Batteries International
Issue 135 Spring 2025

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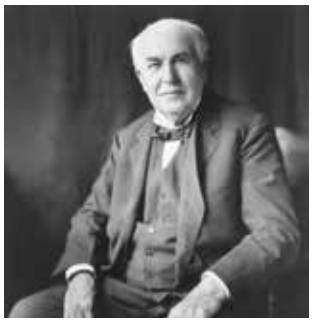

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Mike Halls • editor@batteriesinternational.com

Myth making, China baiting and the lead battery psyche

That ancient Chinese proverb — "The wild grass grows in harmony when the mongoose sleeps at dawn" — might make some sense to some of a mystical bent in the *Batteries International* readership.

If it does, it shouldn't. Confucius didn't make it up. I did.

There's a patchwork of nonsense that surrounds almost all western contact with China. It's not dreamy. Nor mystical. Mostly it's absurd.

Here's another example, purportedly from an ancient Chinese proverb. "May you live in interesting times"? Probably half of adult film goers will have heard of this somewhere (and many others too if they have a predilection to reading the poorer forms of trade journalism).

Normally the phrase is ascribed to some ancient Chinese proverb (or curse, nobody's quite sure). In reality its origin is a myth created in the 1930s about a speech made, believe it or not, in Victorian England.

And the latest part of China baiting (or is it China mystification?) came in the plenary address by Peter Zeihan at this year's BCI annual convention.

Peter's speech was excellent; by turns comic, by turns serious, perceptive and controversial. But also by turns apocalyptic.

His reason for painting this Manichaean picture of the world was a simplistic one — the changing demographic of an ageing population and most particularly the disparity between the ageing populations of the west — here he included China as well — and a low birth rate that would be unable to support the parental generation.

"Since 1991 China has more people over the age of 53 than under," he said. "There is not an economic or political model that humans have yet to theorize much less apply, that will function with where this structure will be in just eight years' time," he said.

"If I were giving you this presentation in January, I would say you have eight years to sever all ties with China, because that's the most time that China has left before their connection to the world's largest financial and consumption power has severed the relationship and established a de facto embargo at most.

"Honestly, I would plan for something less than two [years] at this point.

It's not up to this commentator to question Peter's analysis which was much broader than the ageing demographics of the country but included a dissection on its property sector and its agriculture. That said, information portal Statista gives the Chinese median age as 37.5 years in 2020 and that of the US as 39.2 in 2023.

Clearly an aging population and any reproductive rate below 2.1 will be a problem as the overall population figures fall, but is economic chaos insurmountable?

In 1798 Thomas Malthus argued that the supply of food couldn't keep up with population growth. In 1968 Paul and Anne Ehrlich argued that "the battle to feed all humanity is over" and famine was around the corner in the 1970s with up to 4 billion deaths. Their prophecies attracted widespread media attention.

Malthus's idea was proven wrong because of innovation.

Everything from cheap barbed wire to keep large animals contained cheaply, tractors for large-scale labour saving, even to genetically modified disease resistant wheat, artificial fertilisers and the like have demonstrated that innovation can change things. Even Malcolm McLean's innovation of the modern shipping container in the 1950s showed yet part of the way forward by thinking in another direction.

To put this all in another way. Is this China-bashing just A Convenient Truth? Something that fits the way we as humans think and want to believe.

Remember the very first Earth Day in April 1970? The environmentalists had a field day

trumpeting the world was going to come to a very unpleasant end.

A new ice age was about to happen (*Newsweek*), the earth would be 11 degrees cooler (*Swathmore University*) … humanity would totally run out of copper shortly after 2000, and lead, zinc, tin, gold, and silver would be gone before 1990 (*Scientific American*) … By 1980 urban dwellers will have to wear gas masks because of air pollution and only half of sunlight would penetrate the atmosphere (*Life magazine*] … between 75% and 85% of all the species of living animals will be extinct (*Look magazine*).

Their Convenient Truth was a nonsense that belonged to the start of the environmental movement.

And the idea of that Convenient Truth — our myth-making reflects what we want to believe rather than what is there — is presently going hell for leather when it comes to China and its battery industry.

We're not even talking tariffs here.

This is not to paint a whole industry or country as whiter than white. For most of the lead battery industry China has been — at times — a huge vampire of both IP (intellectual property) and manufacturing expertise. Large swathes of its industry have stolen both with abandon and impunity.

So good has reverse engineering [taking something apart to see how it works and then duplicate the product] become in China one European machine manufacturer, if the rumours are true, is now selling its own products that are made in China by another firm.

China is good at assembling things is something this reporter has heard countless times.

That's true. It is. But it's also good at inventing things.

China is the world leader in terms of battery-related patents comfortably outpacing the US. And in Europe too: four Chinese companies are now among the top 15 battery technology patent applicants at the European Patent Office. This includes CATL, Eve Energy, BYD, and Zhuhai CosMX Battery.

CATL, for example, says it employs 20,000 R&D staff and had an annual budget of $2.9 billion. Not bad for a firm from a country that's meant to be only good at putting things together.

But is our myth-making of IP theft by China peculiar to that country? Hardly. Other countries and industries are doing the same. France's intelligence agencies DGSE and DGSI have, for example, fearsome reputations for industrial espionage. One quirk of history is that French missionary Xavier d'Entrecolles visited China in 1712 only to sell on the manufacturing methods of Chinese porcelain to Europe.

So when you next puzzle over why "the wild grass grows in harmony when the mongoose sleeps at dawn" or whether you want to "live in interesting times", consider the nature of truth and myth.

Are the Chinese a nation of mysterious aesthetes or cut-throat business people out to dominate the world. Isn't it more like they are just the same as the rest of us? Just strangers on a bus trying to make our way home? ■

Mike Halls, editor

Dawn Heng promoted to president of Celgard

Dawn Heng, best known for over a decade as being the popular senior vice president of Daramic, has been promoted to president of the international lithium ion battery separator group Celgard. He was previously senior VP/MD for Asia, specialty business and global marketing.

Celgard is the sister company of lead battery separator giant Daramic and both firms are part of the Asahi Kasei group.

Heng was most recently senior VP/MD, Asia, for specialty business and global marketing for Polypore International and Daramic.

Heng said he looked forward to helping steer advances for lithium as the dominant force for energy storage in the future.

After graduating with a master's degree in economics from the University of Shanghai he worked as a researcher for charismatic international WPP Group. He moved to Johnson Controls in 2008 as marketing manager for China, based in Shanghai.

In 2012 he moved to Daramic where his rise was meteoric, from marketing director for Asia, then global marketing director based in Charlotte, North Carolina. In 2019 he became VP and managing director for global marketing and north-east Asia.

Asahi Kasei is braced for growth and further success amid intensive competition in the lithium ion battery industry, he said.

Last November, Asahi Kasei and Honda announced they had signed a shareholders' agreement to convert an existing Asahi Kasei subsidiary called E-Materials in Canada into a joint venture, to be renamed Asahi Kasei Honda Battery Separator Corporation (provisional working name).

The new venture should start manufacturing the base film and coating of Asahi Kasei's Hipore lithium battery separator in 2027. The aim is to make 700 million m2 per year of coated film. ■

Award honours Birla Carbon's US emissions control project

Carbon additives group Birla Carbon has received an environmental award related to emissions control at its North Bend plant in the US.

Birla said on April 17 that it had been honoured as the judges' choice winner in the environmental impact project category at the 2025 Environment+Energy Leader Awards.

At North Bend, Birla implemented an innovative emission control project designed to effectively reduce sulphur dioxide (SO_2) emissions while enhancing environmental efficiency.

Traditional flue gas desulfurization technologies typically require additional resources and by-products requiring additional handling. ■

Exide appoints Fricke to gel battery tech post

Holge Fricke has been appointed technical director of gel technology and materials at Exide Technologies.

Fricke started the new post in Germany earlier February.

He was most recently Exide's director of basic research for the EMEA region, coordinating research and development activities for automotive and industrial business segments. This included lab service for chemical and material analyses and electrical and mechanical testing of lead acid and lithium ion batteries.

Before that, Fricke was Exide's technical director for industrial product development and he is also a former manager of material development.

Exide confirmed last year that it had developed a new residential battery system based on "tried and trusted lead acid technology" with Dutch company ESS4U.

The battery tech firm said it had supported development of the 'Qurmit' gel residential BESS by the Dutch startup, in collaboration with the VDL Groep." ■

Shirley Meng receives Shep Wolksy award

Argonne National Laboratory senior scientist Shirley Meng has been presented with the Shep Wolsky 2025 Battery Innovator award for her work on battery materials and energy storage.

Meng, who is chief scientist at the Argonne Collaborative Center for Energy Storage Science and a professor at the University of Chicago's Pritzker School of Molecular Engineering (PSME), received the award at the International Battery Seminar in Florida on March 21.

She is also director of the Energy Storage Research Alliance, an innovation hub funded in 2024 by the US Department of Energy's Office of Science.

PSME said her work had transformed ways to design and manipulate energy storage materials. Her contributions include discoveries of novel electrolyte, electro materials, and super ionic conductors for both lithium and sodium batteries.

Meng later said she was dedicating the award to past and present members of the Laboratory for Energy Storage and Conversion at the University of Chicago and University of California San Diego.

The battery innovator award is presented annually in memory of Wolsky, who died in 2017.

In 2023, Meng was honoured by The Electrochemical Society for her work on battery tech innovations. ■

Pruitt, Shaffer win BCI's Distinguished Service Award

Battery Council International has formally honoured Chris Pruitt, president and CEO of East Penn Manufacturing and David Shaffer, the outgoing CEO of EnerSys as recipients of BCI's highest honor the Distinguished Service Award.

The award recognizes exemplary service to the energy storage industry and is the association's highest individual honor. The award recognizes those who have made a sustained, long-term, and meaningful contribution to the advancement of both the association and the battery industry.

Both men have shown extraordinary commitment and loyalty to the battery industry and the work of the BCI.

"Chris Pruitt and Dave Shaffer are true leaders. They have guided their individual companies to success, but also worked hard to support the industry as a whole through partnership with BCI," said BCI's president and executive director Roger Miksad.

"These two executives both served as chairmen of BCI's board during times of tremendous change, volunteering their time selflessly and with good cheer. They truly represent the best of what this industry has to offer."


Chris Pruitt


Dave Shaffer

Chris Pruitt

Chris Pruitt has had a tremendous impact since joining East Penn over 30 years ago. He began as the company's controller in 1994, later serving in several financial leadership roles including CFO. In 2018 he became president and CEO, where he continues to spearhead the company's progress and innovation.

He is both widely liked and well respected. His open-door policy within East Penn is legendary as has been his commitment to promoting a family feeling within the firm,

Chris's impact extends beyond East Penn. He has a long history of service within BCI as a member of the board of directors, and was its chairman from 2021 to 2025. His guidance and support were critical toward helping the organization restructure its leadership and refocus its vision and mission for maximum impact on members.

"His efforts have also been integral to tackling the immense regulatory and advisory work BCI conducts to support important federal policies that promote domestic battery manufacturing and encourage investment in research and development," said Roger Miksad.

"Chris uses his leadership platform to encourage the entire industry to unite and advocate at a company, county, state and federal level to connect with policymakers and help them understand the importance of the battery industry's role in the economy and energy storage future"

Dave Shaffer

Dave's career with EnerSys spans more than two decades, including leadership positions such as president and COO, president of EMEA, and president of Asia, following earlier responsibilities leading telecommunications sales in the Americas. He began his career in the battery industry in 1989.

Under his leadership, EnerSys has delivered key innovations in lead and lithium battery technologies, including advances in safety, sustainability, and recycling. Dave champions EnerSys' corporate responsibility initiatives, with a focus on community engagement, healthcare access, and education.

Dave worked on the BCI board of directors from 2016 to 2025, and was active in BCI's activities for many years before that. He was president of the board from 2019-2021, providing critical leadership to BCI during the Covid pandemic.

Under Dave's leadership, BCI pivoted quickly during these and other difficult times, providing support and advocacy to help all members' facilities stay open to serve the nation's battery needs. ■

VARTA appoints Sebastian Rudow as new CTRO in new management team

Sebastian Rudow has joined the executive board of VARTA as chief transformation and restructuring officer.

The appointment of Rudow is another part of the restructuring team that Michael Ostermann, charged with returning the once-giant manufacturing firm into profit, has appointed since he took over as chief executive in May 2024. This February, Rolf Glessing took over as chief financial officer.

In this issue of Batteries International we have an in-depth interview with Michael Ostermann and his plans for Varta.

Rudow succeeds Michael Giesswein, who, according to a company statement, is leaving at his own request on April 30 following the successful conclusion of the StaRUG proceedings. (StaRUG provided companies in crisis with a set of instruments which they can use for restructuring without having to open formal proceedings).

As CTRO, Sebastian Rudow will support the operational implementation of the restructuring plan and the further transformation of VARTA and drive it forward with the other members of the VARTA executive board.

Rudow has more than 15 years of management experience with companies in restructuring and transformation situations along the entire cycle of a reorganization.

He has worked as CRO, CEO and CFO in various industries, including mechanical and plant engineering, automotive, telecommunications and renewable energies.

Rudow is a fully qualified lawyer and holds a master's degree in corporate restructuring from the University of Heidelberg.

Rudow said: "I am looking forward to leading VARTA AG into the next phase of its transformation and setting the course for a successful future together with the employees. I have known the company as a technology leader and its products for a long time and have followed the dynamic development of recent years with great interest." ■

Changing of guard at Banner as Werner Töpfl becomes CEO

Lead battery manufacturing major Banner has announced that Werner Töpfl has become the first externally-appointed CEO in the company's history.

Austria-headquartered Banner said on April 8 the move was an historic step following more than three decades of leadership by owners Andreas and Thomas Bawart.

Töpfl took over operational management of the firm on April 1. Banner said he had already been gradually integrated into central areas of the company over the past two years and was most recently responsible for finance, IT, controlling, supply chain and sustainability.

He is supported by two long-standing managers, Franz Märzinger and Florian Steinhart, who act as members of the management board.

With the change, Andreas and Thomas are withdrawing from operational management, but will remain closely associated with Banner as owners.

Andreas, previously commercial managing director, said: "We are handing over to a manager who knows and lives our values and at the same time has the necessary entrepreneurial experience to lead Banner further into the future."

Töpfl said: "We have designed a structured transition with clear goals, open discussions and a lot of responsibility."

The new CEO said he wants to make Banner more efficient, digital and market-oriented: "Banner must be noticeably different from the competition through quality, customer proximity, speed and clear decisions." ■

We have designed a structured transition with clear goals, open discussions and a lot of responsibility. Banner must be noticeably different from the competition through quality, customer proximity, speed and clear decisions" — Werner Töpfl

BCI Foundation issues first scholarship awards

Battery Council International and the BCI Foundation have selected the first recipients for a scholarship awards scheme unveiled last year.

BCI said on April 25 a total of $15,000 in scholarships had been awarded to a group of three students — who each received up to $5,000 in financial aid to support their studies in the 2025-2026 academic year.

The BCI Foundation was formed in recognition of BCI's 100th anniversary last March and aims to support the next generation of leaders in STEM and the energy storage industry.

Scholarships fall into two categories. The BCI Battery Chemistry and STEM Scholarship supports individuals studying electrochemistry, science, technology, engineering, mathematics or a related technical discipline that will support energy storage applications.

In partnership with Women in the Global Battery Industry, BCI said it will ensure at least one female recipient, as part of BCI's efforts to foster diversity in the industry.

This year's BCI Battery Chemistry and STEM Scholarship recipients are Sophia Anderson of Pennsylvania and Leaf Evergreen of Oregon.

Meanwhile, the BCI Community Scholarship supports individuals who are an employee or direct family member of an employee currently working in a BCI-member company. Summer Sapp of Kentucky was the 2025 recipient.

The scholarships are administered by the University of the Aftermarket Foundation, a group dedicated to providing funding for aftermarket education programs and research.

The BCI Foundation, a charitable entity, was initially funded in part by a $10,000 'challenge grant' from battery separator specialist ENTEK. Battery separator supplier Daramic provided a separate $5,000.

Additional contributions to the BCI Foundation came from BCI's centennial sponsors. They included Banner, C&D Trojan, Clarios, Crown Battery, Duncan, East Penn, EnerSys, GS Yuasa, Leoch Battery, Moura, Rolls Battery Engineering, Stryten Energy, Superior Battery, and US Battery Manufacturing Company. ■

Maccor promotes Causey, King and Kearns

US battery testing giant Maccor has announced executive promotions for three long-time employees.

Jon Causey, Brian King and Justin Kearns have been promoted to senior vice president positions, reflecting the firm's commitment to driving innovation and growth, Maccor said on March 31.

Causey, who has been with the company for 17 years, will oversee operations at Maccor's satellite locations.

He previously worked as customer support manager for the Western USA region and played a key role in developing a thriving customer support operation in San Jose, Maccor said.

King will lead operations at Maccor's corporate headquarters in Tulsa. He is a 34-year veteran of the company and a former manager of Maccor's manufacturing team, overseeing critical aspects of production processes.

Kearns will oversee global sales and customer support operations from Tulsa, Oklahoma. With 17 years at Maccor, most recently as manager of global customer support, Kearns also has 13 years of experience at Energizer, where he led teams in battery manufacturing and testing. ■

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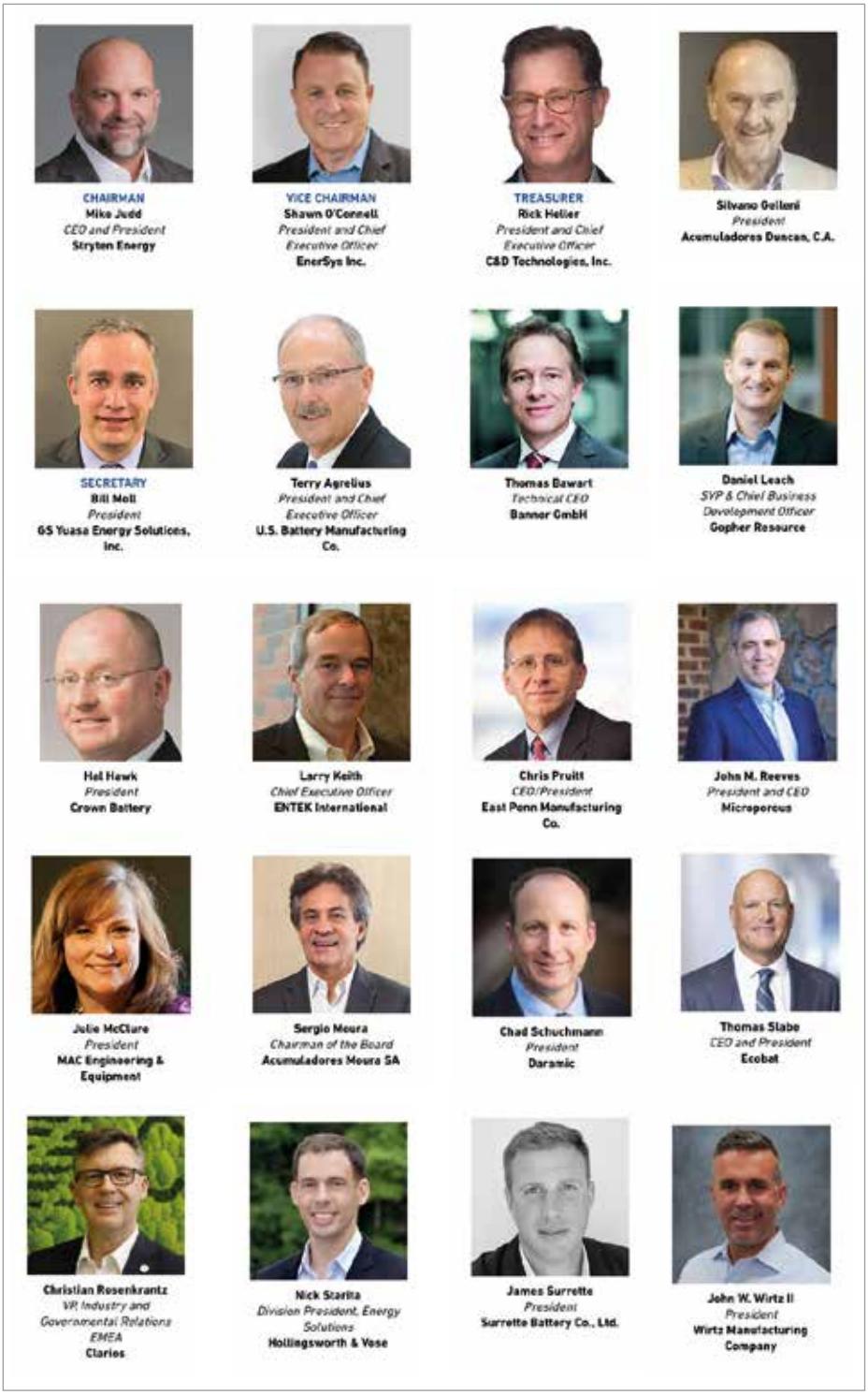
Stryten's Mike Judd takes over as new BCI chairman, O'Connell is vice chair

Stryten CEO and president Mike Judd was sworn in — with the rest of the BCI board of directors — on May 4 of the BCI Board at San Antonio, Texas. Shawn O'Connell, the incoming president and chief executive of Enersys, will become vice chairman.

