supply-side resources.

Demand-Side Management is utility technology and program deployments designed to help customers change their electricity usage, including the timing of use and customer amount of use. These are activities that influence consumption behaviors and don't include changes based on government-mandated energy efficiency standards. DSM contains two components: energy efficiency and demand response.

Demand-Side Resource or **Demand Resource** is an electricity consumer that can decrease its power consumption in response to a price signal or direction from a system operator.

Demand Response is the change in electric use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

Demand Response Auction Mechanism (DRAM) is a pay-as-bid auction to participate directly in the CAISO wholesale market. Sellers offer monthly demand response system capacity, local capacity and flexible capacity to the investor-owned utilities. Sellers must bid directly into the CAISO day-ahead energy market.

Demand Response Events are the time periods, deadlines and transitions during which Demand Resources perform. The System Operator shall specify the duration and applicability of a Demand Response Event. All deadlines, time periods and transitions may not be not applicable to all Demand Response products or services.

Demand Response Program is a company's service/program/tariff related to demand response, or the change in customer electric usage from normal consumption patterns in response to changes in the price of electricity over time or in response to incentive payments designed to induce lower electricity use at times of high wholesale market prices, or a change in electric usage by end-use customers at the direction of a system operator or an automated preprogrammed control system when system reliability is jeopardized. Includes both time-based rate programs and incentive-based programs.

Demand Response Providers (DRPs) are commercial entities that provide demand response services such as assisting retail customers with strategies or technology to reduce their electric consumption and then making the electric load reductions as a 'bid' in wholesale energy markets

Direct Load Control is a demand response activity by which the program sponsor 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. Also known as direct control load management.

Direct Participation is the bidding of retail customers' load reductions in wholesale markets.

Dispatchable DR is electricity consumption that can be reduced based on communication from a control center. It includes direct load control, interruptible demand, CPP with control, load as a capacity resource, spinning and non-spinning reserves, regulation and energy-voluntary and energy=price resources.

Distributed Energy Resources (DERs) include rooftop solar and other distributed renewable generation resources, energy storage, electric vehicles, time variant and dynamic rates, flexible load management, demand response, and energy efficiency technologies. California leads the nation in the growth of distributed energy resources, which will continue due to groundbreaking policies such as Senate Bill 100, as well as new commitments to increase transportation and building electrification and continued commitment to behind the meter solar generation and storage.

Electric Grid is a system of synchronized power providers and consumers connected by transmission and distribution lines and operated by one or more control centers. The continental U.S. electric power grid consists of three systems: The Eastern Interconnect, Western Interconnect and Texas Interconnect.

Economic Demand Response is employed to allow electricity customers to curtail their consumption when the productive or convenience of consuming that electricity is worth less to them than paying for the electricity.

Electric Utility is a corporation, person, agency, authority, or other legal entity or instrumentality producing, transmitting, or distributing electricity for use primarily by the public. This includes: 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 owning distribution facilities are also included in this definition.

ERCOT (Electric Reliability Council of Texas) manages the flow of electric power to 24 million Texas customers - representing about 90 percent of the state's electric load. As the independent system operator for the region, ERCOT schedules power on an electric grid that connects more than 43,000 miles of transmission lines and 550 generation units. ERCOT also performs financial settlement for the competitive wholesale bulk-power market and administers retail switching for 7 million premises in competitive choice areas. ERCOT is a membership-based 501(c)(4) nonprofit corporation, governed by a board of directors and subject to oversight by the Public Utility Commission of Texas and the Texas Legislature. ERCOT's members include consumers, cooperatives, generators, power marketers, retail electric providers, investor-owned electric utilities (transmission and distribution providers), and municipal-owned electric utilities.

Emergency or Backup Generation are electric power systems that located at a customer site and are typically used for the purposes of supporting DR programs in that when the system's reliability is threatened, the system operator may automatically dispatch the generator at the customer's site.

Emergency Event is an abnormal system condition (for example, system constraints and local capacity constraints) that requires automatic or immediate manual action to prevent or limit the failure of transmission facilities or generation supply that could adversely affect the reliability of the Bulk Electric System.

Emergency Demand Response is employed to avoid involuntary service interruptions during times of supply scarcity.

