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PLMA Recognizes Leading Energy Utility Industry Load Management Initiatives

Vallejo, Calif. – April 17, 2019 – PLMA (Peak Load Management Alliance) announced eight winners of its 16th PLMA Awards today. The Awards will be presented during the 39th PLMA Conference in Minneapolis, Minnesota. Those recognized as outstanding other load management programs, initiatives and achievements in calendar year 2018 are:

Program Pacesetter

- Pacific Gas and Electric Company and Olivine for Excess Supply Demand Response Program
- Portland General Electric and Enbala for Distributed Flexibility at Scale
- Indiana Michigan Power and Tendril for Residential Integrated Demand Side Management Approach

Technology Pioneer

- Bonneville Power Administration, Portland General Electric, and Northwest Energy Efficiency Alliance for Water Heater Communications
- Rocky Mountain Power for Frequency Dispatch
- Viking Cold Solutions for Using Thermal Energy Storage as a Grid Asset

Thought Leader

- Efficiency Vermont, Green Mountain Power, and Dynamic Organics for Flexible Load Management
- Eversource Energy for Commercial & Industrial Active-Demand Management Demonstration

Details about these initiatives are available at www.peakload.org/awards .

The 16th PLMA Awards recognize industry leaders who created, during calendar year 2018, innovative ideas, methods, programs and technologies that manage end use loads to meet peak load needs and support successful grid integration of distributed energy resources. Over the past 15 years, PLMA has presented over 74 awards to recipients who have included utilities, product/service providers, end-users, and individuals responsible for demand response efforts targeted to the residential, commercial, industrial and agricultural customer markets.

PLMA (Peak Load Management Alliance) is a non-profit association founded in 1999 that serves over 150 member organizations as the Voice of Load Management Practitioners. PLMA seeks to advance practical applications of dynamic load management and distributed energy resources by providing a forum where members educate each other and explore innovative approaches to program delivery, pricing constructs, and technology adoption. Learn more at www.peakload.org.

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About the 16th PLMA Award Winners (in alphabetical order)

- **Bonneville Power Administration, Portland General Electric, and Northwest Energy Efficiency Alliance for Water Heater Communications**

A team from the Pacific Northwest spearheaded by three individuals – Tony Koch of the Bonneville Power Administration, Conrad Eustis of Portland General Electric, and Geoff Wickes of Northwest Energy Efficiency Alliance - advanced the testing of the new ANSI/CTA-2045 communications standard to connecting important energy storage assets – electric water heaters and heat pump water heaters. This collaboration and research proposes new economics that will have important impact on DR planning as well as understanding of how to validate and increase energy savings from a new generation of "connected" technologies.

This project had a series of firsts:

- The largest smart water heater pilot ever implemented
- The first large demonstration of heat pump water heaters participating in DR events
- Eight utilities cooperating to implement the same event schedule
- Multiple DR events every day with over 600 events in 220 days
- Coordination with key water heater manufacturers to prove out communications and commands

- **Efficiency Vermont, Green Mountain Power, and Dynamic Organics for Flexible Load Management**

This project demonstrated the importance of partnerships for successful peak load management to benefit Vermonters, reducing carbon and the overall cost of the energy delivery system. Efficiency Vermont had a long-term customer relationship with Brattleboro Retreat, a healthcare facility in Southern Vermont. The project renewed utilization and controls optimization for a 1990s legacy, 3.2 MWh chiller and ice storage system.

Green Mountain Power, the local utility committed to fighting climate change, developed a strategy to share grid benefit and savings with customers from shifting load off peak. Dynamic Organics developed a custom controller and dashboard incorporating weather, electric grid demand and pricing, and HVAC system data simultaneously to allow remote control and automated operation of the ice storage system. A trial of the system during an early summer peak event was successful, and that led to development of an innovative pilot (currently enrolling 10 more customers with diverse flexible assets) to demonstrate grid and customer value. The goal is to then make this a permanent rate option for commercial customers who have flexible load.

- **Eversource Energy for Commercial & Industrial Active-Demand Management Demonstration**

Eversource introduced an innovative holistic approach to reducing peak demand among commercial and industrial (C&I) customers. Their active-demand management demonstration utilized a wide range of technologies, including battery storage, ice storage, phase change material thermal storage, advanced software and controls and wi-fi thermostats, to engage large and small C&I customers. Not only did the demonstration successfully engage with a variety of C&I customers, it also reduced the 2018 regional peak by 8.7 MW.

This demonstration project shows that taking a holistic approach to demand reduction is necessary for the long-term viability of demand-reduction programs and paved the way for the development of an approach to peak-demand management featuring various technology types, each using open communication protocols that connect to a single dispatch platform.

- **Indiana Michigan Power and Tendril for Residential Integrated Demand Side Management Approach**

Indiana Michigan Power (I&M) worked with Tendril to implement Orchestrated Energy, a connected thermostat demand response program dramatically shifting peak load and improving the energy efficiency beyond that of smart thermostats, without sacrificing customer comfort. I&M uses this program as a customer engagement tool that also provides demand response load while keeping customers comfortable. I&M envisions this program as another way to become a trusted energy advisor to their customers on how to utilize the connected home.