Other senior appointments within BCI include that of Rick Heller, president and CEO at C&D Technologies/Trojan Battery becomes treasurer. Bill Moll, president GS Yuasa Energy Solutions, becomes BCI secretary.

Judd takes over from East Penn's chief Chris Pruitt who comes to the end of his term in office.



"The battery industry is undergoing a dramatic transformation thanks to new technologies, new trade dynamics, and continued growth in demand for energy storage," said BCI's president and executive director Roger Miksad.

"We are honoured to have Stryten's Mike Judd as our newest chairman, and look forward to his leadership to ensure BCI remains a driving force for innovation and excellence within the battery industry for many years to come."

Also elected to the BCI board for two-year terms were:

- Thomas Bawart, Banner
- Julie McClure, MAC Engineering
- Sergio Moura, Acumuladores Moura
- Chris Pruitt, East Penn Manufacturing
- Christian Rosenkranz, Clarios
- Chad Schuchmann, Daramic,
- Nick Starita, Hollingsworth & Vose

These board members were not up for election this year and will continue as before:

- Terry Agrelius, US Battery Manufacturing
- Silvano Gelleni, Acumuladores Duncan
- Hal Hawk, Crown Battery
- Larry Keith, ENTEK International
- Daniel Leach, Gopher Resource
- John Reeves, Microporous
- Thomas Slabe, Ecobat
- James Surrette, Surrette Battery
- John Wirtz II, Wirtz Manufacturing ■

"We are honoured to have Stryten's Mike Judd as our newest chairman, and look forward to his leadership to ensure BCI remains a driving force for innovation and excellence within the battery industry for many years to come"

One year ago, Michael Ostermann became chief executive of a battery company in a whole heap of trouble. He talks to Shona Sibary about how he's restoring the firm to its former glory.

The turn-around king faces up to the Varta challenge

I am sitting with the man who has been tasked with the not insurmountable challenge of turning around troubled German battery giant, Varta, after its much-publicized financial woes in recent years. And what I'm expecting, if I'm honest, is a stressed executive with five minutes to spare. What I get is someone who wants to talk about motorbikes. And not the electric kind.

"I'm a petrol head," states Ostermann. "I sometimes commute to work on my Harley Davidson." He grins. "I think every man my age should have at least seven."

It's a surprising comment from someone who, almost a year ago to the day, was appointed as the new CEO and board chairman for a company known for its lithium battery production.

But then Michael Ostermann seems keen to throw a curved ball.

"You know Varta is also the world market leader for batteries for hearing aids, right?" he says. "The problem is nobody realises. We don't talk about it. We are doing such a lot of innovation and so much good work, but we are forgetting to tell the world."

His frustration is understandable. Because what the world does know is that last year, after a series of financial challenges, Varta was forced into pre-insolvency restructuring proceedings, resulting into the company's liabilities having "a haircut" from €485 million down to €230 million. At the same time, it received €60 million in new senior loans and a total of €60 million in fresh capital from major Austrian shareholder Michael Tojner and Porsche, who formally each hold 50% of the shares.

As part of the restructuring, the shares of the previous Varta shareholders became worthless and the share capital was reduced to zero, removing Varta from the stock exchange.

"It's been a challenging year," Ostermann says with a wry smile. "As you can imagine, we've been having seven-day-a-week negotiations with lenders. The very first priority for me was to get the financial situation stabilized.

"I'm not arrogant and my door is always open. I treat everybody the same, regardless of their position, income, or social status. I like to think I always see the human and not the job or the bank account"

Reducing the overheads

"We have become a little bit too fat in recent years. We had way too many overheads, and we are now doing some operational restructuring by making the organization and our processes slimmer to be able to make faster decisions, because this has sometimes been too slow.

"Also, the overhead structure was much too heavy. And we are using our part of the fresh money to pace the restructuring. So, that first initial step was made by the end of March where we more or less laid off 10% of our overheads, and we are now working on the second and the third waves.

"But these waves won't be the same magnitude as the first one — not 10% again — but there will still be some adjustments."

Ostermann has a track record in steering firms through financial storms. He was in a similar position when brought in to implement a restructuring at Exide Technologies 15 years ago. Under his leadership there, heading the company's Europe

and Asia division, successful strategies for lithium-ion batteries and energy storage systems were deployed in both sectors. One can't help wondering if he is feeling an overwhelming sense of *déjà vu*?

"Obviously, when I joined Varta it didn't happen by accident," he says. "I was aware of the situation. I knew Mr Toyna from my time at Exide and when he approached me sometime in the autumn of 2023, it was about helping Varta as a consultant.

"With my experience and knowledge in both the battery and automotive industries, this was an area where they needed advice. That was the objective of the first talks. But then he changed course and asked me directly if I would be interested in taking the role of CEO."

Having been out of corporate life for a few years, and, at this point, working for himself as a consultant, was a potential leap back into the boardroom something he relished?

"It took me seconds to decide it was the right move," he says. "But obviously I have a boss at home, my wife. And the Varta office is 500km away from where I live. The same distance, ironically, as Exide, when I lived in Paris during the week. So, it needed to be discussed with her.

"My 10 years at Exide was probably, until today, one of the best experiences of my professional life. I really loved this time; it was very interesting. But I was always a little bit jealous, even then, looking over the fence at Varta, at their brand awareness.

"I found it a pity that such a well-known industrial icon in the battery industry was suffering. Therefore, when I was made the offer, it was really clear to me what I wanted to do."

Does he think there is perhaps something in his management style that makes him the obvious choice for helping stricken battery firms?

"I think I've always been a very accessible, approachable guy," he replies. "When I first left school, I did an apprenticeship for a year as a locksmith and then I went back to university to study mechanical engineering. But that time before still connects me to the people. I'm a very grounded person.

"I'm not arrogant and my door is always open. I treat everybody the same, regardless of their position, income, or social status. I like to think I always see the human and not the job or the bank account.

"And there's no silver bullet. You have to be open minded and listen to your people. You have to be a fast decision-maker because in a crisis, it's important to make fast decisions. You also have to be clear and transparent in your communication."

Focus on the top line

"At the same time, if you're doing a restructuring, you should not only focus on cost but on the top line. Because when you're growing your top line at the same time as lowering your costs, you're doubling the effect of the savings. So, I'm always taking this dual approach with an eye on catching the costs. You have to do both."

So in what direction does he want to take Varta?

"A big one is the energy storage segment," he says. "We are focusing on residential and industrial storage and there are some significant growth opportunities, but regularization is urgently required."

Ostermann pauses. He isn't keen to get drawn into a political debate but acknowledges that a strong blueprint for the company is its home-grown manufacturing capability. This he believes has become ever more crucial with the demand for energy storage.

"When you think about hybrid warfare and all this stuff today, energy infrastructure is critical," he says. "If you have, let's say, a foreign inverter, it can be remotely controlled and switched off. Data is transferred into unsafe data harbors. For me, I would say that the US and China are equal in not being safe data harbors. And this is an important point.

"Varta had a strategy right from the beginning, two or three years ago, when our energy storage product was in the earlier phases, where we knew that the data from our customers, which is collected by the inverter, needed to remain in Europe and not go to the US or China.

"And that is being played out today. Just look at these recent blackouts in Spain and Portugal, and let's see what the root cause was, if they ever find out, and if ever tell us. It potentially proves that using inverters from foreign countries can result in Beijing or somewhere pressing a button and creating a blank out there. And that's terrifying.

"We have big dealers out there approaching us and saying: 'Let's promote this as a German-made bundle because home security has become a top priority.' People are becoming more and more concerned. If we really are following the path of de-carbonisation then electrochemical storage will become the backbone of our power supply. And we should all - as individuals, as a country and as the EU – have a common interest in gaining control over this. We have to play it right."

It's a huge task for a man approaching 60, with no retirement seemingly in sight. Does this bother him?

"I found it a pity that such a well-known industrial icon in the battery industry was suffering. Therefore, when I was made the offer, it was really clear to me what I wanted to do"

"Success is a big driver for me," he admits. "If I recognize that I am doing something and changing something for the good, then I find that a high level of motivation.

"What I'm experiencing, possibly for the first time in my career at Varta, is that workers on the shop floor are giving me frequent and positive feedback. They are approaching me, even as I'm walking by, and coming over to shake my hand. That spurs me to carry on.

"Also, I've got four children. They're all in their 20s and while they've left home, they haven't left my payroll yet." He laughs. "Retirement could be a long way off!"

This will be music to Porsche's ears, who must surely be relying on Ostermann's extensive automotive experience in carving out a joint venture with Varta.

"They have a high interest in securing the supply of our V4Smart lithium ion power cell, which has an outstanding performance," he says.

"You can't find something similar in the battery industry and it's already being used in the Porsche 911 GTS model. And they want to develop this technology further. So, the main motivator for this joint venture for them, is to help stabilize Varta and not have an unsteady minority chair."

"I'm a petrol head ... I sometimes commute to work on my Harley Davidson. Every man my age should have at least seven"

Harley or Ducati?

As our interview draws to a close, Ostermann glances at his watch. He has a dinner appointment tonight and is probably wondering what will get him there quicker? His Harley, his Ducati, or one of the several sports cars he reserves for enjoying at the weekends?

"I'll tell you what it won't be," he jokes. "And that's the motorbike I have for racing. The problem with that bike is two hours of driving and I get three days of pain in my back, my neck, everywhere. I should be fitter."

I dare to suggest he takes one of Varta's company electric cars, but he isn't a fan.

"I don't want to be too political or polemic," he says, "but I still have a very big question mark about EVs. When you have one car with one combustion engine, they have an average lifetime of 20 plus years. In some cases, 30 years.

"With EVs this would be two electric cars with at least three battery specs. And from a CO_2 standpoint, is this a big advantage for the environment? I have doubts and I've never really seen a comprehensive study about it. If you're going to take a holistic approach, there's the sourcing and transport of the materials, the manufacturing process of the battery, the recycling processes and then the limited lifetime.

"In Germany, for example, after 30 years, you get an age on your registration plate for a historical car and that has some advantages for you. You know you're paying less tax. With EVs, I can promise you, you will never, ever, see one single battery electrical car with an age on the number plate in Germany, because none of these cars will reach an age of 30 years."

It's possibly quite a contrary view from a CEO who couldn't be prouder of Varta being one of Germany's biggest lithium-ion battery producers. But one thing's for sure about Michael Ostermann. He's nothing if not optimistic.

"I still believe that mankind will discover that it makes a lot more sense to work together, to find the middle way. And not always seek to get advantages on one side to the expense of others," he says.

"I once read something someone had written about being very concerned about his future because he thought young people were lazy. He wrote that they don't want to work, and they don't want to listen. And do you know who that was? It was Aristotle.

"He wrote that two and a half thousand years ago, raising the same concerns our grandparents raised in 1968 when we had Woodstock, and the same concerns we still have today.

"But I have hope in our intelligence as humans to overcome the challenges we are all facing right now."

Wise words from a CEO who, in just 12 months, can be applauded for steering Varta sensibly down a bumpy road, with both hands firmly on the steering wheel.

Maybe now he can put his foot down and feel the wind in his hair. ■

"I still have a very big question mark about EVs. When you have one car with one combustion engine, they have an average lifetime of 20 plus years. In some cases, 30. With EVs this would be two electric cars with at least three battery specs"

Jimmy Stewart is part of BCI's Half-Century Club, distinguished alumni of the lead battery industry who have notched up five decades of service.

Going strong, 50 years on

It's quite something for anyone working in any industry for half a century to say they are as enthusiastic and excited about their job today as when they started.

But meet Jimmy Stewart, VP for sales at MAC Engineering who is just that. And bullish for the future too.

A quick glance through his resume shows that there's hardly any aspect of the technical side of the lead battery business that he hasn't been involved in. Design. M&A. Negotiation. Project finance. Production, Purchasing. IP. You name it, he's done it.

He's also got the educational qualifications to back up this hands-on experience. These include a masters in computer science to add to his bachelor's engineering qualification and further studies on project management.

In fact, Jimmy's relationship with the battery business goes slightly further back than 50 years.

Aged 15, in 1972, he could be found helping out after school at his dad's place of work at General Battery Corp in Frankfort, Indiana. Here, he'd work on some of the togging machines and parts of that included their maintenance.

He was a bright lad and soon taught himself how to mend the 440V (and dangerous) electrical cabinets but quickly discovered that there were also a great many mechanical things he could fix. What started out small got progressively larger.

By the time of his 18th birthday, he had become a technical assistant working mostly on troubleshooting and repairs on the assembly line.

General Battery had ambitions to speed up the assembly process and this meant increasing automation. Around this time, he was part of the team that brought in the Allen-Bradley Program Logic Controller to the line — effectively the introduction of computing power in managing machinery. Allen-Bradley, which became Rockwell Automation many years later, was at that time perhaps the corporate name in cutting edge automation.

Above: Jimmy Stewart aged 17.
Below: Jimmy & Teresa Stewart on their 25th Wedding Anniversary

Other things were happening in his life too. In 1975 he married Teresa, a sweetheart from high school. They celebrate their golden wedding this year. One year later they had Mark, followed by Jonathan and then grandson David, whom they adopted in 2022.

But Jimmy had been spotted for other talents. In addition to his technical skills he had a good-natured way with dealing with people. Senior management earmarked him for promotion. So, aged just 20, he became the lead technical supervisor for the assembly department.

Around this time his inventiveness — in particular the way he could find further ways to improve technical and software procedures — came to the fore again. He became involved in patent development and management recognised that his skills could be used elsewhere in the organization's five other production facilities.

In 1979 Jimmy recalls being made a job offer that "I just couldn't refuse" but it required a move to the corporate headquarters in Reading, Pennsylvania. This was to upgrade the company's line facilities with the new program logic controllers. And that meant travel, lots of it, and living out of a suitcase for weeks at a time. Nevertheless, a welcome perk for a young man in his early 20s with his first company car.

The template for Jimmy's life was starting to be set. Here, as Mr Fixit for the firm, he was regularly moved around their five manufacturing centres — the City of Industry (Los Angeles), Salina (Kansas), Greer (South Carolina) Reading (Pennsylvania) and Frankfort (Indiana).

It was a life of long car journeys, plane trips and never-ending hotel rooms. "But, nevertheless, I liked it," Jimmy recalls. "Though I missed my family, I was doing a useful job and doing it well. I was respected by both senior management and my colleagues and now had a team of my own to manage."

Jimmy's life was about to change further during the 1980s when the huge wave of lead battery manufacturing mergers and acquisitions engulfed firms large and small. General Battery Corp was absorbed into Exide Corporation in 1987 and in 1991 a joint venture with Yuasa Battery Inc resulted in Exide selling its industrial battery division to the Japanese battery giant.

These years were critical for Jimmy's career which now took off quite spectacularly.

As manager of the Equipment Technical Center he become responsible for much of the design (and the build too) of production equipment for Exide. It was a huge responsibility for any engineer, let alone one in their late 20s.

Perhaps, more importantly, this involved introducing new technologies into the Exide stable. One of his first tasks, working with joint venture partner Yuasa, was to travel to Japan to study the AGM technology that was operational there and then buy and install the equipment to a greenfield site in Hays, Kansas.

His life of international work and travel had begun — and pretty much continues to this day.

During this time, he was used by Exide in other areas of the business such as grid casting and expanding metal production and, very early on, the use and adoption of computer technology in battery formation.

If the joint venture with Yuasa gave Jimmy the chance to show off his mettle to an international audience, the next years took this still further.

Now with the new responsibility as the manager of international special projects he worked with the Exide CEO Arthur Hawkins in a joint venture with Exide to Russia.

He was to spend the next 12 years working, off and on, installing two plants, worth a total of $183 million in remote parts of the country — one in Siberia and another in Kursk. The next project took him to Uzbekistan where not only automotive battery manufacturing, but a lead smelter was installed.

It was a critical moment in the history of the country as president, Mikhail Gorbachev, sought to open up the country to a more modern way of thinking.

"I was privileged to witness the change from Communism to freedom," Jimmy says. "I liked the way the Russian people had a huge heart. In general, I love to learn the culture of the country I'm working in or visiting — new places, old buildings, stunning scenery. I remember happy weekends spent by the beautiful Lake Baikal in Siberia and the times Teresa would travel with me."

In those days in Russia there was a complete lack of western infrastructure. The country was in a state of flux and communication with home was almost impossible. It might take a week to get a phone call to home, but then Jimmy and his team received special permission to have one of the new satellite phones.

Delegation and team on the Russian projects in mid 90's.
Left to Right: John Baranski, Brian Murry, Carl Petzold, Terry Oxenreider, Jan Pennabecker, Jimmy Stewart

He recalls how sometimes they would be greeted in Russia, coming off the airplane steps, but then there wouldn't be a hotel to stay in and they would be put up in nursing homes or individual houses where, of course, nobody spoke English.

"So we needed a Russian interpreter who was also an engineer," Jimmy remembers. "We were setting up factories and whole working environments from scratch."

For the next 20 years, Jimmy's life reads as a catalogue of projects achieved, goals set, patents filed and accomplishments fulfilled. For the last 14 years of his career he was Exide's senior director of global equipment.

He recalls with much affection working with Gordon Ulsh who restructured the company from 2005. "He was the best CEO I ever worked for," he says. "We were all sad when he stepped down in 2010."

But the same problems that had driven Exide into Chapter 11 bankruptcy protection in 2004 resurfaced in late 2018 and by 2019 the full enormity of the company's financial situation emerged.

In May 2020 Exide filed for Chapter 11 again. Jimmy knew the writing was on the wall. They were looking to make cuts everywhere and it was only going to be a question of time before most senior management would be axed in the name of savings.

He left Exide in December 2020. However, as he bid farewell to the company where he had worked for almost 46 years, he was immediately welcomed to a new one by Doug Bornas, president of MAC Engineering.

"I'd known Doug for several years," he says. "I liked him as a person, and we, at Exide, respected the company. It was very well run, and we'd always liked its products. Doug had previously said to me: 'Make sure you call me if you ever think of leaving Exide.' So I did. I said, 'make me an offer so I can stay in Atlanta' and here I am now.

"I'd never thought of myself in sales as well as engineering but I now see it as an extension of my knowledge. I know exactly what customers want and understand the specifications and performance they seek. Being a technical person enables me to match products with needs."

And so, with half a century of battery experience under his belt, what keeps Jimmy going? "The lead battery industry is both a business and a community," he says. "It is perhaps one of the last businesses where there's a sense of family when we all get together.

"I'm so looking forward to BCI this year when I can see all my friends and catch up with what's new."

And tips for international battery men and women in hotels and on the move? "Only drink bottled water, always brush your teeth with Coke and when you're in the shower, never touch the soap if it's orange."

And food? "Well, I've always liked visiting China but the rule there is simple: if you like it, never ask what you're eating!" Now that's sound advice from a man who has more than proved he knows his stuff… ■

It is with sadness that *Batteries International* reports that Norman Bagshaw one of the leading lights in the battery industry in the 1980s and 1990s and a world-renowned specialist on lead batteries in a marine environment died on February 27, aged 91.

Norman Bagshaw, 1933-2025

It was obvious from early on that Norman Ernest Bagshaw was going to go on and achieve great things. But his path was not an easy one.

He was born on May 25, 1933 in Kettleshulme, a small village in Cheshire, England. His father had been badly injured in the Great War and what work he could do was badly paid. His sister Muriel died of tuberculosis when he was six.

But Bagshaw showed early signs of promise. After primary school he won a scholarship to the Kings' School, Macclesfield; one of the best schools in the north of England.

After school, as was the norm in the 1950s, he completed two years of obligatory National Service. His ability to learn was spotted early on and he was assigned to Intelligence Corps where he learned Russian.

This later became useful when meeting Russian speaking scientists at conferences as he could help them with English language. It was also useful later in translating Russian abstracts and also a Russian book, Protective Coatings on Metals by Grigorii Samsonov.

Following National Service he studied the Natural Sciences Tripos at Downing College, Cambridge. He also excelled in sport notably cricket and hockey for his college. His intelligence and diligence made him able to succeed in most things he put his hand to.

Bagshaw was to become the first scientist in his family as well as the first to go to university (or indeed to stay in education beyond the age of 15).

After an initial research job working for a magnesium alloy company he moved to Chloride in 1958 — a year after his marriage to Norma Bradley, who survives him. The two were to have four children together.

Chloride, from the 1950s onwards was the place to be in the lead battery industry. It may have been a sprawling giant with operations across the world but it was also at the cutting edge of battery development

Norman worked alongside Montefiore Barak, the charismatic and academically brilliant head of research at Chloride. He later became head of materials research and also assistant director of research of the labs.

In the early days with Chloride there was a good exchange of views at annual meetings of research personnel from Chloride, ESB (Electric Storage Batteries) in the US and what later became Varta in Germany.

For his first five years at Chloride his work included an examination of lead-antimony-arsenic alloys and the grain refining effect of selenium on these alloys and the first use of selenium as a grain refiner.

Between 1963 and 1968 Norman investigated the properties of lead-calcium and lead-tin-calcium alloys and discovered a method of preventing oxidation of calcium from molten lead alloys by the addition of aluminium.

He also researched lead-barium and lead-strontium alloys and compared these with the properties of existing lead-calcium alloys, as well as developing lead-antimony-cadmium and lead-antimony-cadmium-silver alloys.

