

Thursday, March 1, 2012

## Eos, LMBC see market preparing for batteries under development

Two energy storage firms months away from the prototype stage already attract interest from several well-to-do customers, the firms' top executives told us this week at the Advanced Research Projects Agency-Energy (ARPA-E) Energy Innovation Summit this week near Washington, DC. Both firms rely on different compositions for their metal-air batteries, thus lending them to distinct applications. But anticipation for both to hit the commercial market is uniform.

Eos Energy Storage uses a zinc-air mix that is best suited for substation-level operation, Eos President Steve Hellman told us. At a cost of \$160/KWH each, the 17 KW battery Aurora 17 and 1 MW battery Aurora 1000 offer six hours of storage each, he said. The price is kept low by zinc's abundance, air's free cost and the resulting density of using air to create a chemical reaction, he added. Using air as the cathode reactant removes between 50-70% of the battery's volume, he noted.

**QUOTABLE:** Think of an automobile engine. What happens is, you're taking your gas tank or

gasoline and you're using ambient air as the reactant, if you will, with that gasoline. And as a result you get a vehicle that can drive around and just have the energy stored in the gasoline. Metal-air batteries operate off of the same principle, except they don't release emissions and toxic gases into the atmosphere.

*Eos President Steve Hellman*

The Liquid Metal Battery Corp (LMBC), borne out of Massachusetts Institute of Technology research labs and nurtured to life by investments from Bill Gates and French petroleum firm Total SA, will make "truck container-size" batteries, CEO Phil Giudice told us. The 500 KW battery uses a "self-organizing" combination of metals derived from earth-abundant materials, he said. When the battery draws in air and reaches operating temperature, the densest metal electrode sinks to the bottom, he explained. The electrolyte separates atop that electrode and the lighter liquid metal rests above the electrolyte, he said.

**QUOTABLE:** It's not complicated membranes that we're making, there's no precise sort of engineering from a manufacturing standpoint. The chemistry is precise and the details of this are precise, but it's sort of relatively easy from an operational standpoint.

*Liquid Metal Battery Corp  
CEO Phil Giudice*

Developing chemistry to let electrodes replenish drives the basic innovation behind both LMBC and Eos. Both firms got ARPA-E grants and are about one year away from prototype stage, the said. They declined to give specifics about funding, but their respective officials added the firms attracted plenty of tangible interest from utilities and RTOs.

Metal-air batteries "have been around a really long time," Hellman said, but until recently they lacked recharging properties. Eos's designed its batteries to last 30 years, he said.

Eos figures it can provide rate relief through backup energy storage, making it

[\*Continued on page two\*](#)

## Bill Clinton throws weight behind US infrastructure bank, decoupling

The US should establish an infrastructure bank to finance transmission upgrades that could make better use of renewable energy, former President Bill Clinton said yesterday during a keynote address at the Advanced Research Projects Agency-Energy (ARPA-E) Energy Innovation Summit near Washington, DC. Noting North Dakota could generate 25% of the nation's power through wind generation, the US must concoct clever ways to get such power from scarcely populated areas to the load centers that need it, he said.

**QUOTABLE:** If you just put a little bit of money in from the taxpayers -- a few million dollars -- you could match it and then some. [And this would be accomplished] by making a deal while we're talking about tax

reform to get corporations to invest in the rest because of the returns.

*Former President Bill Clinton*

Adjusting the corporate sales tax and rethinking taxation policies for US firms' foreign profits would fund such an infrastructure bank, Clinton said. Many economists already advocate for the US to reduce its corporate tax rate -- Clinton raised it to 35% during his administration to bring it within the average of well-off OECD nations. Now, that rate is among the highest of the OECD nations after most slashed rates since the 1990s.

Also, most OECD nations followed US policy of taxing the difference between domestic currency into which those profits were being repatriated and the foreign

[\*Continued on page four\*](#)

## US court clears way for Ener1 to emerge from bankruptcy

A federal bankruptcy court this week approved the Chapter 11 reorganization of battery-maker Ener1, clearing the way for it to emerge from bankruptcy by mid-March, Ener1 told the press yesterday. Ener1, now a holding company, will emerge with new equity funding to help execute its business plan, Alex Sorokin, the firm's interim CEO, said in prepared remarks.