IM Home ran on 2,132 thermostats in Indiana and 423 thermostats in Michigan from May 2018 to September 2018 leveraging smart thermostats from ecobee and Honeywell. The program saved 80,220 hours of cooling runtime in Indiana and 8,736 hours of cooling runtime in Michigan. This works out to more than 263 MWh saved in a little more than four months of operation, allowing the program to deliver gross realization rates of more than 100% in both states. This is in addition to the traditional savings already delivered by smart thermostats.

- **Pacific Gas and Electric Company and Olivine for Excess Supply Demand Response Program**

The Pacific Gas and Electric Company (PG&E) Excess Supply Demand Response program (XSP) demonstrates capabilities of demand-side resources to consume or decrease load as a service to the grid to address intermittency due to oversupply of renewables generation as distributed generation accelerates. The California PUC Load Shift Working Group noted in 2018 that the XSP was the only existing load shifting participation model. Designed to capture the full value of flexible resources to the grid it has been incorporated into initiatives across various consumer types including California Energy Commission EPIC Total Charge Management project, PG&E's Electric Vehicle Charge Network Load Management Plan, and the Pittsburg USD School Bus Renewables Integration Project.

In 2018, events were triggered using PG&E developed excess-supply forecasts. Of the total number of dispatches in 2018, 221 of the dispatched hours aligned with the CAISO's reported renewable curtailment hours for 385 MW of consumption. On average, participants in the XSP can expect eight dispatches per month. Regulatory efforts have already begun in California to develop new models of participation for resources that can respond to load increase dispatches and lessons from the operation of the XSP have already gone on to inform these efforts. The XSP is the first step of what is to come with regards to developing participation models that can fully utilize resources with these flexible characteristics as a service to the grid.

- **Portland General Electric and Enbala for Distributed Flexibility at Scale**

Portland General Electric (PGE) has created a technology agnostic, interoperable virtual power plant (VPP) in collaboration with Enbala that enables PGE to offer control, optimization and demand management of an entire fleet of DERs across various customers, vendors and programs. This multi-program-multi-vendor-ecosystem allows for the customization across DER asset-types, location, participation schedules and service offerings, while providing visibility into, and integration of, data in an approach that is scalable, sustainable, futureproof and customer-focused.

PGE's VPP now includes over 100 large industrial loads, large commercial loads, and small commercial loads; over 150 commercial smart thermostats, and nearly 3,000 multi-family smart water heaters. The VPP is currently integrating a combination of solar, storage, and smart thermostats at a Fire Station with the City of Portland to demonstrate a turnkey microgrid solution in partnership with Powin Energy. PGE is also rolling out a Time-of-Use (TOU) Program and Peak Time Rebate (PTR) Program that will target 58,000 customers in 2019

- **Rocky Mountain Power for Frequency Dispatch**

PacifiCorp demonstrated that Demand Response (DR) resources can be used to deliver GridScale Fast DR to meet frequency dispatch and BAL 3 requirements. This project demonstrated that the Cool Keeper system could be used in an additional capacity with very tight control response. PacifiCorp designed and implemented the automatic dispatch of residential customers enrolled in the Rocky Mountain Power Cool Keeper program utilizing Eaton's two-way devices and Yukon portal to respond to frequency dispatch signals. To comply as frequency dispatch, the resources must immediately begin providing support once dispatched and be fully activated within 50 seconds from event detection. The BAL 3 measurement is a performance curve during this resource dispatch period. The solution resulted in an average of 64MWs of BAL 3 resources and over 100 MWs of load drop across several events during the 2018 summer DR control season. Performance was measured and calculated using two second system metered data collected by the PacifiCorp Energy Management System.

This innovation is a grid scale solution using fast-acting residential DR resources to support the bulk power system. Utilities currently use generating resources to perform this function, but as plants are retired or begin operating at lower levels additional balancing resources are required. The Cool Keeper system provides approximately 200 megawatts of operating reserves to the system using over ~ 100,000 residential AC resources.

- **Viking Cold Solutions for Using Thermal Energy Storage as a Grid Asset**

Commercial & industrial freezers (10,000 to 200,000+ square feet) in the food and beverage, foodservice, grocery, and cold storage industries require massive amounts of electricity to keep frozen food product temperatures stable between 0 and -20 degrees Fahrenheit. These facilities maintain the highest demand per cubic foot of any industrial category and globally spend over $40 billion on energy every year.

Viking Cold Solutions uses thermal energy storage systems (TES) to utilize frozen food facilities in the United States, Mexico, the Caribbean, and Australia as grid assets that enable operators to shed 300-500 kW for up to 13 hours each day. TES systems leverage the facility's existing refrigeration system to store energy in the form of cold and discharge that energy over long periods of time when it is most economical for the grid and the facility operator. These systems have no mechanical components and use phase change material, to absorb up to 85% of the heat infiltration while refrigeration is cycled off, and intelligent controls to balance temperature requirements and energy use. With a levelized cost of energy of less than 2¢ per kWh, many power providers have added TES technology into their efficiency and demand management programs to improve efficiency an average of 26%, help address the variability of renewables, and unlock large-scale demand management opportunities for a fraction of the cost of other storage mediums.

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