In addition to the alloy work, Norman and his team carried out X-ray and microscopic analysis of active materials in battery plates. The structures of lead oxides were clarified by X-ray and neutron diffraction analysis and the ways in which alpha and beta lead dioxide could be formed were elucidated.

In 1968, he was awarded the Hoffmann Memorial Prize at the 3rd International Conference on Lead in Italy, for his findings on lead-antimony-cadmium alloys,

He was largely indifferent to the recognition he was attracting. He later said: "I was never particularly concerned with patents (although I recognised their importance) and left patents to the patent office in Chloride. I don't even know how many patents have my name on."

That said many of his patents are fundamental to the present industry.

"I was never particularly concerned with patents — although I recognised their importance — and left patents to the patent office in Chloride. I don't even know how many patents have my name on."

For example, "Battery electrode structure" patent number: 4125690, obtained in 1978, concerns "a battery electrode structure made of a lead-calcium-tin alloy". He obtained this with John McWhinnie.

That same year, as he received his first international prize, he was transferred to Chloride Industrial Batteries Limited, the company manufacturing lead acid batteries for stand-by applications and also for submarines and aircraft. In addition the company made special silver oxide-zinc batteries for torpedoes.

Following a reorganization he was made technical director and given the technical responsibility for all stand-by, submarine, aircraft and torpedo batteries with all the technical managers and also the quality manager reporting to him.

A further reorganization allowed him to concentrate on defence and aircraft batteries by giving him overall control — including sales and marketing — of these products.

Over these years Norman visited countless companies making submarines, torpedoes, aircrafts and tanks as well as various navies including the navies of Britain, Canada, the Netherlands, Denmark and Egypt.

Chloride had always been a supplier of batteries to the British Navy since diesel-electric submarines were first introduced. He later said: "We extended this to include batteries for air-drop torpedoes. These batteries had magnesium and silver chloride as electrodes and used sea water as the electrolyte. The batteries were prepared with dry plates and when the torpedo was dropped into the sea the electrolyte (sea water) entered the battery.

"Thus the weight of the electrolyte did not have to be carried by the aircraft. One of the disadvantages of the flow-through system is a fall in voltage as the battery discharges. We overcame this by recirculating some of the sea water to increase the temperature and therefore the voltage during discharge. We tested the effectiveness of this innovation in the lab prior to commercialization."

He was happy to share his expertise and in 1982 he wrote the 203-page book *Batteries on Ships*, a standard text on the subject, which was published in January 1983 and in 1986 in Russian. He also edited a series of books on power sources technology" for Research Studies Press.

In 1988 Norman, who had left Chloride the previous year to become an independent consultant, was awarded the Frank Booth Medal by the International Power Sources Symposium Committee for contributions to battery research and development.

During the next decade and a half, he advised a host of companies and government departments in various countries throughout the world on many research projects.

Notable examples include a mission to Syria on behalf of the United Nations to advise on batteries for photovoltaic systems; his work as a member of an advisory committee to the UK's defence ministry for battery requirements into the next century; advising on the development of maintenance free battery for solar power application for a European Commission project; and providing advice to the House of Lords on zero emission vehicles.

Companies he has advised include Atraverda USA, Magneti Morelli in Italy, several battery companies in South Korea which he also visited and he worked closely with HBL (Hyderabad Batteries Limited) in India on some of their new battery projects, becoming a non-executive director of this company for three years. He also performed a critical survey of all the lead-acid work assessed by ILZRO (International Lead Zinc Research Organisation).

Norman was also used as an expert witness in many battery and patent disputes. In one notable case, his name as expert witness was enough to make the opposing company withdraw.

Norman was chairman of the British and IEC Standards Committees on Aircraft Batteries over many years; an Industrial Fellow at Nottingham University for six years, and member of the Court and Council of the University of Manchester Institute of Science and Technology for 17 years.

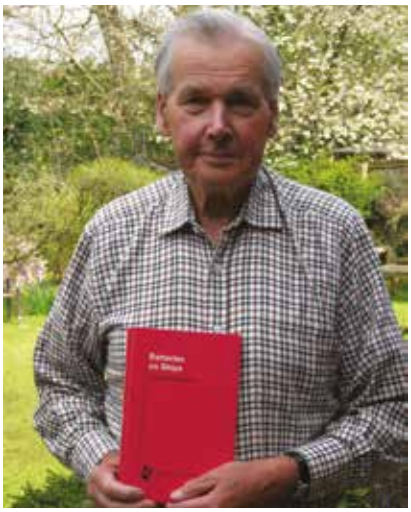
He was a member of the International Power Sources Symposium Committee, member of the Council of Defence Manufacturers' Association (DMA), member of the editorial board of Advanced Metals Technology and member of the Industrial Advisory Committee LABAT, Bulgaria.

In 1999 the Bulgarian Academy of Sciences awarded him the Gaston Planté medal for fundamental contributions to the development of lead-acid battery technology.

In 2003 he received the UMIST medal for sustained and outstanding work for the University of Manchester Institute of Science and Technology.

He has published over 60 scientific papers for professional and technical journals. ■

From left: Detchko Pavlov, John Devitt, Norman Bagshaw and Naoum Yakimov as Devitt and Bagshaw receive the Gaston Planté medal in 1999



Standing besides one of the 400 cells needed for a submarine battery, holding his classic text on the subject: *Batteries on Ships*

The ONE Minute Giveback, a charity initiative that started at the 18ABC in Bali, will be returning to this year's ABC in September in Borneo. Mike Halls reports.

Giving a hand-up to communities in need

There's always something splendid when an organization — whatever kind, but here a conference — gives back a source of its profits for a good and local cause.

Since 2018 the Asian Battery Conference has led the way for the lead battery industry in showing the way that this can be done.

The ABC has made a concerted effort to give back to the communities where it holds the events something that will last after the conference has gone.

"In 2025 we're focusing our efforts on creating a meaningful impact in the local community of Kota Kinabalu — especially for children in need," says Mark Richardson, one of the event organizers of ABC. " It only takes one minute to show you care, but the difference we make together will last a lifetime.

"With the collective support of our delegates, sponsors, exhibitors, and speakers, we remain committed to making a lasting impact on the communities we visit."

SY's Scott Fink, who has helped as an arranger to the previous ONE Minute Givebacks says: "All proceeds from our ONE Minute Giveback will be used to ensure families living in poverty have access to help for disadvantaged children.

"The power of the industry's giving is multiplied in a developing economy because a dollar goes a lot further than in a rich country.

"It's worth noting too is that ABC has conducted extensive due diligence in vetting the probity and need for help with the chosen charities.

"It's also a thank you to the country that has hosted our conference, a legacy to what we leave behind and a reminder to ourselves that we live privileged lives."

This year's ABC looks set to be largest ever. ■

A concert party at the Seri Mengasih Centre

Seri Mengasih Centre: This is a special developmental school that provides vital educational and life skills training to children and adults with intellectual and developmental disabilities — without any government funding. Students as young as four benefit from specialized programs that would otherwise be out of reach. Raising and caring for an autistic child is a full-time commitment and many parents sacrifice their own aspirations in the process.

Kota Kinabalu Children's Home, is an orphanage providing a safe, loving home to children who are orphaned or come from deeply impoverished backgrounds. While it receives some government assistance, additional funding is essential to provide proper care, education, and brighter futures.

Eye witness: the fruits of our giving are real

Batteries International's John Shepherd visited one of the charities supported at the last ABC: the Hospital for Children. He wrote afterwards about his experience.

"I had the privilege of joining a small group of 20ABC delegates on a visit to the hospital. We had been invited to see at first hand how ACH coped and to understand how precious every dollar of support is in supporting the facility's mission to provide specialist care for children across Cambodia with long term, rare or acute conditions.

"One little girl, no older than three or four, was sitting patiently on a bench outside the oncology unit. I nodded and smiled at the girl, who placed her hand into the reassuring lap of a woman sitting alongside her — most probably 'Mom' — before she beamed a smile back.

"It was a smile that belied the undoubted discomfort — to put it mildly — that the child must have been enduring. Her innocent face was cruelly disfigured in a way that requires no elaboration here

"She clearly deserved the urgent care of the medical professionals. I unashamedly shed a tear (which felt to be a wholly inadequate response) and others in the group were equally struggling to keep their emotions in check.

"But for me, the expression of a little girl bravely smiling through, despite her condition, encapsulated the welcoming and hopeful spirit of the entire hospital and the good that our money would do." ■

EU urged to put a halt to REACH 'disincentive' for Pb batteries

EU leaders have been urged to 'stop sending signals' that lead will be banned, which disincentivizes investment in sustainable advance battery technologies, a senior Exide Group executive has said.

Karsten Kurz, Exide's director for corporate social responsibility and governmental relations, said Europe's lead battery industry does not need special assistance — only fair competition and a halt to ever-increasing regulations.

In a March 20 blog post for the Consortium for Battery Innovation, Kurz said Exide's business is based on producing advanced batteries for energy storage using two "essential and complementary technologies", lead and lithium.

He said where new measures are necessary, they should be proportionate and risk based. But on moves aimed at restricting the use of lead under REACH regulations, Kurz said this essentially sends a signal that lead is "banned and acts as a disincentive to invest.

"This approach is highly counterproductive and has to stop. We hope that the REACH revision later this year will consider that.

"Europe needs an eco-system of different battery technologies for a wide variety of applications to fulfil our own needs and to compete globally."

Kurz said the group's technology agnostic approach was key to supporting innovative battery technologies developed in Europe.

"Our message to policymakers is straightforward. Please allow us to continue to operate, to innovate, to compete. We don't seek special assistance. But we do seek a level playing field. We all want to see costs reduced, be they energy or other compliance requirements."

The lead battery industry is not seeking special assistance, only a level playing field, Kurz said. "We all want to see costs reduced, be they energy or other compliance requirements."

A new EU metals action plan, published on March 17, is one example of the need for policymakers to think more broadly, Kurz said.

"It focuses on a few key metals — which are important, like steel — but fails to include the importance of a much wider group of metals like lead which are essential to our competitiveness and our autonomy." ■

Lead battery industry in grid-scale BESS talks at US national lab

US lead battery industry has taken part in talks focused on support for next-generation grid-scale battery storage tech at the US Pacific Northwest National Laboratory.

The PNNL was subsequently the winner of the prestigious Battery Council International Innovation Award at the annual convention in May.

Battery Council International said on March 21 that representatives from leading energy storage companies and three national labs met at the PNNL campus on March 11 and 12.

The meeting was held to map out experiment plans and targets with the goal of improving energy storage and grid-scale battery technology in the US, BCI said.

The event was conducted as part of the Consortium for Lead Battery Leadership, which is a research program managed by BCI.

Developing next generation lead batteries through a research-driven focus on battery life, capacity, and cost-effectiveness was a key aim of the visit, BCI said.

Tim Ellis, BCI's technical director for the Consortium for Lead Battery Leadership, said such public-private partnerships are critical to providing practical innovations in energy storage.

"By connecting key stakeholders at domestic manufacturers with the world-class research capabilities at our national labs and the US Department of Energy (DOE), we can accelerate research timelines and commercialize new products efficiently and cost-effectively," Ellis said.

In April 2024, BCI was awarded $5 million by the DOE to establish the Consortium for Lead Battery Leadership.

The DOE asked the consortium to help research and develop lead batteries that are capable of 10+ hours of storage with a pathway to a $0.05/kWh levelized cost of storage by 2030. The current levelized cost of storage for lead batteries can be as high as $0.38/kWh. ■

Malaysia's Fujiya launches EFBs after China Jujiang deal

Malaysian battery manufacturer ABM Fujiya has confirmed its launch of an EFB production line — just weeks after agreeing a joint venture deal with Chinese lead acid and lithium firm Jujiang Power Group.

Fujiya, which is already a lead battery producer, said the expansion into EFB technology was designed to embrace the market shift toward electric vehicles — and that sector's still heavy reliance on having both lead and lithium batteries.

Fujiya subsidiary Fuya Energy is producing the EFBs at a new plant in Kuching, although production capacity details were not disclosed. However, Fujiya said the move would enable it to remain competitive in both domestic and international markets.

Jujiang's purchase of a 40% stake in Fuya Energy was completed last year, Fujiya confirmed in a Bursa Malaysia announcement on December 27.

Jujiang completed the subscription of 48 million new Fuya Energy shares at Rmb1 ($0.13) each for Rmb 48 million.

The agreement provided a fast and efficient means to settle most of Fujiya's debt to Jujiang, avoiding the need for conventional bank loans or debt financing while boosting prospects as partners, Fujiya said.

In addition, Fujiya said it would benefit from valuable knowhow and feedback on its plant operations and technical improvements.

Combined production capacity of Fujiya before the expansion into EFBs was around 1.6 million units annually, according to the group. ■

Narada reveals battery deals for telecoms and datacenters

Narada Power said on March 13 it had won a bid to supply VRLA batteries with a contract value of Rmb330 million ($46 million) to China Tower.

Details of the contract were not disclosed, but Narada said its lead battery tech will be used in backup power projects and builds on the firm's longstanding business and commercial relationship with the China-based telecoms giant.

Last year, Narada delivered a total of Rmb1 billion of batteries for China Tower's industrial energy storage and battery swapping projects.

Narada said its own technological expertise and increased market share in the energy storage sector had grown alongside the telecoms group's expansion and investment in 5G communications tech projects.

The battery manufacturer has also delivered lithium iron phosphate battery storage systems to China Tower.

Separately, Narada also confirmed on March 13 that it had secured a Rmb1.2 billion deal to supply lithium batteries for a US datacenter for a leading global software firm, although it did not reveal details.

Last October, Narada announced it had signed a procurement contract with a Western Australian energy storage project company to supply lithium battery energy storage systems.

The project, located in Queensland, is valued at approximately Rmb160 million and will use Narada's Center L Plus Liquid Cooling energy storage system. ■

US set to lead uptick in refined lead metal demand

Global demand for refined lead metal is set to edge upwards this year, with the US expected to lead the way in a turnaround from a fall last year, according to latest analysis.

Separately, James Griffiths, lead analyst at CRU said at the recent BCI convention in San Antonio, that he expected the price of lead to remain stable at around $2,100 per tonne in the near term.

The Lisbon-based International Lead and Zinc Study Group (ILZSG) said on April 25 that global demand for refined lead metal is forecast to increase by 1.5% in 2025 to more than 13 million tonnes.

In the US, after falling by 8.3% in 2024, 'apparent' (production + imports-exports + stock) usage is forecast to partially recover by 4.3%.

In Europe, usage in 2024 was impacted by a decline in passenger car production and fell by 4.4%. However, European demand is expected to rise by nearly 2% this year, the group said.

Chinese demand is forecast to increase by nearly 1% this year, after falling by 1.3% in 2024.

Elsewhere, demand is expected to rise in Brazil, India and Japan but to fall in South Korea.

The group said, based on information from ILZSG member countries, the global supply of refined lead metal is expected to exceed demand by 82,000 tonnes this year.

Meanwhile, world lead mine production is forecast to grow by 2.3% to nearly 5 million tonnes in 2025, principally due to rises in China, Mexico and Europe — where the recent commissioning of mining capacity will result in increased output in Bosnia and Herzegovina, Ireland and Russia.

An expected increase in world refined lead metal output of nearly 2% (to more than 13 million tonnes in 2025) will be mainly influenced by rises in China, India, Mexico and the US. In Europe and South Korea, however, production is expected to fall.

The ILZSG did not elaborate on anticipated market activity driving its forecasts, but the organization has told *Batteries International* previously that as the battery sector is by far the main lead-consuming sector, increases in usage would indicate an increase in battery production. ■

Korean auto parts giant invests in lead battery manufacturing

DN Automotive is expanding its lead battery manufacturing in South Korea by building a new plant under an agreement signed with the Busan metropolitan government.

The Korea-based global car parts and battery maker, part of the DN Group, said on February 20 it had agreed to invest KRW 440 billion ($31 million) in the 90,000m² factory project in Busan's E-Park industrial complex.

The total investment cost includes KRW 44 billion for the land purchase and KRW 398 billion for the construction, which is scheduled to start in August 2026.

DN Automotive did not disclose the planned production capacity of the plant. However, it said the facility would realize a significant expansion of existing battery manufacturing it already has in the region — at its Ulsan 1 and 2 factories about 60km to the northeast.

The company said the Busan plant would also boost its plans to become a leading player in the global battery market, having set an overall production capacity target of 10 million units annually by this year.

As of 2022, the firm said its battery business accounted for more than 90% of exports, with major customers including General Motors.

Batteries International reported earlier this year that South Korea was scrambling to shore up the country's faltering EV battery sector with an initial cash infusion worth close to $15 billion, as a global slump in electric vehicle sales was taking its toll on the industry. ■

Clarios supercharges its AGM plans with $6bn in US investments

Global lead battery major Clarios has unveiled a 10-year, $6 billion plan to expand battery manufacturing and help boost US energy and critical minerals independence.

Clarios said on March 3 its strategy, through to 2035, includes increasing production of "low-critical mineral battery chemistries", such as its most advanced AGM batteries and additional cutting-edge energy storage technologies, aimed at reducing reliance on imports while creating new American jobs.

Some $2.5 billion is earmarked for this from the $6 billion total.

Nearly $2 billion will be directed to "advancing American energy and critical mineral independence", by strengthening the nation's supply chain for batteries — essential to start every vehicle in the US, Clarios said.

Every day, America depends on low-voltage starter batteries as an essential component of the US transportation infrastructure used in cars, tractors, semi-trucks, boats and airplanes, including military vehicles, Clarios said.

Securing American energy and critical mineral independence depends upon expanded domestic capacity to process and recover critical minerals essential to starter battery production such as antimony and tin.

"Now more than ever, America must protect its critical minerals and invest in technology essential to energy independence," said Clarios CEO Mark Wallace.

"With our comprehensive strategy, Clarios is driving a major step forward for America's economic security, national security, and personal security of the American people."

Clarios said it would invest nearly $2 billion in critical minerals processing and recovery. It noted that the near-100% recycling rate of used lead batteries in the US was a key plank in the drive to keep valuable critical minerals such as antimony and tin in the country, reducing its dependence on foreign-controlled supply chains.

The battery maker will also invest some $1 billion in next-generation technologies to accelerate development of advanced energy storage for AI and data centres, supercapacitors and AI-driven software solutions to boost efficiency and innovation.

Clarios will also push ahead with its investment in sodium ion batteries and other "leapfrog solutions" that create a competitive advantage for the US.

Clarios operates 16 manufacturing facilities across the US employing more than 5,500 in 32 states and supplying auto manufacturing and the aftermarket across America.

Last year, Clarios expanded production of advanced low-antimony batteries in the US by 1.5 million units. This year, the company has already invested in upgrades to its facility in Oconee, South Carolina, to increase battery component manufacturing capacity by 30 million parts.

Starting in 2026, Clarios will produce its latest battery in Toledo, Ohio, which the group said is projected to supply 745,000 of the most advanced low-antimony starter batteries integral to the production of new American-made vehicles. ■

Leoch secures $21m project deal for data center

Leoch International has won a Rmb150 million ($21 million) contract to supply its lead acid battery tech for a major data center project.

The Asia-based group revealed the deal on March 5, declining to name its customer — except to say the client is among the world's top Fortune 500 businesses.

The client is an existing commercial partner on projects worth a total of Rmb420 million in the past three years alone, Leoch said.

Leoch is scheduled to start delivery of the batteries next month. The company did not disclose technical details but said the power density of batteries to be supplies would be "far better than that of traditional batteries", deploying a high-current resistant design with high-power discharge performance and a products' design life exceeding 15 years.

The latest deal has involved several rounds of rigorous product testing and audits of equipment to be supplied, which Leoch said underlined its technical strength in the field of high-end data center power solutions and acceptance of that by international customers.

Leoch has been making inroads into the data centers sector since making that market part of its growth strategy in 1999. Since then, revenue from its battery supplies to the sector have increased year by year.

The Asia-based battery giant said it has built a network of partnerships and cooperation with internet giants including JD.com, Amazon and communications majors such as China Mobile, China Telecom, Deutsche Telekom, in addition to technology pioneers such as Dawning Digital Innovation and VNET.

Meanwhile, Leoch has built an R&D team based in Singapore focused on the systems software required for its data center business, together with battery and energy management systems also for its lithium battery business.

Separately, the company said on February 27 it had held a ceremony marking the first battery produced on a new 'intelligent manufacturing production' line at its Anhui site in China.

Production and capacity details were not disclosed. Leoch said the line had faced "operational challenges", but work continued to expand production through the year.

Leoch chairman Dong Li told *Batteries International* of plans to spin off the firm's Leoch Energy Inc subsidiary and list the entity separately in the US.

"We want to expand our business in the West, for sure," he said. "We want to get good people in the marketplace and this spin-off will help us. It will make the management of our organization easier because the culture between East and West is quite different."

He said: "Once this proposal goes through our Chinese management can focus just on China and *vice versa*. It benefits everyone both ways and helps the company to grow." ■

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Panicked EU in 'crucial' €1.8bn battery aid

The EU has announced a planned €1.8 billion ($2 billion) financial boost to secure battery raw materials needed to power Europe's automotive industry.