The plan restructures Ener1's long-term debt and adds up to \$86 million in equity funding. Holders of existing senior notes, convertible notes and a line of credit agreed to a partial debt-for-equity exchange. The new plan should become effective within two weeks, Ener1 said.

Unlike bankrupts Solyndra and Beacon Power, Ener1 did not get a DOE loan

guarantee, but it did get millions through other DOE programs (SGT, [Nov-14](#)).

Ener1 alienated one of its few utility customers while working toward the bankruptcy restructuring agreement it reached in January, Layne Maxfield, the electrical engineer for Idaho Falls Power, told us (SGT, [Jan-27](#)).

[\[Comments\]](#)

### Information becomes more valuable when it's shared

and our bulk subscriptions provide a simple, cost-effective way to make the benefits of *Smart Grid Today* available throughout your organization while following the copyright law. Groups as small as two readers can enjoy the savings. Contact sales for a rate quote at +1-301-769-6804 (888-471-4447 toll-free in US & Canada) or write to [sales@smartgridtoday.com](mailto:sales@smartgridtoday.com).

## 3 stories in 90 seconds

### ClickSoftware part of AMI

**rollout in Netherlands:** Stedin Measuring is using software from ClickSoftware Technologies to plan a two-million-meter AMI rollout in the Netherlands, ClickSoftware told the press yesterday. The project, set to start this year, will use the firm's workforce-management software to make sure the right meter is installed at the right property, ensuring that bills are addressed properly, it said.

### Group licensing new

**analytical software:** The Smart Grid Research Consortium is licensing its new Smart Grid Investment Model for \$9,500, with an additional \$3,500 fee/year for maintenance and support, the group told the press yesterday. The model is software that

lets utilities assess their business case for grid modernization, according to the group, which described itself as an independent, objective research organization started in 2010 at Texas A&M University. The model delivers specific cost-benefit information on smart grid measures, which are difficult to find, a consortium leader told us in 2010 (SGT, [2010-Dec-14](#)).

### NXP, S&C partner

**on integrated circuits:** NXP Semiconductors will work with S&C Electric Co to develop integrated circuits they said would provide more security for smart grid products. The integrated circuits will incorporate secure authentication, cutting the risk of unauthorized access, they said.

[\[Comments\]](#)

## Eos, LMBC see market preparing for batteries under development

*From page one*

an ideal player in renewable energy integration and peak shifting, Hellman said. Its strongest trait being the long, six-hour storage ability, Eos's battery can manage intermittent wind and solar generation to offer low-cost power during peak periods, he said.

That means Eos's technology makes most sense in states and nations with dynamic pricing policies, Hellman said. Without it, power prices remain distorted, eliminating the benefits of storing wind power generated at night -- when few people use power and thus is cheaper -- and distributing it during the day when people need it.

### Cost savings come easy

Utilities could realize cost savings with Eos's batteries even without dynamic

pricing, Hellman said. For example, utilities could install one battery at a wind generation site and another further down the transmission line near a load center. The battery at the generation site could stockpile power and then send it downstream to the other battery when capacity runs low near the load center, he suggested.

Eos devised a sort of transitional commercialization phase to meet initial demand, Hellman said. Called the "Eos Genesis Program," it will link a small cadre of deep-pocketed buyers with the first market-ready batteries -- with the understanding that those firms will help Eos sort out bugs and improve the product, he said.

"We already have a queue of people who want them. So it's not a question of finding people who are interested," Hellman boasted. "We want to make sure that those

partners understand they're deploying the first generation of the technology and are willing to work with us to make sure that the battery is really suitable to the grid applications that we're targeting."

### Limitations acknowledged

Zinc-air batteries cannot, however, match its lithium-ion and lead-acid counterparts in short-term ramping, Hellman said. Therefore, zinc-air batteries perform poorly in functions such as frequency regulation on an instantaneous basis, he said. Frequency regulation is the injection or withdrawal of real power by resources capable of responding appropriately to a transmission system's frequency deviations or interchange power imbalance.

Markets for energy storage opened up in October when FERC issued a final ruling on frequency regulation compensation in ISO/RTOs. That rule, FERC Order No 755 will pay more for faster service and should be a boon for storage in those markets. Regulation service protects the grid by correcting deviations in grid frequency and balance on transmission lines with neighboring systems. It is provided by generators, storage such as flywheels and EVs, and DR (SGT, [Oct-24](#)).

