

15 November 2019

In this issue:

EnergyX Develops
New Lithium Extraction
Process Using
Membrane
Nanotechnology 1

Berkeley Lab Studies
Improved Membrane
Technology for Flow
Batteries..... 1

Stem and NEC Energy
Solution Partnership
Aimed at Enhancing
Solar + Storage
Projects..... 2

DHS Awards \$180k to
Blockchain
Technology Developer
to Track Cross-Border
Oil Imports..... 2

Power Ledger Inks
Deal to Provide
Blockchain
Technology to
Australian Energy
Retailer..... 3

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K&L Gates’ The Energizer – Volume 56

A biweekly update on blockchain technology applications, distributed energy resources, and other innovative technologies in the energy sector.

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There is a lot of buzz around blockchain technology, distributed energy resources (“DERs”), microgrids, and other technological innovations in the energy industry. As these innovations develop, energy markets will undergo substantial changes to which consumer and industry participants alike will need to adapt and leverage. Every other week, K&L Gates’ The Energizer will highlight emerging issues or stories relating to the use of blockchain technology, DERs, and other innovations driving the energy industry forward. To subscribe to The Energizer newsletter, please click [here](#).

EnergyX Develops New Lithium Extraction Process Using Membrane Nanotechnology

- [Energy Exploration Technologies Inc.](#) (“EnergyX”) has developed and secured rights to a scalable lithium extraction process using metal organic framework membranes to extract lithium from salt brines. EnergyX claims the process, dubbed Lithium Ion Transport and Separation (“LiTAS”), is a faster, more efficient, and ecologically safe means of extracting lithium. Lithium is typically extracted from mining mineral ore through brine evaporation. The brine evaporation process can take 18–24 months and requires large quantities of freshwater. EnergyX’s technology, on the other hand, can be completed within one to two days without the use of fresh water.
- EnergyX asserts that LiTAS results in a lithium recovery rate of 90 percent compared to 30–50 percent from conventional processes and uses less electricity than conventional processes. The demand for lithium may continue to increase as the demand for electric vehicles that use lithium ion batteries and intermittent renewable resources increases. Technologies like LiTAS that accelerate the lithium extraction process and lower the cost of lithium extraction could play an integral role in the global transition to clean energy.

Berkeley Lab Studies Improved Membrane Technology for Flow Batteries

- The [Lawrence Berkeley National Laboratory](#) (“Berkeley Lab”) has researched a membrane technology from a class a polymers known as AquaPIMs that may improve the use of flow batteries. Flow batteries store an electrical charge in tanks filled with a liquid electrolyte that is pumped through electrodes to extract the electrons. The alkalinity of aqueous electrolytes used in many flow batteries can damage the long-term stability of the membrane that separates the electrolyte tanks. Berkeley Lab researchers used an architectural platform based on ladder polymers to address the rigidity of the polymer backbone to improve the stability of a membrane so that it can perform under extreme operating conditions without degradation.

K&L Gates The Energizer — Volume 56

- Despite their promise, flow batteries may be difficult to scale. The cost to deploy them may be prohibitively expensive for utilities because of the increasing cost of certain electrolytes, such as vanadium. The Berkeley Lab's research was supported by the Department-of-Energy funded [Joint Center for Energy Storage Research](#).

Stem and NEC Energy Solution Partnership Aimed at Enhancing Solar + Storage Projects

- Last week, [Stem Inc.](#) (“Stem”), a leader in artificial intelligence (“AI”)-driven energy storage services, [announced](#) a partnership with [NEC Energy Solutions](#) (“NEC”), an energy storage developer, to “simplify and optimize” the deployment of solar plus storage projects. The parties have entered into a master supply agreement through which Stem will resell and integrate its Athena AI platform with NEC’s end-to-end grid storage solutions. The parties believe the partnership will result in a solar plus storage solution for large-scale projects.
- NEC’s GSS Grid Storage Solutions has over 750 MW of energy storage installed, contracted, or awarded in applications including peak shaving, renewable integration, frequency response, frequency regulation, and voltage regulation. The companies believe that leveraging Stem’s Athena AI platform with NEC’s GSS Grid Storage Solutions and AEROS proprietary energy storage controls will perform solar and storage optimization, wholesale market participation services, solar charging compliance and reporting, and warranty compliance and administration. The integration will also bring a DC-coupled solution to the front-of-meter solar plus storage market which Stem states is more efficient for energy production and less expensive to deploy than AC-coupled systems.
- The results of this integration can help address issues that arise in deploying solar plus storage projects. As the CEO of NEC states: “The synergies between Stem’s sophisticated Athena AI platform and our GSS Grid Storage Solutions combined with our AEROS AI software controls suite will help customers maximize revenue and increase the value of their power. We look forward to working closely with Stem, a company known for its expertise in the solar + storage supply chain software and system design.”

DHS Awards \$180k to Blockchain Technology Developer to Track Cross-Border Oil Imports

- On November 6, 2019, the U.S. Department of Homeland Security (“DHS”) Science and Technology Directorate (“S&T”) [announced](#) that it awarded \$182,700 to [Mavennet Systems](#), a Toronto-based blockchain technology group, to alter the company’s oil and gas industry blockchain technology to allow Custom and Border Protection the ability to track cross-border oil imports. The project, “Blockchain-as-a-Service for Cross-Border Oil Exchange,” will focus on applying real-time auditability for Canadian natural gas trading markets. The project will create a generic end-to-end platform, usable by any commodity.
- The award is part of an ongoing effort by DHS to develop and adapt commercial technologies for homeland security. S&T’s [Silicon Valley Innovation Program](#) (“SVIP”) sought blockchain and distributed ledger technologies to help meet this goal. Those enterprises competing in the SVIP are eligible for non-dilutive funding of up to \$800,000 in four phases to help DHS meet its goals.

Power Ledger Inks Deal to Provide Blockchain Technology to Australian Energy Retailer

- On November 7, 2019, [Power Ledger](#), a blockchain trading platform provider, [announced](#) a deal with [Powerclub](#), an Australian electricity retailer, aimed at facilitating peer-to-peer electricity trading between households in southern Australia. Powerclub offers an annual membership for access to wholesale electricity prices. The partnership with Power Ledger seeks to make energy prices more affordable. By integrating the Power Ledger platform, electric vehicles and energy storage devices can be connected to the grid, allowing the excess solar power of Powerclub's South Australian members to be stored and pooled in a Virtual Power Plant ("VPP") application. The VPP will work off of blockchain technology with smart contracts, allowing consumers to buy that electricity when prices are lower and sell during peak demands.
- The deal will allow South Australian residents to trade electricity with the security and automation of blockchain-backed smart contracts. The goal of the deal is to increase the affordability of the electricity for residents. Powerclub believes that the transparency afforded by Power Ledger's blockchain technology will help reduce the price opacity of the energy markets, thus reducing prices.

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