European Commission president Ursula von der Leyen proposed the fresh tranche of funding on March 5 — in an action plan designed to promote greater domestic production of raw materials and steer away from supply chain dependencies beyond Europe, "especially for batteries production".

The EU chief indicated that Europe's cherished green agenda was no longer in the driving seat, as she pledged a more "pragmatic and flexible approach" on emissions targets to ensure development of the bloc's still-nascent battery sector for energy storage and EVs can accelerate.

She said it was crucial that Europe achieves cost-competitive EU cell production that would cover a large part of the supply of batteries and generate European value-added along the supply chain.

The European Commission will also look into "direct production support" to companies producing batteries and "non-price criteria for components such as resilience requirements", although no details were outlined.

Von der Leyen said the Commission had noted clear demand for more flexibility in relation to CO2 targets.

The Commission is drawing up an amendment to its CO2 Standards Regulation for cars and vans this month that could pave the way for car manufacturers to spread emissions compliance requirements over a longer, three-year period, while keeping "the overall ambition on 2025 targets".

The announcement came just weeks after Batteries International reported industry concerns that Europe risked becoming an assembly plant for Asian battery giants — some of which are receiving millions of euros in subsidies for projects that may breach the bloc's own environmental rules.

Fears were raised in a study released earlier this year by European clean transport campaign group, Transport & Environment, which cast doubt on the benefits of European partnerships with Chinese and Korean battery majors.

The group warned in 2023 that auto firms in the European market had secured less than a fifth (16%) of the key battery metals they would need until 2030.

Meanwhile, also on March 5, the Commission unveiled new battery-related waste codes in a bid to conserve critical raw materials.

Environment commissioner Jessika Roswall said black mass will be classified as hazardous waste, which would lead to better control of the material's shipments and a ban on its export to non-OECD countries.

"By keeping black mass longer in the economy we can boost battery recycling and our circular economy." ■

EU's €22.5bn price tag for first battery material projects list

The European Commission has, for the first time, adopted a list of 47 key projects aimed at supercharging EU battery material supply capabilities at an expected total capital investment of €22.5 billion ($26 billion).

The Commission said on March 25 the so-called strategic projects will strengthen the European raw materials value chain and diversify sources of supply.

The projects cover 14 of the 17 strategic raw materials listed in the EU's Critical Raw Materials Act (CRMA), which came into force last May, including lithium (22 projects), nickel (12 projects), cobalt (10 projects), manganese (7 projects) and graphite (11 projects).

EU member states included in the strategic projects list include Belgium, France, Italy, Germany, Spain, Estonia, Czech Republic, Greece, Sweden, Finland, Portugal, Poland and Romania.

The Commission said all projects could benefit from financial support from a variety of institutions as well as expedited permit processing.

In line with the CRMA, the permit-granting process would not exceed 27 months for extraction projects and 15 months for others, the Commission said. Currently, permitting processes can take from five to 10 years.

The Commission revealed last year that the EU supplies just 1% of its own needs for key battery raw materials — and needs a staggering €4.2 trillion of new investment by 2030 to achieve green energy ambitions. ■

GM 'to accelerate battery supply chain investment'

General Motors is to expand beyond cell production in the US by securing access to a clutch of material sources and boosting investment in domestic manufacturing.

Kurt Kelty, VP for battery, propulsion and sustainability at GM, said on April 8 that the company is securing unspecified North American sources for lithium, manganese, and nickel, and investing in localizing production of cathodes, anodes, electrolytes, and separators.

"By 2028, we'll increase North American content in our battery supply chain eightfold," Kelty said.

His comments came at a time of great market uncertainty following US president Donald Trump's actions on potential tariffs in a bid to encourage greater domestic production of batteries and other products and systems seen as key to national and energy security.

Meanwhile, Kelty said GM's new joint venture with Samsung SDI, launching in Indiana in 2027, will allow the firm to produce prismatic cells. He said this was an additional form factor that gives the firm flexibility to deliver the right battery technology to further optimize foreach vehicle and customer need.

GM spends about $7 billion in the US on research and development each year, Kelty said.

"The US has the talent, technology, and investment to lead in electrification. We also have the local demand. By scaling battery innovation, localizing production and supply chain, and delivering more affordable EVs, GM is positioning itself and the US to compete and win on the global stage." ■

EnerSys to close Mexico plant, boost US, Europe lead investment

EnerSys is to close its flooded lead acid battery manufacturing facility in Monterrey, Mexico and switch production to its existing Kentucky plant while expanding capacity in the US and Europe.

The lead and lithium major said on April 1 that the move will boost production of its battery technologies including Thin Plate Pure Lead and lithium ion.

The announcement came just hours before US president Donald Trump unveil eda raft of reciprocal tariffs on countries that impose duties on US goods.

EnerSys said it expects to incur a pre-tax charge of around $20 million on completion of the switch, the majority of which is expected to be recorded in the first half of calendar year 2025, of which $7.6 million is expected to be a non-cash charge from inventory and equipment write-offs.

Cash charges of $12.4 million include severance, decommissioning and cleanup related to the Mexico facility, contractual releases and legal expenses.

Meanwhile, EnerSys will invest $4.5 million to expand flooded lead battery production capacity in its Bielsko-Biala, Poland facility.

The restructuring is expected to deliver an estimated pre-tax benefit of $19 million annually, beginning fiscal year 2027, while ensuring continued product availability and customer support, the company said.

Chief operating officer Shawn O'Connell, who became CEO in May, said: "The closure of our Monterrey facility and the transition of production to Richmond will enable us to optimize our cost structure, maximize near-term IRC 45X tax benefits, and mitigate future risks associated with potential tariffs while reinforcing our commitment to strengthen domestic industrial security."

O'Connell said the move is also a testament to the success of its "maintenance-free conversion journey", which continues to strengthen the firm's position as the market shifts toward higher performance, lower maintenance energy solutions. ■

Leoch posts 20% revenue boost on back of advanced lead

Leoch has reported a near 20% boost in topline growth in annual results for 2024, driven by robust sales of the group's mainstay lead battery technology across global markets.

Revenue was Rmb16.1 billion ($2.2 billion) compared to Rmb13.5 billion the previous year, according to results posted on March 27, while net profit dipped to Rmb564 million from Rmb568 million in 2023.

The Asia-based lead and lithium major reported year-on-year double-digit growth of more than 60% for SLI battery revenue, with sales amounting to Rmb6 billion for the period.

Leoch said sales were fuelled by the launch of new advanced start batteries with extended lifespans and maintenance-free designs, catering to the needs of modern vehicles and equipment.

Meanwhile, the group said it had expanded its reach in emerging markets, particularly in southeast Asia, Africa, and South America, where demand for start batteries was driven by economic growth and increasing vehicle ownership.

However, another key pillar of the group's business — lead recycling — saw revenue fall 20% year-on-year to Rmb1.7 billion.

The decline was the result of several challenges in Leoch's China recycling business, including regulatory changes, market dynamics and the removal of a government tax incentive policy. Leoch said these impacted the group's ability to maintain profitability and expand its recycling operations.

However, margins should increase following new extended producer responsibility rules, requiring manufacturers to ensure higher recycling ratio rates, and moves to stamp out unregulated recycling — in favour of government-approved recyclers such as Leoch.

Leoch chairman Dong Li said: "While deeply engaged in the lead acid battery sector, we are accelerating our strategic transformation towards the lithium ion battery field to seize the historic opportunities brought about by the global energy structure transformation." ■

Sunlight turns to power of AI for battery research

Greece-based Sunlight Group is teaming up with the country's University of Thessaly in a project that will use artificial intelligence in the development of next generation batteries.

The lead and lithium battery manufacturer said on March 31 the collaboration will use AI models to predict key battery parameters and strengthen the group's development of energy storage systems.

Sunlight said the initiative unlocks new opportunities for industrial and research applications that promote efficiency and sustainability, while supporting the next generation of energy technologies.

The battery maker's research team will spearhead the project working with the university's Intelligent Pervasive Systems (iPRISM) research team.

By harnessing the power of deep machine learning, neural networks and AI algorithms, the initiative aims to create tools for analyzing data retrieved from battery cells, training networks, to predict battery status, and developing more targeted and efficient models to improve performance, reduce costs and extend battery lifespan.

Sunlight said the initiative will benefit various sectors, including renewable energy, automotive, battery manufacturing, and research organizations focused on energy efficiency, driving innovation in energy and AI.

Nikolaos Tsiouvaras, CTO of Sunlight, said: "This project paves the way for a new era in the efficient management of energy resources, reaffirming our commitment to cutting-edge AI applications."

Batteries International reported in January that Sunlight expects to boost production efficiency by 40% after a major upgrade of the group's software systems. ■

Global battery market demand hits 'historic milestone' of 1TWh

The global battery market has entered a new phase after demand hit the "historic milestone" of one terawatt-hour annually last year, according to new analysis published by the International Energy Agency.

Meanwhile battery manufacturing capacity worldwide reached 3 TWh — and in the next five years production capacity could triple if all announced projects are built, said the IEA expert commentary released on March 5.

Electric car sales rose by 25% to 17 million in 2024, as the average price of a battery pack for a battery electric car dropped below $100 per kilowatt-hour — commonly thought of as a key threshold for competing on cost with conventional models, the analysis said.

Cheaper battery minerals have been an important driver as lithium prices in particular fell by more than 85% from their peak in 2022.

However, rapid advancements in the battery industry itself are also supporting price declines.

Today, China produces over three-quarters of batteries sold globally, and in 2024 average prices dropped faster there than anywhere else in the world, falling by nearly 30%, the IEA said.

"Batteries in China were reported to be cheaper than in Europe and North America by over 30% and 20%, respectively. Declining battery prices in recent years are a major reason why many EVs in China are now cheaper than their conventional counterparts.

These trends point to a battery industry entering a new phase of its development, says the International Energy Agency. ■

US study reveals $35bn annual economic power of lead batteries

The US lead battery industry is worth more than $35 billion annually to the country's economy, according to the latest analysis released on March 11 by Battery Council International.

The BCI study, published in partnership with independent economic analysis and research firm, EBP US, revealed the industry contributes more than 106,000 jobs — while the total downstream economic impact of all domestically manufactured batteries topped $10 trillion in 2023.

The analysis was built on detailed employment and production information for 2023, reported directly by leading US lead battery firms. It showed an increase in the economic power of lead manufacturing — up from $33 billion recorded in the last study released by BCI in 2023.

In terms of benefits to the lead battery workforce, companies in the sector reported an average annual income of $81,600 across all activities, higher than the national average annual income of over $72,000 across all US industries.

Total economic activity generated by the lead battery industry resulted in $8.6 billion in income across 2023 through wages, salaries, and other income.

According to the study, lead batteries hold more than 30% of the global market, despite the increasing popularity of lithium ion.

Worldwide, lead battery capacity grew by nearly 6% from 2020 to 2023, with SLI products holding the greatest portion of the lead battery market at 47%, followed by stationary (37%), motive (6%) and e-bikes (2%). Other types totalled 8% of the market in 2023. ■

Battery sector at challenging inflection point, report warns

The global battery industry is reaching an inflection point and faces a myriad of urgent challenges if it is to power a new generation of electric vehicles and energy storage systems, according to new analysis.

The Capgemini Research Institute's report released on February 27, based on a survey of 750 senior executives from large battery, automotive and energy and utilities across North America, Europe and the Asia-Pacific region, said that more than 50% interviewed cited difficulties in securing a stable supply chain for battery components and materials as an impediment to scaling production.

The report — '*The battery revolution: shaping tomorrow's mobility and energy*' — focuses on lithium ion and other 'new energy' battery chemistries.

According to the report, 45% cited economic viability and profitability of battery production as one of the hurdles to expanding business. Nearly 60% of battery manufacturers cited concerns over the time required to build gigafactories as a key challenge.

The scarcity of experienced talent represents a challenge for the battery industry, with 60% of organizations saying they faced skills shortages in both battery technology and manufacturing.

Capgemini said its analysis included in-depth interviews with 22 industry leaders such as K V Ramakrishnan, the former director of plant operations (ICE, EV) at Great Wall Motor and General Motors, who warned variations in chemistry between manufacturers was leading to inconsistencies during assembly, while shelf-life constraints caused materials to degrade, contributing to waste.

He said: "Challenges such as temperature control during transportation further complicate matters, as demand fluctuations can affect battery performance and safety. "Even after cells arrive in the host country, rejections during battery pack assembly, along with other repairs, contribute to a persistent 20%–30% supply gap, which, without digital tech adoption, could increase as demand rises."

The report also quotes Yann Vincent, CEO of the Automotive Cells Company, who said gigafactories must secure a fast ramp-up to avoid a "Death Valley" effect, with huge quantities of cash burned to produce cells and modules that will be scrapped for being of insufficient quality.

Meanwhile, 60% of executives told the survey they were tackling skills shortages in battery R&D and manufacturing. ■

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Panasonic in surprise exit from ESS and solar business ... 'not the right fit'

Panasonic said on April 28 it is shutting down its solar and energy storage business line, saying it was "no longer the right fit".

The company gave few details about its reasoning for the move, other than to say it would now focus on areas where it can have the greatest strategic impact.

"We remain confident in the technology and grateful to our partners and customers who have supported this journey."

Naoki Kamo, president of Panasonic Eco Systems North America, stressed in a letter posted online using Reddit that the group was "very much still in business".

"While we continue to believe in the potential of solar and energy storage, it is no longer the right business fit for us at this time."

However, Kamo pledged to continue warranty support and points of contact for all existing customers and customers whose installations are still in the process of being completed.

The announcement came just days after the US Solar Energies Industry Association revealed the 'top solar states' of 2024.

The association said that a decade ago, only three US states had more than 1GW of solar capacity installed, while today 33 states can boast greater than 1 GW of capacity, with more states joining the list every year.

"From the sunbelt to the northeast to the Midwest, solar and energy storage are delivering new opportunities to local economies across the US," the association said.." ■

Gel BESS firm launches charging booster to 'double' battery life

Qurmit, the Dutch firm established to market a lead-gel residential BESS, has unveiled a new charging process claimed to ensure batteries last twice as long as comparable products on the market.

Qurmit confirmed last August it had launched the BESS, based on "tried and trusted lead acid technology", developed by ESS4U and parent firm TSS4U with support from Exide Technologies and the VDL Groep.

The developer told *Batteries International* on April 29 the new 'Qurmit Booster' significantly extends the lifespan of the lead-gel batteries.

Under normal conditions the home BESS can handle up to 9,000 charge cycles (depending on daily usage), effectively doubling the standard charge cycle range specified by Exide Technologies, Qurmit claimed.

This means that the batteries are not only safe and easy to recycle, but also technically on par with lithium ion battery tech.

Qurmit said this performance is the result of over 25 years of battery development experience and extensive testing, even under extreme conditions.

Founder Jan-Willem Linsen said: "Our technology ensures that the batteries not only last longer, but are also more cost-effective for our customers."

In addition to regular home batteries, Qurmit is expanding its offering with larger three-phase battery systems, specially designed for households with higher energy demands.

These home batteries are available in capacities ranging from 17-42kWh and can be directly connected to solar panels, allowing for more efficient charging.

Qurmit has also introduced the Qurmit XL, described as an industrial-grade battery with a capacity ranging from 57-800kWh and a power output of up to 90 kVA/72 kW.

Qurmit batteries, manufactured in the Netherlands, are made of over 50% recycled materials and are more than 95% recyclable, significantly reducing the environmental footprint of energy storage, the company said. ■

Narada eyes ESS market with enhanced solid-state tech

Lead and lithium battery group Narada Power has launched what it described as an ultra-high-capacity solid-state battery to target the energy storage market.

The Chinese firm said on April 10 the 783Ah battery cell marked a breakthrough in its R&D, following the launch of its 20Ah all-solid-state battery in 2024 and later the 30Ah.

Narada said the move marked an advancement in energy density and safety performance through three core technological innovations — flexible biphasic oxide solid electrolyte, multi-layer heterogeneous composite structure design, and in-situ electrolyte film formation technology.

New material used significantly enhances flexibility and mechanical strength, effectively reducing the risk of electrolyte cracking, Narada claimed.

"The electrolyte features a high ionic conductivity of 10^{-3} S/cm, a wide electrochemical window, excellent air stability, and cost-effectiveness, laying a solid foundation for large-scale industrialization."

The proprietary electrolyte film formation tech enables the electrolyte to infiltrate into the electrode and 'self-assemble' into a thin film, creating a flexible coating around the active particles to greatly reduce interfacial resistance.

The cell includes a lithium-conducting (LiCon) functional layer that enables fast ion transport, and a silicon-based interfacial layer that enhances contact between solid components.

Narada said the 783 Ah solid-state battery cell delivers more than 10,000 cycles, single-cell energy above 2.5kWh, energy efficiency exceeding 95%, and volumetric energy density greater than 430Wh/L.

To address the key technical challenges of long cycle life, the 783Ah battery uses a low lithium consumption artificial graphite technology, Narada said.

By controlling the interlayer spacing and orientation of the graphite, it reduces the volume changes caused by lithium de-intercalation, effectively enhancing the stability of the anode structure, with the full-charge negative electrode sheet expansion reduced to 18%. ■

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Lead battery industry in grid-scale BESS talks at US national laboratory

US lead battery industry has taken part in talks focused on support for next-generation grid-scale battery storage tech at the US Pacific Northwest National Laboratory.

The PNNL was subsequently the winner of the prestigious Battery Council International Innovation Award at the annual convention in May.

Battery Council International said on March 21 that representatives from leading energy storage companies and three national labs met at the PNNL campus on March 11 and 12.

The meeting was held to map out experiment plans and targets with the goal of improving energy storage and grid-scale battery technology in the US, BCI said.

The event was conducted as part of the Consortium for Lead Battery Leadership, which is a research program managed by BCI.

Developing next generation lead batteries through a research-driven focus on battery life, capacity, and cost-effectiveness was a key aim of the visit, BCI said.

Tim Ellis, BCI's technical director for the Consortium for Lead Battery Leadership, said such public-private partnerships are critical to providing practical innovations in energy storage.

"By connecting key stakeholders at domestic manufacturers with the world-class research capabilities at our national labs and the US Department of Energy (DOE), we can accelerate research timelines and commercialize new products efficiently and cost-effectively," Ellis said.

In April 2024, BCI was awarded $5 million by the DOE to establish the Consortium for Lead Battery Leadership.

The DOE asked the consortium to help research and develop lead batteries that are capable of 10+ hours of storage with a pathway to a $0.05/kWh levelized cost of storage by 2030.

The current levelized cost of storage for lead batteries can be as high as $0.38/kWh. ■

Malaysia's Fujiya launches EFBs after China Jujiang Power deal

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However, Fujiya said the move would enable it to remain competitive in both domestic and international markets.

Jujiang's purchase of a 40% stake in Fuya Energy was completed last year, Fujiya confirmed in a Bursa Malaysia announcement on December 27.

Jujiang completed the subscription of 48 million new Fuya Energy shares at Rmb 1 (13 US cents) each for Rmb 48 million.

The agreement provided a fast and efficient means to settle most of Fujiya's debt to Jujiang, avoiding the need for conventional bank loans or debt financing while boosting prospects as partners, Fujiya said.

Combined production capacity of Fujiya before the expansion into EFBs was around 1.6 million units annually, according to the group. ■

Yuasa reports 20% rise in profits amid fears of US tariff hikes

GS Yuasa said on May 13 in-creased battery sales drove a rise in operating profit over the past year.

Operating profit before amortization and good-will was up 20% to JPY50 billion ($341 million) for the year ended March 31 compared to 2023 and net sales increased 3% to JPY580 million, accord-ing to the consolidated earnings report.

However, the Japan-based company warned that the outlook over the coming year was uncertain as a result of US tariff policies — and warned of un-specified "downside risks", particularly for the bat-tery giant's overseas business locations.

Nevertheless, the firm's forecast for the fiscal year ending March 2026 anticipates an increase in net sales of JPY600 billion, driven by increased sales of lithium ion batteries for energy storage sys-tems, backup power systems and EVs such as plug-in hybrids and hybrids.

The group's business units include Automotive Batteries-Japan (ABJ), comprising the manufacturing and marketing of lead acid batteries for cars.

ABJ net sales in Japan for the fiscal year ended March 31 totalled JPY102 billion, a year-on-year increase of more than 8%, due to increases in sales and battery prices.

Overseas net sales totalled JPY260 billion, a year-on-year increase of 3%, increased sales in Eu-rope and southeast Asia, as well as the effect of JPY depreciation on foreign exchanges.

Meanwhile, net sales in the automotive lithium ion batteries segment dipped by more than 2% to JPY82 billion, due to a fall in sales for plug-in hy-brids and lower sales prices resulting from falling raw material prices, despite an increase in sales of lithium ion batteries for hybrid vehicles.

Batteries International reported last January that US energy firm Ameren had commissioned a new EV fast-charging station powered by advanced lead batteries from GS Yuasa. ■

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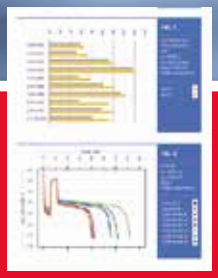
INDUSTRY NEWS

Independent GravityGuard® Testing Reveals Improved CCA & PSoC Cycling

Hammond has released a comprehensive whitepaper detailing exciting findings of new benefits of the anti-stratification additive GravityGuard.® New research shows that the BCI Innovation Award winning product also offers significant serendipitous improvements that may provide additional value to battery manufacturers and their products. Specifically, the results show GravityGuard® used in the PAM and NAM can improve CCA performance, 2C Capacity, and extend PSoC Cycle life. The paper presents notes on evaluation methods, specific comparative data, and more than a dozen charts and graphs with detailed analysis of a wide variety of test results. A PDF is available online. Just snap the QR code above to go to the publication download page.