### RTOs are prime targets

LMBC looks to take advantage of the ruling, Giudice said. Most of the firm's efforts focus on wholesale and ancillary

## Smart grid standards leaders seek your input now

"**Smart Grid Today's Authoritative Guide to US Interoperability Standards**" is the industry's only in-depth, plain-English report on:

- Exactly how the inherently complex process works;
- What has been decided;
- What is next on the agenda;
- How to have your say now, and
- How to keep up with future developments.

The next 12 months represent

the most critical time for smart grid interoperability standards in the US: interop standards are just now emerging. And as few as 75 members of the SGIP plenary can decide which standards get into the organization's catalog and which do not.

*Smart Grid Today's* exclusive report is full of surprises and highly actionable information. It will help you jump into action or refine your existing strategy.

[Purchase report/more information](#)

services markets for capacity reserves, for spinning reserves or for the bursts of short-term energy that frequency regulation requires, he said. That means RTOs are prime targets, and the regulatory structure established a market for firms like LMBC.

Wholesale markets are more accessible because RTOs can make their own investment decisions, unlike utilities that must ask state regulators for rate increases to finance such projects, he added.

With a 500 KW capacity and storage of up to four hours, LMBC's battery also could work as a daytime storage device, Giudice said. That means it, like Eos's product, also could store power generated during off-peak hours and distribute it later to make the most of dynamic pricing policies and peak shifting, he said.

Describing LMBC's potential, Giudice said the firm could one day supply power for between 10-20% of New York City's

11 GW peak load between its ability to operate at the wholesale market and daytime storage levels.

"We can be in any market simultaneously," Giudice said. "Our main competition is combustion turbines, and that's how a combustion turbine is dispatched -- it sort of competes in each of those."

The markets are there, but LMBC's actual battery is not, Giudice said. The electrodes appear to be regenerating through the charge cycle -- the key to attaining any value for grid applications -- and liquid metals should not depreciate after thousands of cycles, he said.

But LMBC has yet to determine all that, as it has not run thousands of cycles, he noted. The firm expects a prototype at the end of next year at the earliest, he said.

"We're still a promise. We're not delivering product right now," Giudice

## Just \$380/year for a subscription to *Smart Grid Today*?

That's the most you could pay for a one-year subscription if someone else in your organization currently has a paid annual subscription to *Smart Grid Today*. That's a 65% discount! The more readers you add, the more you save! Call +1-202-380-9403 (888-380-9407 toll-free in US & Canada) or write to [sales@smartgridtoday.com](mailto:sales@smartgridtoday.com) to ask for details.

said. "It's a very promising promise, but it's still a promise."

[\[Comments\]](#)

### Information becomes more valuable when it's shared

and our bulk subscriptions provide a simple, cost-effective way to make the benefits of *Smart Grid Today* available throughout your organization while following the copyright law. Groups as small as two readers can enjoy the savings. Contact sales for a rate quote, write to [sales@smartgridtoday.com](mailto:sales@smartgridtoday.com).

## New material added to interop standards roadmap

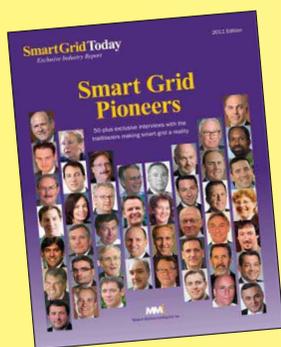
The final version of the "NIST framework and roadmap for smart grid interoperability standards, release 2.0," a free [document](#) publicized Monday, adds to the draft version a new chapter on the roles of the Smart Grid Interoperability Panel; a guide to managing security risks; the Interoperability Process Reference Manual, a framework for testing devices making up the grid; information on worldwide standards efforts; and an overview of future areas of work.

The document "lays out a plan for transforming the nation's aging power system," NIST said. NIST publicized a draft version in October (SGT, [Oct-26](#)).

The final version adds 22 standards, specifications and guidelines to the 75 that NIST recommended in version 1.0, issued in January 2010. Release 2.0 is "a significant update" to 1.0, NIST standards chief George Arnold said in prepared remarks.

