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Clean energy storage systems needed for resilient cities

The 7th annual Energy Storage North America (ESNA) Conference and Expo took place in San Diego earlier this month. The three-day conference drew 2,500 influential policy makers, technology and market leaders, with participants from 30 countries.

Solar and wind power are considered intermittent sources of renewable energy in that they are not consistently reliable due to weather variables. This is where the energy storage industry comes into play and the need for low cost, efficient, reliable battery storage systems.

In the state of California, the landmark California Global Warming Solutions Act of 2006, or AB 32, required the reduction of statewide emission of greenhouse gases to 1990 levels by 2020. Ten years later, Gov. Jerry Brown signed SB 32, which expanded that mandate by requiring California to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030.

In California, we need solutions for energy reliability now for many reasons, including policy mandates; climate change -- which we experience acutely during fire season; emerging Community Choice Aggregation -- an alternative to investor owned utility; and utility bankruptcies.

The age of affordable battery technology is happening quicker than experts had predicted. Big investments, rapid performance improvements, decreasing prices, and breakthrough battery technologies are revolutionizing the way we power our lives and organize energy systems. By as early as 2030 we could see significant use of renewable energy systems. "In the first half of 2019, investors poured more than $1.4 billion into battery technology companies, bringing the reality of a global energy transition closer than ever," according to the Rocky Mountain Institute, an independent nonprofit organization focused on transition from fossil fuel to renewables. "These investments are paving the way for renewables and electric vehicles that will revolutionize our energy system and play a vital role in addressing the climate crisis."

Powering our buildings contributes to 40 percent of U.S. carbon dioxide emissions for lighting, heating, cooling and appliance operation. Cars and trucks account for an additional 20 percent. We have many innovative products and renewable energy systems in place now for lowering those emissions using renewable energy resources.

In order to meet the needs of growing renewable energy use, we need reliable battery storage and platforms that provide sufficient, safe, and consistent energy flow. There were more than 130 companies represented at the ESNA Expo showcasing their technology and services.

BlueSolutions is a company that offers batteries and energy storage solutions based on a unique advanced technology called the LMP battery (Lithium Metal Polymer). The batteries are used for electric buses, car-sharing, and other electric vehicles. BlueSolutions' products are used by small communities and big utilities. Its technology is nonflammable, does not need cooling, has a wide operating temperature range, has a higher energy density, and uses no toxic materials.

Poway-based EPC Power Corp. was there with its scalable power conversion systems that are compact, efficient, and reliable. The company's products are stable, powerful, and smaller than ever. They fit into a variety of applications, including distributed generation, micro-grid, transportation, renewable energy, and industrial manufacturing.

DNV GL, headquartered in Oslo, Norway, released its second annual battery scorecard that benchmarks performance and safety of a range of battery technologies. "A robust program is foundational to the future of the industry," said Richard S. Barnes, executive vice president North America at DNV GL. "The Scorecard will help to accelerate the market, making data about battery safety and performance more transparent and easier to verify with independent reviews."

As part of the conference, several San Diego site tours were offered, including the University of California San Diego's Energy Storage Innovation Hub. UC San Diego owns and operates a 50-megawatt (MW) world-class microgrid, generating more than 90 percent of its annual electricity, heating, and cooling needs. UCSD's East Campus Energy Park & Energy storage Innovation Lab hosts both commercial and research energy installation, including battery and thermal storage, electric vehicle charging, and stationary fuel cell systems. UCSD is the size and complexity of a small city. It has major research and medical facilities that require two times the energy density of average commercial buildings.

San Diego Gas & Electric conducted a tour of its Escondido Battery Facility to a sold out crowd. It is one of the largest lithium-ion battery facilities in the world. It is a 30 MW facility that can store up to 120 MW hours of energy, the equivalent of serving 20,000 customer for four hours. 400,000 battery packs store energy when it is abundant and then delivers power to SDG&E customers when they need it most. The project won ESNA's Innovation Award in 2017.

PXiSE Energy Solutions offered a tour of its downtown, high-rise microgrid at Sempra headquarters. Tour guests learned how solar, storage, and EV charging can be united using high-speed grid controls technology, and how PXiSE's microgrid controls system reduces demand changes and ensures reliability with seamless islanding (battery backup used during a power outage). The tour included a site walk, demonstration of the active microgrid controller, and discussion of what is takes to build a successful microgrid project in a downtown corridor. The discussion also included tactics for tackling space constraints, identifying high-performing equipment, and building a successful team.

There were a number of other interesting San Diego tours, which included a look at Poway School District's 6 MW ENGIE Storage GridSynergy system for 12 campuses, followed by a stop at Mike Hess Microbrewery for a look at their 30 KW energy storage system managed by Green Charge Networks. Energy stability is especially important for breweries as they have frequent and sudden spikes in their load caused by equipment used to chill the beer.

San Diego is definitely one of the leading global cities that are embracing the new economy based on renewable energy technology.

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