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CATL unveils fast-charge, long-range EV designs

Chinese battery giant CATL unveiled three transformative EV battery types on April 21, including a sodium ion design with a claimed range of 500km.

All three batteries were showcased at CATL's inaugural Super Tech Day.

They included 'Naxtra' — which the firm claims is the first mass-produced sodium ion battery, boasting 175Wh/kg energy density, a 500km range and over 10,000 cycles.

CATL said the battery "operates flawlessly" at temperatures ranging from -40°C to +70°C, retaining 90% power at -40°C, and eliminates lithium dependency for greater sustainability.

The Naxtra 24V heavy-duty truck battery cuts lifecycle costs by 61% versus lead acid, according to the company.

Meanwhile, the 'Freevoy Dual-Power' battery features a dual-chemistry architecture with two independent energy zones. This product delivers a driving range of up to 1,500km range in sedans and supports new-generation autonomous vehicles.

According to CATL, 'self-forming' anode tech in Freevoy boosts volumetric energy density by 60%, offering tailored solutions such as sodium-LFP or NCM-LFP configurations.

CATL's third innovation, the second-generation 'Shenxing Superfast Charging Battery', is claimed to be the world's first LFP battery with an 800km range and a 12°C charging rate (1.3MW peak power), achieving 2.5km per second of charge. It charges from 5% to 80% in 15 minutes at -10°C, which the company said is double industry standards.

Batteries International reported last November that CATL was introducing a second-generation sodium battery that could operate in temperatures as low as -40C.

Chief scientist Wu Kai revealed in November the move marked a significant leap forward in battery technology, especially for colder regions where traditional lithium-ion batteries may falter. ■

Hong Kong joins flights clamp down on power banks

Hong Kong's aviation regulator has issued a ban on passengers using lithium battery power banks during flights or stowing the devices in overhead compartments.

The move by the Hong Kong Civil Aviation Department (CAD), announced on March 24, comes after several international airlines introduced a strict ban on power banks being used on flights, following onboard fires.

The CAD said the ban came into effect on April 7. Local airlines were then required to stop passengers using power banks to charge other portable electronic devices and/or recharge power banks during flight.

Stowage of power banks in the overhead compartments will also be prohibited from the same date.

The CAD said it was "highly concerned about recent safety incidents suspected to have been caused by passengers carrying and using lithium battery power banks on aircraft".

South Korea has also been tightening rules for power banks and e-cigarettes carried on airplanes in the wake of a fire on an Air Busan flight.

As of March 1, the lithium battery devices were banned from storage in overhead bins and must instead be kept on a passenger's person or in a seat pocket.

Other airlines that have introduced restrictions on power banks include Thai Airways and Air Asia.

Thermal runaway incidents on aircraft soared to a five-year high last year, according to a recent report by the safety and compliance organization Underwriters Laboratories. ■

Electrovaya set for NY battery systems launch

Electrovaya, the Canadian-headquartered lithium ion polymer firm, said on March 3 it is set to launch the first phase of battery system manufacturing in the US next month.

The firm's Jamestown campus, a 52-acre site with a 135,000 ft2 manufacturing facility in New York State, is its first step toward producing lithium ion cells and battery systems in the country, with overall investments estimated to exceed $70 million over the first phase.

The announcement came a day before Electrovaya confirmed it had received a purchase order valued at around $4.2 million for batteries to be used by a cold storage logistics operator in the US to power material handling electric vehicles.

The operator already operates six facilities using Electrovaya's Infinity Battery Technology.

Electrovaya CEO Raj DasGupta said the firm will be one of just a few independent lithium ion battery manufacturers in the US.

In addition to Jamestown, Electrovaya has two operating sites in Canada. ■

China to introduce stricter EV battery safety standards

Updated, stricter national standards regulating the safety of EV batteries are set to enter into force in China in 2026.

The revised standard will take effect on July 1, according to state media outlet Xinhua, quoting the Ministry of Industry and Information Technology.

Xinhua said on April 15 that revisions include updates to thermal diffusion testing of batteries, further clarifying the temperature requirements, observation time, and vehicle testing conditions.

A new 'impact test' has been introduced to assess the protective capabilities of the battery upon impact to its base.

Testing will become significantly more comprehensive, with batteries not allowed to leak, crack, ignite, or explode in the impact test.

Additionally, batteries will need to undergo an external short-circuit test after 300 fast-charging cycles, with no fire or explosion permitted.

The regulations will supersede those introduced in 2020, which only required that an alarm be triggered five minutes before a fire or explosion.

Earlier this year, China said it was increasing subsidies for the replacement of lithium battery e-bikes with new models powered by lead-acid batteries, "given the higher safety performance and broader applications of lead-acid battery e-bikes". ■

Northvolt files for bankruptcy in Sweden but could struggle on

For the record, troubled Swedish battery developer Northvolt said on March 12 it had filed for bankruptcy in Sweden amid concerns that a safety investigation started almost two years ago would implicate senior executives including its CEO.

The company said it had taken the decision following an exhaustive effort to explore all available means to secure a viable financial and operational future.

Northvolt said that like many companies in the battery sector, it had experienced a series of compounding challenges in recent months that eroded its financial position, including rising capital costs, geopolitical instability, subsequent supply chain disruptions, and shifts in market demand.

Several factors contributed to Northvolt's downfall, including high costs, competition from established Asian battery manufacturers, and potentially flawed business strategies.

The company also admitted significant internal challenges in its ramp-up of production. These included those expected by engagement in a highly complex industry while others were "unforeseen".

A Swedish court-appointed trustee will now oversee the sale of the business and its assets and settlement of outstanding obligations.

With Northvolt filed for bankruptcy, there is nevertheless hope that the company might be able to continue operations under the Swedish bankruptcy process, potentially with new funding.

Northvolt's failure is seen as a blow to Europe's ambitions of establishing a domestic battery industry capable of challenging Asian dominance

The announcement comes four months after Northvolt AB and some of its subsidiaries in the US filed for Chapter 11 bankruptcy protection in that country,

Northvolt said on March 12 that Northvolt Germany and Northvolt North America are not filing for bankruptcy in their respective jurisdictions.

"As wholly owned subsidiaries of Northvolt AB, any decisions regarding those entities will be made by the court-appointed trustee of Northvolt AB in consultation with the group's lenders at the appropriate time."

Tom Johnstone, interim chairman of Northvolt's board, said: "For me personally, it remains key for Europe to have a homegrown battery industry, but it is a marathon to build such an industry. It needs patience and long-term commitment from all stakeholders."

Earlier this year, Northvolt admitted it had been importing cathode active material from overseas — after a documentary cast doubt on the firm's sustainability credentials. ■

Porsche joins liquidity boost to put Varta on road to 'solid' future

Varta has unveiled a multi-million-euro liquidity boost in the latest steps of a restructuring plan that "guarantees" battery tech production and research in Europe.

The company said on April 1 it had completed a strategic realignment of its finances and announced two new indirect shareholders — billionaire Austrian entrepreneur Michael Tojner and the automotive Porsche.

In addition to a cash and non-cash capital increase of €60 million ($65 million) the shareholders provided new financing of €60 million which significantly strengthened liquidity, Varta said.

Meanwhile, debt has been "significantly" reduced to €230 million, as the company moves to implement restructuring measures by the end of 2027.

CEO Michael Ostermann said Varta was now financially solid and future-proofed with strong new shareholders.

Tojner, who is already the chairman of Varta's supervisory board, said: "Despite recent challenges, I remain confident in the company's market potential and technological strength."

He said a strong battery manufacturer was essential for Europe and Germany.

Jochen Breckner, member of the executive board for finance and IT at Porsche, said the firms had already successfully demonstrated their innovative strength by collaborating in the field of ultra-high-performance lithium ion round cells.

"As a new shareholder, we aim to play our part in maintaining and further developing important future technologies in Germany."

Sebastian Rudow had joined VARTA's executive board as chief transformation and restructuring officer (see our People News section)

His appointment was the latest part of the restructuring team that Ostermann, charged with returning the once-giant manufacturing firm into profit, had made since he took over as chief executive in May 2024.

Rolf Glessing was appointed chief financial officer at the company last February. ■

Europe's BESS park expands to 61GWh despite slower growth

A total of 22GWh of battery energy storage systems was installed in Europe in 2024, marking the 11th consecutive year of record breaking-installations, according to new analysis.

The increase in the BESS park lifted Europe's total battery fleet expand to more than 61GWh, said trade body SolarPower Europe in its European Market Outlook for Battery Storage report released on May 7.

However, the annual growth rate slowed down to 15% in 2024, after three consecutive years of doubling newly added capacity.

Meanwhile, the BESS market in Europe is set to grow faster in the coming years, although not at the levels required, the report said.

In the most-likely scenario for 2025, 29.7GWh of battery storage will be installed in Europe, representing a 36% annual growth.

By 2029, the report anticipates a six-fold increase to nearly 120GWh, driving total capacity to 400GWh — including a combined 334GWh for the 27 states that comprise the European Union (EU-27). But this this remains far below the levels required to meet flexibility needs in a renewable-driven energy system.

According to SolarPower Europe's Mission Solar 2040 study, EU-27 BESS capacity must reach 780GWh by 2030 to fully support the transition.

Walburga Hemetsberger, CEO of SolarPower Europe, said now was the time for Europe's political leaders to put batteries at the centre of a flexible, electrified, energy system.

"We urge the European Commission to double-down on their efforts here and come forward with an EU Energy Storage Action Plan as part of a broader energy system flexibility package."

Hemetsberger said the recent electricity outage across Spain and Portugal was a stark reminder of why this was important. ■

UK alert over 'worrying surge' in Li battery fires

UK firefighters are tackling at least three lithium ion battery fires a day, following a 93% surge between 2022 and 2024, according to research published by business insurer QBE on May 27.

E-bikes are a major contributor, being linked to nearly 30% of all recorded lithium ion battery fires in 2024, according to analysis of data acquired by QBE under Freedom of Information requests to UK fire services in March 2025.

E-bikes accounted for 362 fires in 2024, compared to 181 in 2022. QBE said that equated to the nation's fire services tending to an e-bike fire almost every day last year.

London accounted for almost a third of all lithium ion battery fires in the UK (31%) and nearly half of all e-bike-related fires (49% or 178 incidents) in 2024.

Between 2022 and 2024, fires involving EVs rose by nearly 80% (131 to 232). While the number of EVs on the road have more than doubled in the same period, the risk from EV fires is substantial due to their fire intensity and speed of ignition and spreading caused by lithium-ion batteries, QBE said.

For those fires whose location was recorded, the most frequent one was residential properties, followed by outdoors and commercial premises.

Adrian Simmonds, practice leader for property risk solutions at QBE, said: "Lithium ion battery fires continue increasing at a worrying pace. These fires burn differently, they take longer to tackle, typically need 10 times more water to put out and are often more harmful to the surrounding environment." ■

Indonesia loan to expand battery materials capacity

Indonesian nickel producer Merdeka Battery Materials has secured a $1.4 billion loan for construction of a chemicals processing plant in the country.

The company said on February 24 the loan will help finance the building of a high-pressure acid leach (HPAL) plant, in the Indonesia Morowali Industrial Park, to produce nickel or cobalt chemicals as part of the EV battery production process.

A group of Thai and Indonesia banks provided the funding as part of a seven-year loan. The total cost of the project is around $1.8 billion.

Merdeka said the plant is designed to have a nameplate capacity of 90,000 tonnes per annum (tpa) of contained nickel in mixed hydroxide precipitate (MHP).

Sulawesi Nickel Cobalt, which kick-started construction of the facility in January, will also operate the plant, adjacent to an existing HPAL with a 60,000tpa capacity of contained nickel in MHP. That plant is operated by Huayou Nickel Cobalt — a joint venture led by China-based Zhejiang Huayou Cobalt.

Merdeka president-director Teddy Oetomo said the new development would boost the firm's goal of producing downstream battery materials to fuel the Indonesian government's plans to expand domestic minerals and processing. ■

Priority' designation for US lithium extraction project

Plans to construct a US lithium extraction facility to help expand domestic battery material production have been designated as a federal priority project.

The South West Arkansas Project in Arkansas supports the construction of a site that will produce battery-grade lithium carbonate from lithium-rich brine in North America, the Federal Permitting Improvement Steering Council announced on April 18.

The council said the facility is part of the first wave of critical minerals projects following Donald Trump's executive order, published on April 15, in which the president instructed his administration to analyze critical mineral supply chains and propose ways to ramp up domestic production while reducing reliance on imports.

The Arkansas project led by Smackover Lithium, a joint venture of Standard Lithium and energy firm Equinor, is spread across Lafayette and Columbia counties in the southwest of the state.

According to Smackover, the site boasts one of the highest-grade lithium brine resources in North America, with a maximum concentration of around 597 milligrams per litre and an average of 437 mg/L.

Standard Lithium CEO David Park said the designation meant a streamlined permitting process, combined with federal support. ■

Portugal lithium project injunction overturned

Lithium developer Savannah Resources has restarted field work and drilling at its Barroso Lithium Project in Portugal after a precautionary injunction filed by landowners was overturned.

UK-based Savannah said on February 21 in a London Stock Exchange announcement that the move came after the Portuguese government helped it overturn the injunction.

The legal action related to a temporary land easement order, approved by the government last December, which gave Savannah temporary access to land which it does not own at the project. The access was to conduct fieldwork for the project's definitive feasibility study and environmental licencing process.

However, the government filed a 'reasoned resolution', citing wider public interest, which led to a court lifting the injunction.

The company said it will now make up time lost during the enforced two-week stoppage.

Barroso is set to be the most significant deposit of spodumene in Europe, Savannah has said.

In 2023, the company said the project could have sufficient lithium production to support production of about 500,000 EV battery packs annually. The company will issue an update on progress at the site in the second half of the year. ■

Korean $300m loan renewed for Trafigura battery metals supply

Trading house Trafigura has secured a renewed $300 million loan from the Export-Import Bank of Korea for battery-related metals supply.

Trafigura said on March 3 the renewed three-year facility will help it keep a "stable supply" of critical minerals such as cobalt, copper and lithium flowing to South Korea — which has been ramping up support for the country's battery sector following a global slump in EV sales.

The loan renewal was coordinated by Spain's Banco Santander and co-financed with Singapore's DBS Bank.

Trafigura's chief financial officer for Asia Pacific, Andrew Starkey, said the battery metals market was complex and rapidly evolving. He said the group was uniquely positioned to provide South Korean industrial companies with secure access to critical minerals

The facility was initially put in place in December 2021 and increased in May 2023. ■

Terrafame unveils €100m battery chemicals financing deal

Battery chemicals firm Terrafame has announced a €100 million ($107 million) financing deal to fund its investments over the next few years.

Finland-based Terrafame said on February 27 that its main owners, the Finnish Minerals Group and Galena funds, had agreed the financing arrangement comprising a €50 million shareholder loan and a €50 million equity financing commitment.

In addition, Terrafame has agreed on a €50 million advance payment arrangement with trading house Trafigura.

Terrafame said it had also agreed on a one-year extension to the maturity of an existing €250 million bank loan agreement as well as on extending a €65 million revolving credit previously received from Finnish Minerals Group for the same period.

The new maturity of the bank loan and the revolving credit ends in December 2028. ■

Post-blaze flare ups warning at Moss Landing BESS

For the record, the US Environmental Protection Agency has warned that additional flare ups at Vistra's Moss Landing BESS plant were still possible for a couple of weeks afterwards, as work continues to de-link the remaining batteries following the major fire in January. The policy warning is consistent with other large scale lithium fires.

The EPA said on February 22 that the work at the 300MW facility in California had begun and was expected to take about two weeks.

De-linking around a third of the battery modules will create a safer, more stable condition by removing the electrical connection between the modules and racks.

The process involves unbolting metal plates that connect the batteries in a series, in the first step of what the agency said will be a lengthy process to safely remove the batteries and begin demolishing the building.

Round-the-clock fire watch and air monitoring continued throughout the demolition process.

Meanwhile, the exact cause of the $500 million estimated blaze remains unknown, according to a dedicated website set up to inform on progress at the site.

Proposals by the California Public Utilities Commission to compel energy storage system owners to report safety-related incidents such as injuries, fatalities, thermal runaways, fires, or other system failures — which they are not required to do at present — has been formally discussed by the body. ■

Advanced lead 'critical' to European security, says CBI's Telford

European leaders have been urged to embrace an ecosystem of battery technologies — including advanced lead batteries.

Carl Telford, research and innovation director at the Consortium for Battery Innovation, said in a recent speech at the European Parliament that decision-makers should value what exists in Europe and help companies to invest, grow and thrive.

In his speech, which the CBI posted online in full on April 10, Telford said:

"Support battery energy storage systems of all 'flavours', as part of an integrated and flexible energy grid — the foundation of affordable energy."

He also called on parliamentarians to help create the best possible conditions for battery makers based in Europe to innovate and invest through proportionate regulation, access to finance and ongoing research funding.

"The European energy storage industry is already an impressive space. From Germany, to Portugal, Italy, Bulgaria and more, I have travelled and visited advanced lead battery manufacturing facilities across the continent.

"Combined, we have a pan-European multi-gigawatt production capability at our fingertips. Today. These batteries are used in a wide variety of mission-critical applications, not just car batteries but also renewable energy systems, backup power, peak shaving, nuclear power plant operation, and defence applications such as tanks or submarines."

Telford said lead batteries are critical to European security and a key piece in the geopolitical and economic jigsaw puzzle that is the EU's Clean Industrial Deal and the Affordable Energy Action Plan.ase in battery production. ■

Electric plane Eviation 'grounds operations'

US all-electric airplane start-up Eviation has reportedly grounded all operations as a temporary measure after failing to attract new funding.

The company, which moved to Washington state after its founding in Israel in 2015, is understood to have laid off most of its staff, two of the employees affected told The Seattle Times on February 14.

"The company is pausing operations indefinitely, most of the engineering team is gone," one of the employees told the journal.

Eviation flew the first flight of its 'Alice' aircraft in 2022 — flying for eight minutes at an altitude of 3,500 feet.

The company completed what it called a conceptual design review of Alice last April. CEO Andre Stein said then that the firm had made "tremendous strides toward making the electric aviation revolution a commercial reality".

In October, the company signed a letter of intent to supply up to 20 of the firm's 'Alice' all-electric commuter aircraft to UrbanLink Air Mobility in Florida.

Eviation said Alice is powered by two magni650 electric propulsion units from Washington tech developer magniX, with battery support from Austria-based AVL.

The firm has said previously its goal is to serve the commuter and cargo markets, operating flights ranging from 150-250 miles. ■

Sumitomo Electric in redox first for Japan power project

Sumitomo Electric Industries' redox flow battery tech has been selected to support a pioneering grid-scale power stabilization system under construction in Japan.

Sumitomo said on March 28 the project for renewables developer Shin-Idemitsu on the island of Kyushu, marks the first redox flow battery to be approved under a grid-scale batteries subsidy program set up by Japan's Ministry of Economy, Trade and Industry and the Agency for Natural Resources and Energy.

The battery will be installed at the Nagasu Energy Storage Facility in Kyushu, the southernmost of the four major Japanese islands, with a capacity of 8,000kWh (2,000kW × 4 hours). Construction has already started and completion is scheduled for October 2026,

The subsidy program boost for BESS follows a major expansion of solar power in the region. As a result, solar power supply has exceeded the surrounding areas' electricity demand during the daytime, becoming a challenge.

Financial details of the project were not disclosed, but Sumitomo said its redox flow battery was chosen for its long lifespan, durability and reduced risk of fire.king its toll on the industry. ■

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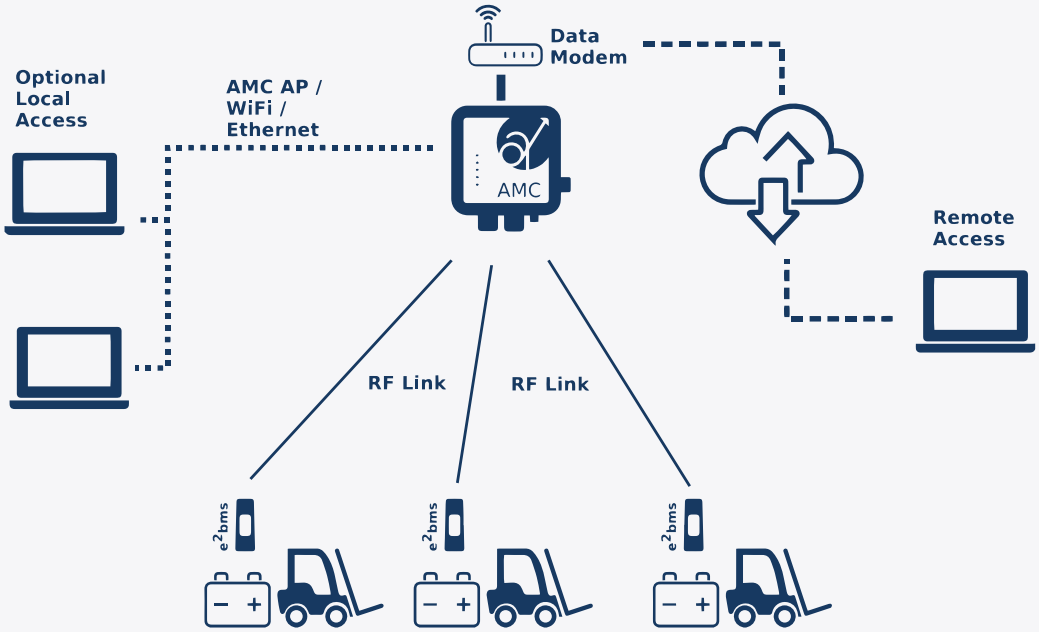

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Stryten BESS long duration in Georgia

A lead battery storage system from Stryten Energy has been installed as part of a major new energy research project at the Georgia Institute of Technology campus in the US.