[\[Comments\]](#)

# Smart Grid Pioneers Industry Report NOW ONLY \$99



## *Smart Grid Today* industry report features 50-plus exclusive interviews with the trailblazers making smart grid a reality

The smart grid is, in many cases, still experimental. At the same time, there are deployments and certainly many pilots to learn from. Gathered in one document for the first time are over 50 detailed, one-on-one talks with industry leaders making the smart grid a reality.

In this 100+ page report, *Smart Grid Today*'s experienced energy journalists interview the electric industry leaders, luminaries, gurus and field captains who are creating the new digital energy industry.

These exclusive interviews from 2011 reveal insights, analyses, cautions, tips, tricks, predictions, fears, hopes and realizations about the new frontier in energy technology -- and are now available in "**Smart Grid Pioneers**," an exclusive industry report from *Smart Grid Today* - the independent journal of the digital energy industry.

No other source offers the wealth of useful knowledge and experience that *Smart Grid Today* works to compile every business day -- and no other report offers the very best examples of that exclusive reporting.

**Title:** *Smart Grid Pioneers*  
**Price:** \$99 (Reg. \$495)  
**Page count:** 105  
**Release date:** 10/2011  
**Format:** PDF download

Call +1-301-769-6812 (1-888-637-7776 toll-free in the US and Canada) or visit [www.smartgridtoday.com/pioneers-report](http://www.smartgridtoday.com/pioneers-report) for details and to download today!

## Bill Clinton throws weight behind US infrastructure bank, decoupling

*From page one*

currency in which it was earned, Clinton noted. Today, only the US does so.

“We should give the companies a choice: If you want to do whatever you want with the money, pay the long-term capital gains rate,” he said. “If you want to bring it back for free, you can, but you have to put it into the infrastructure bank.”

### Decoupling urged

Utilities also should move toward decoupling to encourage home energy efficiency improvements, Clinton said.

Decoupling separates energy use from profits, basing rate of return on meeting revenue projections rather than on total capacity used.

Decoupling would spur home energy efficiency spending by “allowing the utilities to finance directly so the contractor doesn’t have to go to a bank by simply allowing the utilities to charge more per KWH when fewer KWH are used until the retrofit is paid off,” he said.

Fifteen states have adopted decoupling for one or more electric utilities, with Hawaii being the most recent (SGT, [Feb-14](#)).

[\[Comments\]](#)

---

**Tell us what you think.** Send comments, news alerts, rumors or suggestions to [news@smartgridtoday.com](mailto:news@smartgridtoday.com). Safely submit material anonymously to [tips.mminews.com](mailto:tips.mminews.com).

**Abbreviations:** For a glossary of *Smart Grid Today*’s abbreviations, see [www.smartgridtoday.com/glossary](http://www.smartgridtoday.com/glossary).

**Conferences:** For a constantly updated, selective listing of upcoming conferences, see [www.smartgridtoday.com/events](http://www.smartgridtoday.com/events).

**Smart Grid Today** is published 247 times/year on business days by Modern Markets Intelligence Inc. (MMI Inc.) at 4908 Hornbeam Drive, Rockville, MD 20853-1475 USA, 888-980-4446 or +1-301-769-6903 by phone, +1-301-769-6917 by fax. Standard rate for a one-year subscription is \$1,087 in US funds (plus 6% sales tax in Maryland). Significant discounts for bulk and corporate subscriptions are available, including some that allow putting copyright-protected issues on a password-protected intranet site for an entire company to see. **We welcome all news tips and rumors.** Contact **Brett Brune**, editor, 301-769-6903, x113, [brett@mminews.com](mailto:brett@mminews.com). Or submit anonymous tips safely to [tips.mminews.com](mailto:tips.mminews.com). **Dan Richman**, senior reporter, 301-769-6903 x108. **Zack Colman**, Washington, DC, reporter, 301-769-6903, x202. **Sam Spencer**, publisher & CEO. **Season Crawford**, VP of marketing, associate publisher. **Liz Yap**, production director.

[support@smartgridtoday.com](mailto:support@smartgridtoday.com)  
[www.smartgridtoday.com](http://www.smartgridtoday.com)