Emergency Load Reduction Program (ELRP) is the CPUC's 5-year off-market pilot program designed to pay electricity consumers for reducing energy consumption or increasing electricity supply during periods of electrical grid emergencies.

End-Use Customer is a firm or individual that purchases electricity for its own consumption and not for resale; an ultimate consumer of electricity.

Energy Service Providers: See Power Marketers.

Federal Electric Utility is either owned or financed by the Federal Government.

FERC (Federal Energy Regulatory Commission) is a federal agency that has oversight of electricity sales, wholesale electricity rates, oil pipeline rates, natural gas pricing and gas pipeline certification, and hydroelectric licensing. FERC is responsible for publishing standards on Smart Grid interoperability to ensure that devices and technologies deployed across the grid work together. It is an independent regulatory agency within the DOE and is the successor to the Federal Power Commission.

Fully-Automated Demand Response does not involve human intervention, but is initiated at a home, building, or facility through receipt of an external communications signal. The receipt of the external signal initiates pre-programmed demand response strategies.

Hourly Pricing is a plan in which energy prices vary by the hour, usually based in part on a wholesale market price for energy.

Installed Capacity (ICAP) is the measure of an energy market's combined electric generating and demand response reduction capacity, usually measured in megawatts (MW) determined by either the full nameplate output of a generating asset or the demand reduction capability of a demand response resource.

Interruptible Load is the customer load that can be interrupted at the time of annual peak load by the action of the consumer at the direct request of the system operator. This type of control usually involves large commercial and industrial customers and is governed by a contact. There may be penalties for failure to curtail electricity consumption upon receipt of the request. Interruptible load does not include direct load control. It is also known as curtailable load and is classified by NERC as a form of dispatchable DR.

ISO (Independent System Operator) an independent, federally regulated (U.S. or Canada) entity established to coordinate regional transmission in a non-discriminatory manner and ensure the safety and reliability of the electric system. These organizations monitor system loads and voltage profiles, operate transmission facilities and direct generation, define operating limits, develop contingency plans and implement emergency procedures.

ISO –NE (ISO New England) is the independent, not-for-profit company authorized by FERC to perform three critical, complex, interconnected roles for the region spanning Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and most of Maine. Grid operation: coordinate and direct the flow of electricity over the region's high-voltage transmission system; Market administration: design, run, and oversee the billion-dollar markets where wholesale electricity is bought and sold; Power system planning: the studies, analyses, and planning to make sure New England's electricity needs will be met over the next 10 years.

Load Curtailment is when customers are paid a specified amount per kW curtailed in response to a call that is made on a day-of basis. This requires the specification of a baseline or normal usage.

Load Shedding is the reduction of electricity use or "load" by participants to alleviate pressure on the grid. Usually in response to a DR event.

Load Shifting is the shift of electricity use from peak to off-peak times.

Manual Demand Response involves a labor-intensive approach such as having the building operator manually turn off or change comfort set points at each equipment switch or controller upon receipt of request from the system operator.

Microgrid is a small network of electricity users with a local source of supply that is usually attached to a centralized national grid but is able to function independently.

MISO (Midcontinent Independent System Operator, Inc.) formerly named Midwest Independent Transmission System Operator, Inc. is an Independent System Operator and the Regional Transmission Organization that provides open-access transmission service and monitors the high voltage transmission system throughout the Midwest United States and Manitoba, Canada and more recently integrated a southern region which includes much of Arkansas, Mississippi, and Louisiana. MISO operates one of the world's largest real-time energy markets.

NERC (North American Electric Reliability Corporation) is an international, independent self-regulatory, not-for-profit organization whose mission is to ensure the reliability of the bulk power system in North America. It monitors the bulk power system; develops and enforces reliability standards; assesses future adequacy of electricity; audits owners, operators, and users for preparedness; and educates and trains industry personnel.

NAESB (North American Energy Standards Board) serves as an industry forum for the development and promotion of standards which will lead to a seamless marketplace for wholesale and retail natural gas and electricity, as recognized by its customers, business community, participants, and regulatory entities. NAESB succeeded the Gas Industry Standards Board (GISB) in 2001 with a widened scope to include both retail and wholesale sectors of the gas and electric industries. NAESB standards are voluntary; however, the FERC has traditionally mandated industry adoption of the wholesale market standards.