Stryten said on April 23 that the BESS has been installed at the Carbon Neutral Energy Solutions Laboratory (CNES) on the campus in Atlanta. Further details on the size, cost and expanse of the project were not revealed.

The installation aims to create a living-learning lab that supports research and real-world applications of medium-duration energy storage solutions, Stryten said.

"A lead BESS was selected for this initial installation due to its cost-effectiveness, high discharge rates, and recyclability, backed by extensive research demonstrating its reliable performance."

The BESS is a dynamic storage system that integrates renewable energy sources into the existing power mix, providing stable and dependable backup power and reducing grid dependency during peak hours.

With its additional components and software, the system is capable of bi-directional charging, allowing current to flow into the battery for charging and out of the battery to power the grid or microgrid.

Scott Childers, VP of essential power at Stryten Energy, said: "With the introduction of this BESS, powered by lead batteries, we see behind-the-meter applications getting their day in the sun."

The project will also highlight the advantages of lead BESS facilities in terms of cost savings, technology, environmental and safety perspectives, Childers said.

Richard Simmons, director of research and studies at Georgia Tech's Strategic Energy Institute, said the BESS was "an enabling piece of the distributed energy resources puzzle".

At the CNES lab, researchers can now control charging and discharging cycles for the battery in coordination with an existing solar PV array and a new EV charging test facility, he said.

"This research tool will allow the time-shifting of peak solar input by several hours to meet late afternoon building loads and store renewable energy for the overnight charging of campus vehicles."

Simmons said it was hoped that the lead BESS will be one of several similar battery pilot projects at Georgia Tech, with lithium ion and flow batteries also being considered.

Exide Technologies secures ISO certification for production, shipping

European lead acid manufacturer Exide Technologies has achieved ISO 27001 certification for information security management covering activities including battery production and shipment.

The company said on February 20 that the Spanish Association for Standardization and Certification (AENOR) had awarded the certification following evaluation of all processes and security systems.

The certification also covers IT and networking services and internal services such as sales, marketing and finance.

MAC Engineering in CMWTEC parts supply boost for US

MAC Engineering said on March 19 it is expanding the availability of CMWTEC spare parts in the US.

Spares are now available for direct shipment and owners of CMW battery production equipment can order directly from MAC Engineering and receive shipments from Benton Harbor, Michigan — which will eliminate delays in international shipping and customs.

For the past two years, MAC Engineering has provided direct shipping of Inbatec (now Kustan) spare parts within the US, which the company said has streamlined access to essential machine components.

Building on this success, MAC Engineering said it is committed to extending the same level of service and convenience to CMWTEC customers.

With this new availability, customers in the US can now place orders for CMWTEC spare parts by phone or email.

By ordering directly through MAC Engineering, customers can avoid international logistical challenges, ensuring faster delivery times and reduced costs.

India must expand robust lead battery tech, says Luminous chief

Advances in lead battery technology can boost India's energy sector, promote sustainability and strengthen the country's role as a global battery leader, the head of Luminous Power Technologies has said.

CEO and MD Preeti Bajaj, who became president of the Indian Battery Manufacturers Association (IBMA) last year, said the organization's priorities included making the lead battery supply chain one of the most robust.

Seri in €150m loan to expand Italian LFP plant

Italy's Seri Group has secured a syndicated loan of €150 million ($170 million) to help fund development of an 8GWh LFP battery manufacturing plant near Naples.

Seri said on April 8 the loan will support the cost of its Teverola 2 project, which is being built on the same industrial site as its pilot 0.35 GWh/year Teverola 1.

The pooled loan was backed by several international financial institutions.

Seri already produces LFP cells and modules at the site for ESS systems, motive power, naval and electric mobility applications.

Teverola 2 will also have a pilot line for the recycling of spent lithium batteries, processing around 50 tonnes of end-of-life batteries daily.

Ecobat installs backup gel batteries for Irish power plant

Ecobat Battery has installed more than 200 specialized lead acid batteries to provide backup power as part of a major overhaul of a power station in Ireland.

Ecobat said on March 20 the Sonnenschein A600 gel batteries, which are manufactured by European lead major the Exide Group, were selected to provide backup for the Huntstown power station and installed in the second phase of the infrastructure project.

The new 2,190Ah batteries, each weighing 160kg, were installed on the second floor of the 404MW combined gas turbine power station operated by Dublin-based utility Energia.

Financial details of the battery replacement contract were not disclosed, but Ecobat Battery operations manager, Matt Davies, said: ""The Sonnenschein A602/2200HB blocs we selected were a perfect solution, so it was the logistics of the project

that set us the greatest challenge."

Davies said Ecobat worked with heavy lifting specialist Mastiff Engineering on the project, which involved gaining access to the station's battery room via a second-storey external door.

The entire project was completed within a two-week routine station maintenance outage, Ecobat said.

SK ON boosts fortunes with Nissan supply agreement

SK ON said on March 19 it had signed a battery supply deal with Nissan Motor for vehicles to be produced in North America.

Supplies of almost 100GWh of US-made batteries are set to start in 2028 through to 2033.

SK ON, a subsidiary of South Korea-based SK Group, said its high-performance, high-nickel pouch cells will power Nissan's next-generation EVs to be produced at its Mississippi assembly plant.

India's AmpereHour Energy secures $5m capital boost

Indian energy storage start-up AmpereHour Energy said on March 12 it had raised $5 million in a series 'A' funding round

Pune-based AmpereHour said in a LinkedIn post that it would use the fresh capital from the round, led by Avaana Capital with participation from UC Impower and existing angel investors, to accelerate deployment of its energy storage systems, expand manufacturing capabilities, enhance R&D and broaden its product offerings.

Some 40MWh of BESS projects have already been commissioned using the firm's technology, with about 1,000 MWh under development, AmpereHour said.

Amara Raja's India 'giga corridor' project gathers pace

A foundation stone has been laid marking development of four manufacturing units in India's Telangana state that will form part of Amara Raja Energy & Mobility's battery 'giga corridor'.

The units will be involved in the refining of critical materials and battery recycling associated with the lithium battery cells project, India's electronics and IT minister Shri Ashwini Vaishnaw said at the ceremony on March 8.

He said: "Electric mobility remains a focus area for the government and we are committed to developing the right infrastructure and ecosystem for the promotion and adoption of EVs," the minister said.

"We welcome Indian innovation and manufacturing initiatives and look forward to the success of this endeavour."

JLR backs AC vehicle to grid trial for EVs in the UK

Jaguar Land Rover (JLR) is supporting a trial UK scheme to deploy next-generation vehicle-to-grid EV workplace charging using lower cost AC technology rather than DC.

Denbighshire County Council in Wales said on May 13 it is one of the first fleet depots to have new V2G charger installed under the V2VNY (Vehicle 2 Volume eNergy Yield) project.

JLR is providing prototype EVs for the project, which is being led by Hangar19, in partnership with UK artificial intelligence tech firm CrowdCharge and EV leasing specialist DriveElectric.

Hangar19 is a UK engineering company involved in the supply of EV equipment and specialising in EV chargepoint infrastructure. The firm claims to have developed the first multi-socket AC bi-directional charger on the market.

The V2G charging on the V2VNY trial is being simulated and optimized using systems from CrowdCharge.

V2VNY is also looking at how battery capacity can be used to improve how, where, and when energy is used, with the aim of reducing carbon emissions and saving energy costs.

The council is using a Kia EV6 electric car with vehicle to load capability for the trial. The EV6 is tasked with a wide range of duties and has performed faultlessly to date, the authority said.

The trial aims to demonstrate a commercially viable way for fleet owners, businesses and EV drivers to save money and carbon, and for the UK to reduce the load on the electricity grid at peak times.

Hangar19 said V2G has historically only been possible with EVs featuring CHAdeMO (DC, or high power) charging technology, as featured on the Nissan LEAF.

Virtually all of the latest EVs now use CCS (DC) charging technology rather than CHAdeMO. V2VNY trial is harnessing AC bi-direction technology, which Hangar19 said is more efficient at low power and better suited for the use of V2G in a workplace or at home.

The project is backed with funding through the Innovate UK government agency from a £1 billion ($1.3 billion) net zero innovation funding pool. ■

EnerSys CEO Shaffer bows out highlighting tariff turmoil impact

EnerSys has revealed that its stock lost and regained $900 million in the marketplace over a three-month period amid the recent flurry of US trade tariff announcements.

But outgoing president and CEO David Shaffer said in an earnings call on May 23: "The truth is nothing really changed. Our business potential is still there."

However tariffs end up, "we've got it", Shaffer said.

Shaffer's comments came as he presented fourth quarter and full fiscal 2025 year results ahead of his retirement.

He said net earnings for the 12 months of fiscal 2025 were $364 million, or nearly $9 per diluted share, compared to $270 million ($6.50) in the previous year.

Batteries International reported last December that Shaffer would be succeeded by Shawn O'Connell, president of the company's energy systems global business. O'Connell formally took over on May 23.

O'Connell told the earnings call that should tariffs continue to remain high for Asia-based lithium or incoming lithium cells, this could be a benefit to the firm's thin plate pure lead (TPPL).

"That gets you most of the way of lithium without some of the downside risk and safety considerations," he said.

"We could actually see an uptick in our TPPL offering should that tariff environment stay robust on lithium."

Pakistan's Alaska launches graphite battery line, plans expansion

Pakistan-based Alaska Batteries has launched the brand's first graphite lead acid line.

Alaska, a subsidiary of Islamabad's SMJ Industries, said on May 7 that the new advanced graphite additives range offers increased performance and lifecycle.

The company claims its proprietary graphite-enhanced battery plates offer up to 30% longer service life, faster recharging, superior heat resistance catering for Pakistan's climate and consistent power delivery for vehicles, UPS, and solar systems.

Meanwhile, the firm said it is laying the groundwork for expansion with new regional after sales offices to be set up nationwide by next year.

Alaska said it also intends to introduce maintenance free, tubular battery technologies and lithium ion products, while expanding regional exports within the next two years.

RGE, TotalEnergies, co-invest for Indonesia solar-BESS plant

RGE and TotalEnergies are to develop, build and operate a utility-scale solar-BESS facility in Indonesia's Riau Province.

The firms have entered into a co-investment agreement through their equally-owned joint venture Singa Renewables.

The deal was signed in Indonesia on May 28 in the presence of the country's president, Prabowo Subianto, and French president Emmanuel Macron.

Financial and technical details of the plant, which will be built in two phases, were not disclosed.

However, Helle Kristoffersen, TotalEnergies' Asia president and executive committee member, said the project would support development of regional renewable energy infrastructure and advance the wider ASEAN region's power grid development.

The plant is expected to become a significant energy supplier for domestic consumption and also export energy to Singapore.

RGE, a global group of companies in the bio-based resources and energy sectors, is headquartered in Singapore. TotalEnergies owns French battery manufacturer Saft.

TotalEnergies announced earlier this year that it was investing €160 million ($173 million) in six new battery energy storage projects in Germany.

Last February, Indonesian nickel producer Merdeka Battery Materials said it had secured a $1.4 billion loan for construction of a chemicals processing plant in the country.

The company said the loan would help finance the building of a high-pressure acid leach (HPAL) plant, in the Indonesia Morowali Industrial Park, to produce nickel or cobalt chemicals as part of the EV battery production process. ■

Metair hails battery sales boost, looks for new chief financial head

Metair Investments has posted an overall 28% EBIT boost from its remaining battery businesses after selling off its troubled Mutlu Akü Turkish lead acid firm last year.

In full-year consolidated results for 2024, released on March 26, South Africa-based Metair said EBIT (earnings before interest and tax) for its energy storage division increased by a "pleasing" ZAR272 million ($15 million) compared to ZAR212 million in the previous year.

The company said the boost was helped by manufacturing efficiencies, scrap recovery and increased exports across the remaining units of its energy storage division — Romania-based Rombat and South Africa's First National Battery (FB).

FB saw an EBIT improvement of 25% to ZAR225 million, while sales of automotive batteries at Rombat jumped by 23% to 2.8 million units.

Rombat's performance was supported by gains in export sales that helped realise increased EBIT for the year of ZAR45 million (previously ZAR33 million). This was achieved despite competition from cheap imports and higher exposure to OEMs, Metair said.

The results are in line with a trading update released last month, when Metair said it wanted its primary focus to become automotive component manufacturing and aftermarket automotive parts and services.

The group said the sale of Mutlu Akü to lead mogul Howard Myers' Quexco Incorporated business, last September, has been a critical element of its turnaround. The Turkish business accounted for around 70% of Metair's total interest cost and 23% of net debt.

Meanwhile, Metair has started the recruitment process for a new CFO after the resignation of Anesh Jogia, with effect from April 1.

Jogia, who will serve his notice period up to June 30, 2025, is leaving to pursue new interests, Metair said. ■

BCI backs Trump partnerships and roadmap to power US innovation

Lead battery industry leaders in the US have backed calls by US president Donald Trump for a new partnership between the government, industry and academia to accelerate innovation.

Trump set out his vision in a 'roadmap' sent on March 26 to the director of the White House Office of Science and Technology Policy, Michael Kratsios. The president said scientific progress and technological innovation were the "twin engines that powered the American century".

Battery Council International, in an open letter to the president released on April 17, has reiterated its "long-standing commitment and support for such powerful partnerships".

BCI is also a non-partisan organization. It says it will work with whichever administration has been elected in the US as well as Congress, and with every administration to pursue its goal of supporting and growing battery manufacturing and recycling in the US.

BCI highlighted the "brutal reality" of unfair competition from countries such as China and said US legislation and regulation in the past few years had put the domestic battery industry at a disadvantage.

Meanwhile, rival nations have poured trillions of dollars into R&D "in a desperate bid to match the might of the US economy and our national excellence in battery technology and energy storage innovation".

The trade body praised the Trump administration's commitment to using the scientific prowess of the country's national laboratories to support increased investments in American innovation and economic growth.

"We agree with you that those investments will pay dividends for generations," BCI said.

With responsible and targeted use of research facilities at the labs — to support commercially focused energy storage R&D — US manufacturers will "always win in a fair fight on a level playing field".

"The American private sector can and does innovate independently. But the brutal reality is that many of our economic adversaries, most notably China, are not interested in a fair fight right now."

Batteries International reported earlier in April that the US was on course to include foreign battery material producers in a new round of tariffs — as Trump said he was determined to stop the country being exploited by overseas supply chain dominance. ■

European battery price-fixing probe decision to be 'due by the summer'

The findings of a probe into alleged price-fixing among major lead battery manufacturers are expected within a few weeks, according to the owner of one of the companies accused.

Batteries International revealed in December 2023 that EU competition chiefs had accused Clarios, Exide Technologies, Banner, Rombat, Fiamm Energy Technology and its predecessor Elettra of possible collusion to fix starter battery prices, aided by trade association EUROBAT.

Now Rombat owner, Metair Investments, has revealed in its annual results published on March 26 that "latest information is that a decision could be made just before the European summer".

Metair said due to the uncertainty in quantifying and determining the timing of any potential fine, the matter continues to be treated as a contingent liability at balance sheet date.

A European Commission spokesperson indicated to Batteries International on January 13 that there was "no legal deadline to complete antitrust inquiries into anticompetitive conduct". ■

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Battery firms are showing the world that when it comes to saving money and energy, it's not what you do, it's the way that you do it. Top industry figures share their insights, revealing why it's paramount to have a view that's wider than the bottom line...

Cutting to the chase

It's an exciting time for all of us as the global need for energy generation and storage grows. There's fresh investment, new technology and a commitment to constant improvement. But this also bring challenges, such as the uncertain economic and political climate.

Other factors need to be considered too - the health and safety of workers, the security of supply chains and accessing necessary materials - to give just a few examples.

Batteries International have delved deep into this imperative debate and spoken to key people in the industry on how they are making the most of opportunities to save money and energy in battery manufacturing in 2025. There are topics they agree on and ones where they differ - but all of them share the view that this is an inspiring time to be part of the race.

As Michael Maul, senior vice president of ISC and Technology, Daramic, says: "The energy infrastructure around the world is changing because of technologies like AI and Bitcoin. I heard at ELBC last year that if you ask AI one question, you're consuming a cell phone charge of energy. That means we need to be able to create, store and deliver as much energy as possible to satisfy the complexity of where we're taking technology. And we need to develop the technologies that satisfy that need. It's exciting, solving the question of how you make the most of every opportunity to enable and improve the delivery of energy."

Sorfin Yoshimura president, Scott Fink, says, "Saving money and energy requires a phased approach. First, battery makers need to take control of their processes and achieve more consistency and reliability in their production. This can save money reducing scrap at all process stages which wastes energy and money. Automation and data collection, aggregation and analysis will further support battery makers' ability to identify areas to focus on relative to reducing energy and therefore saving money in their manufacturing processes."

He adds: "Although the lead battery industry went decades without much innovation, the recent ten years or so has seen tremendous advancements, increasing and optimizing performance. This boost in innovation can be attributed to three main drivers: performance requirements from the applications demanding more power, challenges from competing device chemistries, and environmental health and safety concerns. Innovations in the manufacturing process are also quite exciting as mass production becomes more automated, with a huge focus on safety and environmental considerations. This is positively affecting the workplace for making and recycling batteries." ■

"To me, the number one knob that you can turn to affect energy costs is battery life. If you made a lead acid battery that lasted thirty vs three years, this increases the number of energy storage cycles for a given set of raw materials, enabling a lower cost of energy storage." — Michael Maul

Laying the groundwork

As the saying goes: 'Prior preparation prevents poor performance' And this is certainly true for manufacturing.

Having the right factory floor layout can make production more effective, but of course many plants were built years ago, and it would be costly to restructure them. As Brad Bisaillon, vice president of sales, Hammond Global, says, "I've walked through a lot of lead plants that weren't laid out very well and which could be a lot more energy-efficient if changes were made. But those changes will need upfront investment, which a company might not be ready for."

Michael Maul believes that making improvements at the design stage can save money for a number of reasons, one of them being that it helps ensure materials are used in a cost-effective way. He says, "Taking antimony, as an example, it's expensive and China is actively controlling the export of this material globally. If you can design a separator that helps the customer minimise the use of antimony or other materials, then that will help you make a lower cost plate that achieves a longer battery life."

Every battery manufacturer has changes and improvements they would implement if they had sufficient funds. And most of them believe that investment for the lead-acid battery industry is picking up.

Energy saving: Show us the money

You don't have to be a rocket scientist (or battery industry expert) to know that investment is the key to progress and saving money and energy, and that neglecting to do so has consequences. Richard Taylor, group managing director at TBS Engineering says he is surprised that during visits to factories around the world, he has seen lots of equipment still in use after 20 or 30 years. "Failing to invest in newer, faster equipment ultimately leads to one scenario" he warns. "In the last 20 years there has been a lot of consolidation in the industry. Going forward, only those that invest for the future will remain competitive, particularly as new chemistries evolve."

But he is also seeing a positive attitude towards investment.

"Three years ago, at my first battery conference, much of the discussion focused on the threat of lithium to the lead acid industry. The consensus was that the lead-acid battery industry was mature and that investment would decline. However, a slowdown in lithium uptake and ongoing demand for lead acid batteries has revived growth and investment in our sector. We're now seeing strong investment in equipment, particularly in areas such as AGM battery production, critical for start-stop technology in modern vehicles and energy storage solutions."

Hammond's Bisaillon believes there is still a 'ton' of innovation and investment happening.

"There were times when people were saying 'lead is dead', but that's not true at all," he says. "Take Clarios, one of the largest lead battery manufacturers globally. They have just announced a massive investment in optimising some of their processes and plants here in the United States, and also in Mexico and Brazil.

"In India, Tier 1 manufacturers are making major investments in production and plant improvements." He goes on to admit it can be 'difficult' for the smaller battery manufacturers in Tiers 2 and 3 who don't have deep pockets.

"They aren't in a position to throw $10 million dollars at upgrades when their annual revenue is less than that. It can mean that the tier 3 companies end up being bought out by ones in 1 and 2, but that's the same in any industry."