NERC Regional Entity is a member entity of the North American Electric Reliability Corporation. They were formerly known as Reliability Councils and are organized within the major interconnections in the North American bulk power system. Regional entities work with the North American Electric Reliability Corporation to improve the reliability of the bulk power system. They include:

- Florida Reliability Coordinating Council (FRCC)
- Midwest Reliability Organization (MRO)
- Northeast Power Coordinating Council (NPCC)
- ReliabilityFirst Corporation (RFC)
- SERC Reliability Corporation (SERC)
- Southwest Power Pool RE (SPP)
- Texas Reliability Entity (TRE)
- Western Electricity Coordinating Council (WECC).

Non-Spinning Reserves is a demand-side resource that may not be immediately available, but may provide solutions for energy supply and demand imbalance after a delay of ten minutes or more (FERC).

NYISO (New York Independent System Operator) is at the heart of New York State's electric system, operating the high-voltage transmission network, administering and monitoring the wholesale electricity markets and planning for the state's energy future. The NYISO is responsible for the reliable operation of New York's nearly 11,000 miles of high-voltage transmission and the dispatch of over 500 electric power generators. In addition, the NYISO administers bulk power markets that trade an average of $7.5 billion in electricity and related products annually.

Opt-In is a Time-Based Rate/Tariff or demand response program in which a customer will be enrolled only if the customer chooses to enroll.

Opt-Out is a Time-Based Rate/Tariff or demand response program in which a customer will be enrolled unless the customer chooses not to enroll; a program that is the default for a class of customers but that allows individual customers to choose an alternative rate/tariff or program.

Outage is the time period when some part of the T&D system is not functioning for planned reasons, such as repairs, or unplanned reasons, such as weather or component failure.

Peak Demand is the maximum electricity load required for a period of time, which can be a specific point in time or averaged over a period of time. It is also known as Peak Load.

Peak Time Rebate is a DR program approach where customers receive a cash rebate for each kWh of load that they reduce below their baseline usage during the event hours instead of paying higher rates during the critical event hours.

Peak Shed Programs are generally implemented through automating technologies to reduce the load from certain end-use devices and reduce demand charges that will be paid by the customer.

Peaker Plant is a generator reserved for use during highest peak load periods. Also known as a Peak Load Plant.

Penalties are fines or reductions in payments resulting when a demand response program participant fails to meet targeted load reductions or chooses to not reduce consumption during a DR event (FERC).

PJM Interconnection is an RTO that coordinates the movement of wholesale electricity in all or parts of 13 states, those being Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. Acting as a neutral, independent party, PJM operates a competitive wholesale electricity market and manages the high-voltage electricity grid to ensure reliability for more than 61 million people. PJM's long-term regional planning process provides a broad, interstate perspective that identifies the most effective and cost-efficient improvements to the grid to ensure reliability and economic benefits on a system wide basis. An independent Board oversees PJM's activities.

Potential Peak Reduction is the sum of the load reduction capabilities (measured in megawatts) of the demand response program participants, within the specified customer sector, whether reductions are made through the direct control of the utility system operator or by the participant in response to price signals or a utility request to curtail load. It reflects the demand reduction capability, as opposed to the actual peak reduction achieved by participants (FERC).

Power Marketers are business entities, including energy service providers, which are engaged in buying and selling electricity, but which do not necessarily own generating or transmission facilities. Power marketers and energy service providers take ownership (title) of the electricity, unlike power brokers, who do not take title to electricity. Power marketers are involved in interstate commerce and must file with the FERC for authority to make wholesale sales. Energy service providers will not file with FERC but may file with the states if they undertake only retail transactions (FERC).

Program Type is the category of demand response arrangements between retail or wholesale entities and their retail or wholesale customers. Examples of these arrangements include critical peak pricing, critical peak pricing with load control, direct load control, interruptible load, load as a capacity resource, regulation, non-spinning reserves, spinning reserves, demand bidding and buyback, time of use pricing, real-time pricing, system peak response transmission tariff, peak time rebate, and emergency demand response, all of which are defined in this glossary (FERC).