There is, however, pressure from alternate technologies, and Bisaillon believes this has pushed lead manufacturers to look internally at how to optimize. He says: "They're asking themselves questions like, 'How do I optimize the product, the processes, the raw materials selection and every other aspect of manufacturing?' That's really positive because it opens the opportunity to evaluate Hammond's paste additives that they may have historically not considered." ■

"Our passion at TBS is to develop and deliver new products, services and technologies that continue to reduce the costs of producing lead acid batteries on a large scale to ensure our partners don't just survive, they thrive."
— Richard Taylor

TBS prioritises investment

Over the last 18 months, TBS has significantly invested in innovation in both their traditional area of battery assembly and also in plate making, with the launch of their new ActivMat range of equipment.

"Increased output, improved accuracy and reduction in process variation are at the heart of every new design," says Taylor. "For example, the precision with which we now mould lead straps has been tightened to a tolerance 0.1mm compared with the industry standard of 0.5mm. This is giving our customers the opportunity to make significant lead savings as they no longer need to allow for strap variation in their designs. Typically, a 2mm strap width reduction on a standard automotive battery can save up to 48g of lead per battery. It may not sound huge but when it is multiplied by a couple of million batteries made on a TBS machine each year, it is significant."

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Energy saving: Living in a material world

Choice of materials influences all aspects of battery manufacturing and has a key impact on both the cost and energy-effectiveness of the process.

Brad Bisaillon says, "Choosing the correct materials can save money and energy. Unlike changes to factory processes or buying new equipment, it doesn't require massive investment, but it can make a significant impact.

"The right materials can increase charge acceptance and reduce formation time. It can also optimise the battery's performance and lifetime, creating a battery with higher value for the consumer whilst delivering meaningful reductions in battery formation and associated costs.

"It takes a lot of energy to form a battery and the process can take anywhere from twenty-four hours up to seventy-two or even eighty-four, depending on the size of the battery. So anything that reduces formation time is going to reduce energy and money in battery manufacturing."

Jimmy Stewart, VP of sales at MAC Engineering observes that: "With the lead rolling mills and punching technology available today, the grids of the batteries can be made thinner using less lead while allowing more active materials on the plate. This results in a cost reduction and performance improvement over the traditional grid casting."

As with other aspects of this global industry, the important issues of diversification and risk reduction must be factored in. If there's reliance on a particular material which can't be sourced, that can affect production at the plant and hence output and profit.

Lee Puckett, president and chief operating officer, Atomized Products Group, says: "A call to the industry to approve alternate sources of material is definitely something that's been a focus of mine. Often battery manufacturers will use the exact same component from the exact

"A call to the industry to approve alternate sources of material is definitely something that's been a focus of mine." — Lee Puckett

Chain reactions

Supply chain service companies can provide a massive advantage to manufacturers as they have logistics infrastructure and expertise helping to reduce costs, including specialists in shipping to ensure timely arrival of goods and the right carriers being used for specific routes.

Scott Fink is a fan: "There are many reasons why using a supply chain company can help battery manufacturers reduce costs. Procurement services available through a supply chain service expert can support battery makers to identify supply options available for their machines, materials or consumables and the specific value proposition for those goods. This can support battery makers by giving them supply chain safety in diversification of sources and also help target that the correct items are being used to address the specific need."

Supply chain service companies also have resources to help battery makers dial in on their consumption of goods and ensure optimised levels of inventory to minimize equipment downtime or costly air freight expenses that need to be tapped to bring material in a crisis.

Using local warehouse infrastructure available via supply chain companies can help reduce the cost of tying up money to manage long transits between the supply source and the consumption point for the goods.

same supplier for a long time. They'll mandate that it has to be this exact product from this exact location and manufacturer and we're not allowed to deviate from that.

"But I think if anything the last five years has taught us since COVID began, is that this fixed kind of reliance - this single source mentality - is no longer viable. From a risk perspective, if something happens, such as one country invading another and trade is limited, then you're suddenly scrambling to find an alternate source.

"Also, the alternate sources are often a lot more cost effective too. If I were allowed to use a different source for materials that both the customers and I have vetted, from a different region of the world, there are potentially significant cost savings."

He gives an example: "One critical component for our expander blends

"There are many reasons why using a supply chain company can help battery manufacturers reduce costs."

— Scott Fink

is sodium lignosulfonate, which is primarily sourced from Norway. They're a terrific supplier and extremely reliable. They continue to work not just with us, but also directly with the battery manufacturers to improve battery performance. But if some disaster were to befall Norway, all of a sudden the reliability of the source would be called into question. And the battery industry would be in a world of hurt if that were to happen.

"And it's not just for that component. There are so many components in a battery and it's tough, because a battery manufacturer has to source hundreds of different materials and they can't exactly devote their entire research and development team to finding multiple sources of every single product right now.

"But I do feel that it's important to find viable quality replacements from multiple locations. It's a huge risk reduction against something happening geopolitically, and I think reducing your risk does, by nature, reduce costs as well." ■

"Unlike changes to factory processes or buying new equipment, choosing the correct materials doesn't require massive investment, but it can make a significant impact." — Brad Bisaillon

Who said the 'T' word?

One huge headache affecting manufacturing in all industries on a global basis is that of tariffs. Scott Fink says:

"The protectionist trends in the geopolitical landscape seem to be here to stay for a while. But the tariff situation is quite fluid. Supply chain experts can help navigate these transitioning times to minimize any issues for the battery maker. Our mantra is that the only certainty now is 'uncertainty'. So, how to navigate this is simple. Remain flexible and have as many supply sources for goods as possible approved and ready to buy if certain supply lanes are disrupted by tariffs. In addition, putting capital to work and increasing inventory levels makes sense right now to stay ahead of the escalating prices that will be an obvious consequence."

Better together

Sometimes combining forces makes sense from a cost-effectiveness perspective. A strategic alliance between Atomized Products Group, Black Diamond and Addenda was a few years in the making but has benefitted everyone.

"The alliance allows us to use all three companies and our different technologies and different additive packages and then incorporate them into a cohesive unit that's tailored to what a particular battery line needs," explains Puckett. "It's a combination of our expanders, the Black Diamond molecular rebar product and positive plate additives such as tetrabasic lead sulfate from Addenda. We basically combine all three of those products into one overall additive solution to improve in many battery performance characteristics.

"We're aware that all our products are needed in the battery but none of us really have the technology, or the capability, to produce all those different materials at the same time, at the same level as the other ones. For example, Black Diamond have a good reach into the European market and good contacts and distribution lines. We have good distribution lines in East Asia and Korea and some of South America. And then Addenda has a facility in China and a really good hold on the e-bike market there. It's both a technical and a sales collaboration. We were saying, 'You have a strength here, I've got a strength here, so let's get together and collaborate.' We didn't do any kind of joint venture. There was no exchange of ownership or anything like that. Each company still currently maintains their own supply and distribution and sales lines.

"As the battery market continues to evolve, innovate and push for higher performance requirements on new vehicles whilst also improving environmental impact standards, I feel it's critical for increased collaboration among suppliers to the industry to ensure these challenges can be met."

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Battery manufacturing can be demanding work and employers have an obvious duty of care to provide. Setting up the necessary health provision and checks can be costly, and the more the process can be automated the safer it becomes and the less it costs...

To err is human but at what cost?

The cost effectiveness of automation has a global component, meaning that in areas where labor costs are higher, such as Europe and the USA, higher levels of automation bring down business outlay and increase profit.

MAC's Jimmy Stewart believes that with the technology we have available today that was not available 100 years or even 50 years ago, we are more able than ever to remove the worker from the hot, harsh lead environment.

"Automation and robotics can remove and palletize the plates, and other areas of battery assembly, such as group assembly, can be automized" he points out. "Further down the line in formation the batteries can be palletized, leads placed on and off terminals by robots and placed automatically into charging banks."

Richard Taylor, TBS, agrees: "Taking labor out of a process reduces cost, eases recruitment issues, eliminates exposure to lead and minimises manual handling," he says.

"Importantly, it also removes variation in build and product quality which in turn reduces downtime, scrap and ultimately cost. Optimising processes such as paste mixing, drying and curing also improves the consistency and ultimately the performance of the active material on the plates. This, in turn, allows the batteries to accept charge more efficiently, reducing formation times and energy costs significantly by as much as 20%. Reduced variation across all processes coupled with the latest automation technologies also drives greater output."

However, when it comes to automation, it's important to take a balanced approach.

"Automation is very dependent on return on investment for the work that needs to be done and the performance you're going to get out of it,' says Daramic's Michael Maul. "So, if you're not focused on the right balance of investment and labour costs, you can over-do as much as under-do." ■

Better for health

"The rules on blood lead requirements for employees in the US are becoming stricter," says Lee Puckett. "It's important to be aware of that and to bear in mind ways of making battery manufacturing environmentally friendly. One product that can help improving worker safety is the carbon nanotubes from Black Diamond Structures that we offer as part of the alliance. In addition to the performance characteristics these materials provide, they also improve the overall consistency and structure of the mix as it's being pasted onto the lead plates. This leads to a reduction in out-of-specification plates, which reduces cost and also means less material falling off the plates during the pasting process, resulting in an overall safer work environment."

Say hello to software

Sorfin Yoshimura's, Scott Fink, believes that having a software overarching throughout a battery-making facility can help the manufacturer in several cost saving ways.

"Software integration on a factory level will be more and more ubiquitous as automation increases in lead battery factories," he says. "It can help to optimize equipment functionality by helping monitor performance on a line-by-line basis. Software can also help to give battery makers data on utility consumption per machine or process. Once this is specifically identified they can then look for ways to conserve energy or promote better EH&S conditions in the plant."

In 2025 it's not possible to have a business discussion without looking at AI and how it's revolutionizing industries. But software improvements are also important.

The future of AI in the battery world

Generally, when it comes to using AI, the feedback is upbeat. Daramic, in particular, have already seen positive results.

"We've just started using AI within our work as a leadership team and we've already seen how it can increase the pace at which a business can work and accelerate the development of knowledge," says Michael Maul.

"For example, let's say you want to understand how metals interact within a battery, instead of having to search through books or the internet, you can use AI to distil that information down very quickly. You can say, 'I would like you to tell me about a material that interacts with a particular metal to suppress its interaction in a battery.' It will then do a search, read all the articles and distil that information. It refines your ability to gather information and know what direction you want to go in experiments. Or, to give another example, if you need to understand a theoretical model, you can say to AI, 'Can you provide me with a complete background summary of this model?' In the past you had to spend hours researching, but you can get that information extremely quickly now."

Scott Fink agrees that AI will have a role in certain processes such as the ability to sort through data, learn more quickly and support higher levels of automation.

"AI combined with vision systems are already widely available to support battery makers in removing labor doing visual checking on the line," he says. "AI helps to learn faster what is 'go or no go' on those production lines."

One place where using AI on the production lines has been a success is TBS Engineering. Richard Taylor says,

"We've already begun incorporating artificial intelligence into our processes, recognising significant potential in the latest AI learning-based camera systems. These can be trained to detect defects on the assembly line, improving quality control and reducing labour costs. We're also incorporating more and more smart sensors into our equipment to provide real time reliability and performance data for our customers to interrogate and monitor."

Jimmy Stewart gives a practical example of how he has seen AI vision systems being used.

"A final finishing conveyor load of mixed battery sizes for example, for a lawn mower, a large 8D truck and a bus can be picked from the conveyor line and put on a pallet like a Tetris game. That locks and balances the load on the pallet and results in less pallets for shipping the same weight to a customer who only orders mixed quantities."

Richard Taylor adds his penny worth: "Additionally, we're also developing augmented reality tools to support our global team of service technicians and our customers. For example, we will provide real-time remote assistance to help resolve line performance issues, saving both time and travel costs. Operators or our technicians will be able to collaborate with our UK-based team in real time, using smart glasses to view live annotations and technical drawings and receive guidance directly via Teams, all via the glasses whilst in front of the machine. We're also developing digital models of our machines that in the future will allow for virtual installation planning on the factory floor before finalising any designs." ■

And the winners are...

This year's winner of BCI's annual innovation award, the PNNL, was announced on the first day of the conference meetings on May 5. The US Pacific Northwest National Laboratory won by an overwhelming majority of the judging panel for its Grid Storage Launchpad.

The GSL is a new US national capability for speeding up energy storage research: it brings all phases of battery development and deployment cycle under one roof, ranging from fundamental materials and device prototyping through to 100kW-400kW scale testing and validation.

"This acceleration of the development process is already proving to be dramatic," said Vincent Sprenkle, director of GSL at the national laboratory.

"For instance, without the GSL it took about four years for us to take a flow battery concept through to something that could be approached commercially. Using the GSL we've seen a recent project make the same advances in just four months.

"This fast prototyping and comprehensive testing of the entire energy storage development cycle are features not found anywhere else within the US national laboratory system."

The GSL, $75 million facility was funded by the DOE's Office of Electricity which was an active force in its design and development.

"The GSL will prove an indispensable tool to encourage collaboration among researchers, across multi-disciplines and industry partners," said Sprenkle.

One of the most talked about features of recent BCI meetings has been the Sally Breidegam Miksiewicz Innovation Award. This was set up in 2016, as a tribute to East Penn's CEO following her untimely death in June 2014.

The award celebrates innovation in equipment, processes, services and products that advance the lead battery industry.

The range of innovations set up as candidates for the award has been startling. Some have been as simple as a better design shape for a marine battery; others have embraced the latest technological advances in our understanding of the lead battery.

Some of the nominations have been breakthroughs in the laboratory but struggled to be commercialized. And yet others — think of advances in EFBs — have been quickly embraced as a new standard in an emerging marketplace that continues to grow exponentially.

But, be they large or small, these innovations matter. All advances are worthy of note.

For the last decade a tonne of investment has been flung at developing better lithium batteries while lead research has been side-lined.

The revamp of the ALABC and its replacement by the Consortium for Battery Innovation is putting the lead battery back in the spotlight. Clear advances are on their way and credit must go to CBI for helping to put some of this together.

That said credit must also go to a generation of lead researchers that have remained in the background — think RSR, Hammond, East Penn, Daramic, ENTEK and many others — that continue to shape the lead battery industry.

This year 11 firms put their hat in the ring to win the award.

They were: Abertax, Ace Green, Autometer, Blewin, CAM, CMBlu, Daramic, Midtronics, Pacific Northwest National Laboratory, Power Solution and Stryten. ■

The Pacific Northwest National Laboratory achieved innovative fame and glory for leading the entire US energy storage industry into new fields of business and opportunity.

Make way for the Grid Storage Launchpad

The GSL is a new, US national capability for energy storage research located on the PNNL-Richland campus in Washington State. This $75 million research facility, funded by the DOE's Office of Electricity, is focused on developing battery storage technologies for the grid and transportation to provide resilient, reliable, and affordable electricity. As part of the grid-scale storage R&D, the GSL will advance battery research for electric vehicles, supporting DOE's mission of reduced carbon energy solutions.

The GSL brings all phases of the battery development and deployment cycle under one roof, ranging from fundamental materials and device prototyping to 100 kW-scale testing and validation.

This fully integrated facility encourages collaboration among researchers across disciplines and industry partners. Fast prototyping and comprehensive testing of the entire energy storage development cycle are features not found anywhere else within the US national laboratory system.

Research conducted in the GSL fills key gaps in energy storage development guided by four key missions — validation, accelerated deployment, collaborative working and education and training:

Dedicated in August 2024, the GSL is designed to accelerate the development, testing, and validation of new energy storage technologies, addressing critical challenges such as reliability, and sustainability. By fostering collaboration among researchers, industry, and policymakers, the GSL will advance solutions that strengthen grid resilience and enable greater adoption of electric vehicles. Its mission and capabilities position the GSL to drive significant progress in energy storage innovation, aligning with the goals of the BCI Innovation Award.

The GSL is focused on developing next-generation energy storage technologies that are safer, more cost-effective, and more durable. In addition to its focus on grid scale storage, the GSL also houses PNNL's vehicle battery research, providing expanding laboratory space and new capabilities to accelerate EV battery development.

The facility itself was designed with climate resilience in mind and was recognized by the DOE with the 2024 Outstanding Climate Resilience Project Award.

By providing industry partners with access to advanced testing and validation resources, the GSL reduces barriers to innovation and accelerates the development of reliable, cost-effective solutions.

PNNL completed first-of-its-kind district energy systems with the Energy Sciences Center, Heat Transfer Building, and GSL. These building projects achieved a major strategic milestone in elevating energy resilient operations.

When fully optimized, the Heat Transfer Building and Energy Sciences Center projects should save approximately 14 billion BTUs of energy per year and approximately 2 million pounds of CO_2 annually. The Grid Storage Launchpad building will further capture approximately 9.7 billion BTUs of energy per year and eliminate approximately 1.2 million pounds of CO_2 equivalent annually.

The GSL has stringently implemented national standards for fire, explosion, and electrical safety enabling safe and effective energy storage system testing and validation. The facility design features, particularly in deflagration prevention, demonstrate an industry-leading approach to managing the hazards associated with energy storage.

The GSL is designed to reduce the risk and speed up the development of new energy storage technologies with rigorous performance requirements throughout the development cycle. By offering shared resources, such as advanced diagnostic tools and modelling capabilities, the GSL eliminates the need for individual organizations to invest in expensive equipment and facilities. Its unique pouch and prismatic cell lines allow industry partners to validate new technologies

Additionally, its focus on validating technologies under realistic conditions helps identify and address potential issues early, saving costs associated with later-stage failures or inefficiencies. These efforts accelerate the development timeline and lower overall expenses, making energy storage technologies more affordable and accessible.

By providing industry partners with access to advanced testing and validation resources, the GSL reduces barriers to innovation and accelerates the development of reliable, cost-effective solutions.

By conducting independent testing and validation, the facility ensures that the technologies meet their intended key objectives, goals, and benefits.

Through its suite of advanced instruments, including the PFIB and Ultra Spectrum STEM, the GSL offers precise materials analysis, scalable prototyping, and comprehensive testing. It is the only DOE facility to house a prismatic line, which will help scale new technologies by giving industry a meaningful way to see how new materials work in industry relevant formats.

GSL serves as a home for standardized training and development of the next-generation workforce, from skilled labour to first responders and safety officials, to utility planners and regulators. ■

Verifying the state of a battery can be a demanding task when monitoring has to be undertaken outside the confines of a laboratory.

Battery monitoring in a tough environment

Most measuring instruments designed for battery monitoring are optimized for laboratory testing, which limits their practical application in real-world settings. This limitation is problematic in demanding environments where traction batteries, such as those used in forklift trucks and cleaning machines, must be monitored continuously during operation.

Abertax has developed a battery monitoring tool that is versatile enough to be installed on various battery technologies, including lead-acid, lithium, and sodium batteries.

This is fully encapsulated within a sealed housing that meets the IP68 standard, ensuring it can withstand virtually any battery environment, including exposure to dust and water.

One of the standout features of this monitoring tool is its higher sampling rates compared to conventional battery monitoring devices. It captures all relevant battery parameters — such as voltage, temperature, and electrolyte levels — and stores them in the device's flash storage, which has several gigabytes of capacity.

This extensive storage allows for comprehensive data logging over extended periods.

The tool can connect to a user's internal LAN network or be accessed via an access point, providing added flexibility for remote data access.

This capability ensures that users can monitor battery performance in real time from virtually anywhere, facilitating proactive maintenance and management of battery systems.

Continuous monitoring with high sampling rates ensures timely alerts for conditions that could lead to battery failure. This reduces the risk of unexpected downtime and associated costs, ensuring smooth and efficient operations. The tool's high-frequency data collection also facilitates the creation of detailed performance reports. Users can visualize this data through graphs and charts, making it easier to interpret trends and make strategic decisions for effective battery management.

The graph below provides valuable insights into battery performance during charge and discharge cycles. The key observations include:

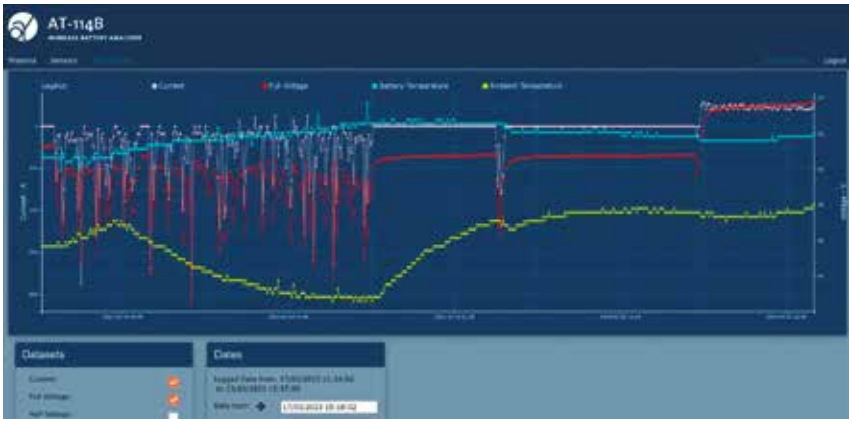
Peak currents — The graphs reveal the peak currents during charging and discharging phases, which is crucial for assessing the battery's capability to meet high-power demands, such as those required for electric vehicle acceleration.

The time interval during which the current remains at or near its peak value is indicated on the graph. This duration is vital for determining whether the battery can support short bursts of high power without overheating or degrading.

Regenerative processes — During regenerative processes, such as braking in electric vehicles, the graph shows a spike in current in the opposite direction (charging). The peak current during this phase indicates the amount of energy that can be recovered and fed back into the battery system, which is essential for evaluating the efficiency of energy recovery systems.