Proxy Demand Response (PDR) is a participation model for load curtailment to increase demand response participation in the wholesale Energy and Ancillary Services markets. Additionally, PDR helps in facilitating the participation of existing retail demand response into these markets.

Public Utility District is an organization of municipal corporations whose purpose is to provide electric service to either incorporated cities and towns or unincorporated rural areas (FERC).

Publicly Owned Electric Utility are utilities operated by municipalities, political subdivisions, and state and federal power agencies (such as the Bonneville Power Administration and the Tennessee Valley Authority) (FERC).

Real Time Pricing is a rate and price structure in which the retail price for electricity typically fluctuates hourly or more often, to reflect changes in the wholesale price of electricity on either a day ahead or hour-ahead basis (FERC).

Reliability simply put is the ability of the grid operator to effectively balance supply and demand. Additionally, it is a measure of the ability of the electric system to withstand sudden disturbances such as electric short circuits or unanticipated loss of system components (FERC).

Reliability-based DR programs are generally “Call-type,” where participants commit to load reductions. The utility or grid operator pays customers to shed load at peak times and participants are subject to penalties if they fail to meet their commitment. The payments made to participants are subsidized by utilities or grid operators, and ultimately funded by other customers. A baseline for each customer is required to determine the amount of energy shed during the DR incident. Weather and production often convolute these measurements and make financial settlement difficult.

Reliability Event is an event which threatens the safe operation of the grid and can be occasioned by such occurrences as the loss of a line or generator or imbalance between supply and demand (FERC).

Reserve is a service in which demand resources are obligated to be available to provide demand reduction upon deployment by the system operator, based on reserve capacity requirements that are established to meet reliability standards (FERC).

Resource Adequacy (RA) program was developed by the CPUC in response to the 2001 California energy crisis. The program is designed to ensure that CPUC jurisdictional Load Serving Entities (LSEs) have sufficient capacity to meet their peak load with a 15 percent reserve margin.

Response Time is the maximum time allowed in a demand response program for a program participant to react to the program sponsor's notification, in hours (FERC).

Retail Power is electrical energy supplied for residential, commercial, industrial, and other (e.g., agricultural) end-use purposes. Electricity supplied at retail cannot be offered for resale (FERC).

RTO (Regional Transmission Organization) is a FERC-regulated entity similar to an ISO and has similar functions to monitor system loads and voltage profiles, operate transmission, oversee generation, and create and deploy contingency plans and emergency procedures, but cover a larger geographic area.

Semi-Automated Demand Response describes a strategy in which the system operator calls a demand response event, sends a signal to the participant and a person, such as the Demand Response Coordinator or Facilities Manager, initiates a control strategy-preprogrammed into the BAS.

Smart Grid is a bi-directional electric and communication network that improves the reliability, security, and efficiency of the electric system for small-to large-scale generation, transmission, distribution, and storage.

Spinning/Responsive Reserves is a demand-side resource that is synchronized and ready to provide solutions for energy supply and demand imbalance within the first few minutes of an Emergency Event.

Tariff is a published volume of all effective rate schedules, terms and conditions under which a product or service will be supplied to customers.

Time-Based Rate/Tariff is a retail rate or Tariff in which customers are charged different prices for using electricity at different times during the day. Examples are time-of-use rates, real time pricing, hourly pricing, and critical peak pricing. Time-based rates do not include seasonal rates, inverted block, or declining block rates.

Time-of-Use is a rate where usage unit prices vary by time period, and where the time periods are typically longer than one hour within a 24-hour day. Time-of-use rates reflect the average cost of generating and delivering power during those time periods.

Vehicle to Grid Integration (VGI) harnesses the usage characteristics of and technologies within plug-in electric vehicles (PEVs) to allow them to serve as a grid asset, reducing operating costs for facility and vehicle owners, the utilities' distribution maintenance requirements, and energy prices in the wholesale market.

Virtual Power Plant (VPP) is a cluster of distributed generation installations (such as wind-turbines, small hydro, etc.) which are collectively run by a central control entity.

Wholesale pertains to the sale of electric energy for resale.

Wholesale Customer is an entity that purchases electric energy for resale.