Voltage insights — The highest point on the voltage curve during charging reflects how close the battery approaches its fully charged state. This value is critical for ensuring safe operational limits. The speed at which the battery's voltage recovers after high-current discharge or regenerative events can be observed on the voltage curve.

A quick return to stability indicates good responsiveness for applications requiring rapid cycling between charge and discharge states. The lowest point on the voltage curve during high load periods reveals how low the voltage drops under stress. Monitoring this parameter is essential to prevent over-discharge, which could damage the battery. ■



In a practical application involving a cleaning machine, high-speed sampling from the Abertax tool revealed that a significant amount of current was being drawn from the battery at specific moments. Further investigation indicated that these high current events coincided with cleaning operations on a particular type of floor. The long-term data sampling provided technicians with a comprehensive view of the issue, ultimately leading to the discovery that an incorrect type of motor brush was being used for that specific floor type. This insight allowed for corrective actions that improved the machine's efficiency and extended the lifespan of its components.

Ace Green Recycling began developing its lead battery recycling process more than a decade ago. It has now moved into processing lithium batteries.

From feedstock to black mass to lithium carbonate

Ace Green Recycling's lead battery recycling has been deployed commercially under licence for two years its own flagship facility in Texas, is expected to begin production next year.

From the philosophy and principles of this lead technology, Ace has also developed its 'LithiumFirst' strategy for recycling lithium iron-phosphate batteries (LFP). In this process, lithium, the most valuable component of what is set to be the dominant future lithium-ion chemistry, is extracted first to maximize yield and purity.

The key features of Ace's proprietary lithium process are identical to its lead recycling technology:

- Modular and scalable
- Low-temperature hydrometallurgical process
- Environmentally friendly chemicals used
- Permitting friendly

Ace Green's LFP recycling facility

Ace has run its owned-and-operated integrated LFP recycling plant in India since 2023: It is run on a 24/7 production basis with black mass being produced from LFP feed stock and later lithium carbonate, iron phosphate and graphite are extracted from black mass.

Ace Green says lithium is extracted as lithium carbonate in a proprietary process with a purity exceeding 99%. Ace uses a non-leaching process that removes the lithium without disturbing the olivine structure of the iron phosphate, allowing it to be upcycled back into battery production rather than being sold for lower value applications such as to the fertilizer industry.

After lithium extraction, iron phosphate and graphite are separated. Although the graphite product can be sold as a reducing agent in smelting, more value comes from returning it to the battery supply chain. Ace is conducting research to upcycle this graphite to battery grade in collaboration with the National Renewable Energy Laboratory (NREL) to retain and regenerate the graphite morphology so it can be reused directly for batteries.

As with Ace's lead technology, its lithium-ion process was developed to provide a profitable solution that addresses key issues to maintain battery recycling's long-term sustainability

Commercial strategy

As with Ace's lead technology, its lithium-ion process was developed to provide a profitable solution that addresses key issues to maintain battery recycling's long-term sustainability. For lithium scrap, this process includes the challenges of transboundary transportation, supply chain constraints and recovering lithium economically.

This modular technology supports phased, low cost and localised deployment in key markets, while ensuring a de-risked approach to account for the current LFP feedstock limitations. As feedstock availability improves, the straightforward construction of the Ace modules allows rapid deployment as capacity demands grow.

LFP batteries provide a price advantage against other Li-ion batteries by using less lithium and cheaper iron phosphate. But this also means that LFP has a significantly lower extractable economic value from scrap

The challenge of LFP recycling

LFP batteries are assuming a major role in electrification with increasing use as the battery of choice for lower-cost EVs. These batteries use less lithium than other Li-ion chemistries which, together with the low-cost iron phosphate component, provide a price advantage against other Li-ion batteries. But this composition also means that LFP has a significantly lower extractable economic value from scrap.

This recent surge in LFP usage has resulted in large volumes of cathode production scrap, quality rejects and EOL EV and ESS batteries not currently being recycled due to these poor economics. However, there remain ethical, moral and regulatory imperatives demanding the recycling of LFP.

The coming EU Battery Regulations will require that all batteries sold in the EU must achieve quite ambitious targets for recycling rates and for recycled content, including lithium.

Without significant levels of LFP recycling, where will the recycled content come from, as demanded by legislation?

"Effective, efficient and economical LFP recycling can now be achieved through the use of the Ace process," say the firm.

"Our own facility has been successfully operating since 2023, producing saleable products with a positive P&L. This groundbreaking technology has enabled the essential need to recycle lithium iron phosphate batteries to become a practical reality with commercial success." ■

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Cost saving has always been a core sales point of battery machine manufacturers, so how about producing lead oxide without the huge expense of melting the lead? Ingenious.

The Lead Shaver XL

With this system, lead oxide can be produced without a melting pot, cylinder caster, exhaust chimneys, or gas burners. This allows battery manufacturers great savings in kWh spent to maintain melting pot temperatures even when idle.

"Our Lead Shaver XL is the first system produced especially for producers that work with lead hogs instead of pigs," says Francesco Marfisi, electrical designer and B2B sales manager at CAM, the Italian battery machine manufacturer. "It only requires an electrical connection, water for cleaning the cutting tools (closed circuit), and air for moving the pistons. Lead shavings are thus cold-cut from ingots or hogs to a size that makes them similar in every way to casted lead cylinders: H 25 mm Ø (25-30) mm, weight (80-110)g.

"Our cold-cutting system avoids the mechanical stress caused by the compression system (cubing) used in other cold technologies."

The Lead Shaver XL, comprising the use of lead shavings as feed material for ball mills, is a milling machine specifically designed to cold-cut shavings from 2000lb lead hogs, and is based on the same functioning principal as the classic lead shaver for 45kg ingots, which was patented in 2005.

The Lead Shaver XL has been installed in an important American battery manufacturing facility, says CAM.

This machine produces lead shavings or gratings directly from the lead hog, thus eliminating the need to melt lead, with great advantages, such as:

- Immediate full production rating
- The lead foundry department is eliminated, with subsequent savings on energy costs for melting and holding molten lead during off-production hours.
- Lead pumps and transfer pipes have been eliminated.
- Savings on maintenance costs for maintenance of melt pots, burners, refracting material.
- Dross produced by traditional melting process is eliminated, thus offering great advantages on special waste management.
- Lead ingots/hogs no longer require special storage for protection from humidity.
- Safe working environment due to elimination of molten lead exhaust, exposure to dross, and no risk of burns.

The milling action of the cutting tool favours hardening of the surface of the shaving, which facilitates the abrasion process inside the mill. Moreover, with the same action, the shaving is exposed to a compression and traction tension, which stresses and coarsens the shaving's surface. In a short time, the surface begins to flake off inside the mill.

The specific shape of the lead shaving favours air flow all around and through it, thus providing a greater surface area to be oxidized, as compared to traditional lead slugs.

It is well known that temperatures during the production phase affect the crystal structure of PbO, which is very important for the pasting, curing and formation phases. The shavings allow an increased passage of air throughout the interstitial areas of the ballast, with respect to casted slugs producing a low temperature oxide which is essentially free of PbO crystals. ■

The shavings allow an increased passage of air throughout the interstitial areas of the ballast, producing a low temperature oxide that is essentially free of PbO crystals

Mechanical description

The lead shaver XL is made up of a sturdy, electro-welded carbon steel structure with a feeder on which the lead ingots are moved by means of a hydraulic piston and exchange pack containing 65 litres of hydraulic oil. The system is equipped with valves, manometers and a hydraulic pump complete with a 3kW motor.

The mechanical movement of the utensils occurs by means of a parallel axis gearbox complete with a 36kW chain transmission motor and bumper couplings. The machine is equipped with n.1 complete set of n. 42 cutting tools.

The set has been tested to last approximately 180 working days, with tools requiring a check-up every six months. Depending on the status, each individual tool can be replaced or cleaned. This operation requires about three hours of work by two maintenance technicians: the rectification or replacement work can be done on site, with the machine turned off.

Long duration energy storage is now the holy grail of the battery industry. Flow batteries appear to immediately offer a way ahead — and organic ones an affordable and environmentally sensitive alternative.

Combining LDES with high energy density

CMBlu Energy, a founding member of the Flow Battery Industry Group (FBIG), is commercializing its Organic SolidFlow battery for stationary energy storage.

"It offers advantages over existing solutions in terms of performance, sustainability, and cost while meeting the growing demand for medium and long-duration energy storage. The Organic SolidFlow battery is a unique technology to provide safe, sustainable, and secure stationary energy storage, local backup power, and renewable energy support," says a CMBlu official.

"We've taken inspiration from nature's unmatched energy density and naturally occurring energy storage to develop a groundbreaking solution: a system that uses stationary, solid organic materials to store energy. Using carbon-based molecules with earth-abundant and easily sourced materials, CMBlu Energy combines the best of solid-state batteries with the architecture of flow batteries."

The firm says that as a result it has brought a first-of-a-kind long duration energy storage system to the industry with its Organic SolidFlow battery. This technology has an energy density of up to 200Wh/kg which is up to 10 times greater than traditional flow battery systems.

This is heading in the direction of the energy density capabilities of conventional lithium-ion batteries with increased energy storage duration but without the safety issues.

There is no risk of fire or explosion and is free from toxic fumes so this eliminates the safety concerns often associated with lithium-ion batteries. Moreover, unlike lithium ion batteries which can be a headache to dispose of it has recyclable and reusable organic electrolytes that have little environmental impact.

Its 20-year lifespan, unaffected by usage cycles, surpasses lithium-ion systems, which degrade with each cycle use and require replacement after seven to 10 years.

Its modular design allows for efficient stacking on industrial racks inside buildings without the need for expensive temperature controls.

By relying on abundant, non-metal energy storage materials, CMBlu Energy's system supports a localized supply chain, reducing dependence on imports and ensuring energy security. "To further this mission, we are in the planning stages of building US- based manufacturing facilities to help strengthen domestic energy production," says CMBlu.

"Building on these advantages in performance and sustainability, the Organic SolidFlow system also offers cost benefits. CMBlu battery solution is competitive with lithium-ion at the four to five-hour duration and is increasingly becoming more cost-effective as the energy storage duration increases.

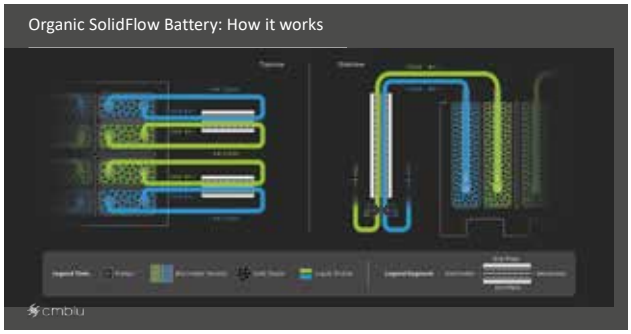
"Ultimately, our goal is to surpass the US Department of Energy's recommended cost targets and achieve one cent per kWh by 2035. Our technology has been demonstrated at various scales across diverse geographies and climates in Europe and the US."

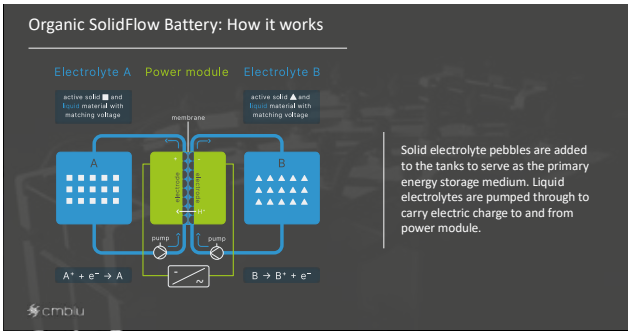
In the US, demonstrations began in December of 2023 with its 1MWh battery energy storage pilot with WEC Energy Group in Wisconsin, targeting five to 10 hour discharge durations, with phased testing ongoing.

Its 50MWh Desert Blume project with utility partner Salt River Project (SRP) in Arizona was CMBlu Energy's first utility-scale pilot, set to be the largest non-lithium, organic long-duration energy storage installation in the US in 2026.

The firm has also secured two DOE-awarded projects involving Idaho National Laboratory (INL) and Argonne National Lab (ANL) to enhance EV charging and microgrids in Illinois and Idaho. Internationally, it has deployed a variety of demonstrations beginning in 2023 and sold its first commercial system, an 11MWh battery, to Mercedes-Benz. ■

Ultimately, our goal is to surpass the US Department of Energy's recommended cost targets and achieve one cent per kWh by 2035





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Better separators improve lead battery charge acceptance and cycle life in low over-charge, deep-cycling conditions.

Next generation separators — now

Reliable energy storage is vital for off-road motive power applications such as golf carts and general utility vehicles, where harsh operating conditions and unpredictable cycling patterns can negatively impact battery performance.

As the deep cycle market shifts towards lower overcharge, faster recharge, and more opportunity charging requirements, major innovations in critical battery components — such as separators — are needed to improve the cycle life performance and long-term significance of lead batteries in this space.

The Daramic technical team, working with industry committees and global battery manufacturers, says it has met the challenge with the development and launch of a new series of heavy-duty deep cycle separators: Daramic® HD Blue™ and Daramic® HD Gold™.

"Built upon proven Daramic HD® and Daramic HD Plus® separator technology that provides antimony suppression and increased cycle life, these new separators have been designed to reduce separator electrical resistance and optimize lead-acid battery performance in low overcharge, fast recharge and opportunity charging conditions," says the firm.

"Repeated BCIS-06 life cycle testing using golf cart batteries at various levels of overcharge demonstrated

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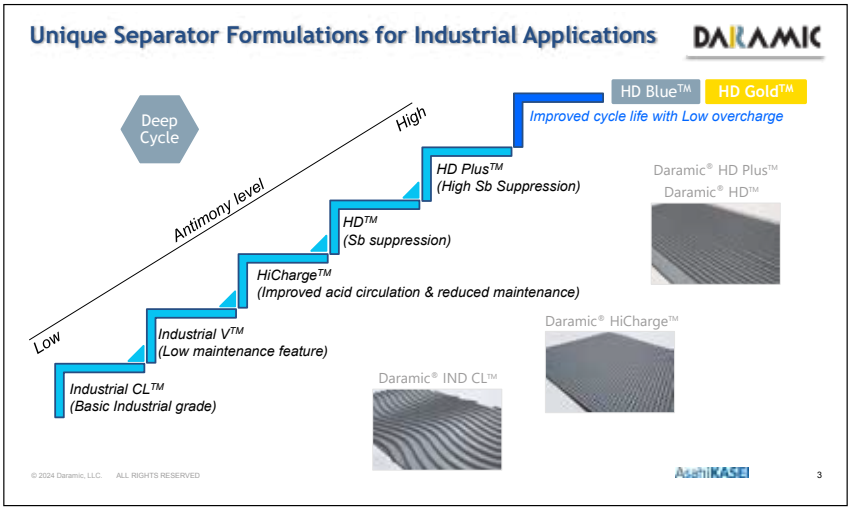

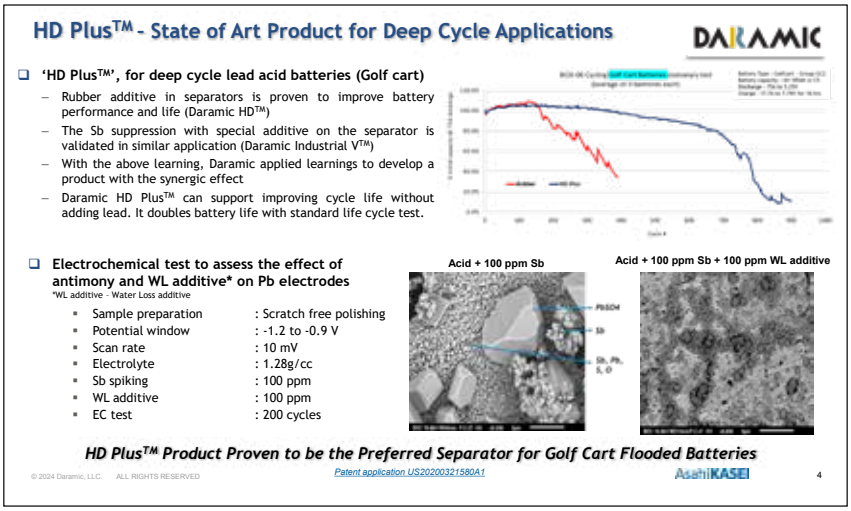

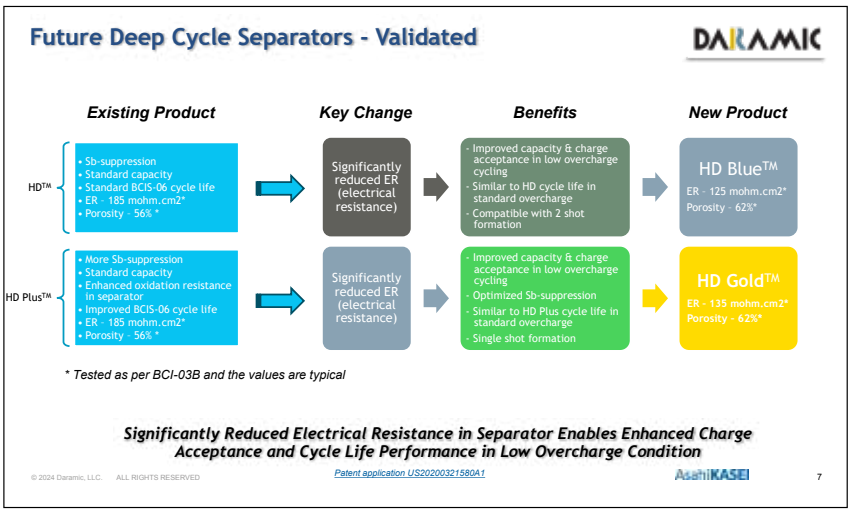

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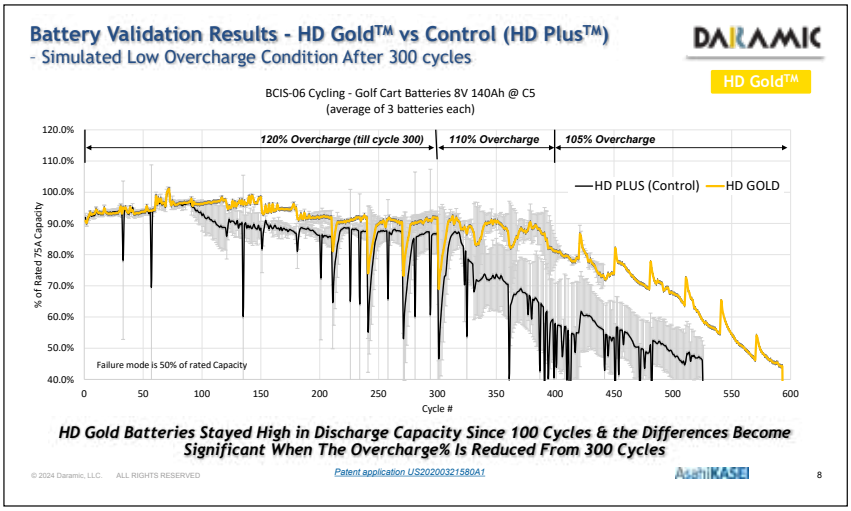
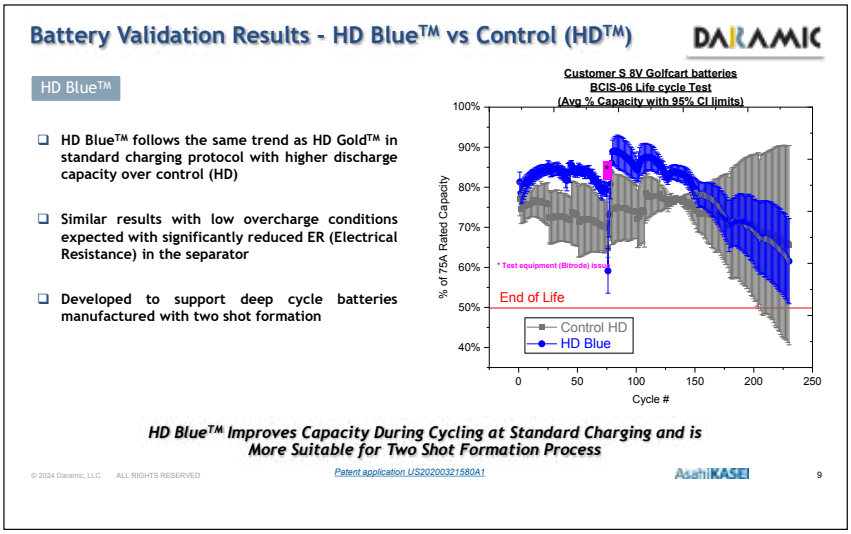
significantly improved capacity and charge acceptance, good antimony suppression and enhanced cycle life performance in low overcharge and partial state of charge (PSoC) conditions when compared to current separator alternatives.

"Daramic® HD Blue™ separators are best matched for two-shot battery formation techniques while Daramic® HD Gold™ separators are well matched for one-shot battery formation. By developing a range of products, Daramic is bringing this innovative solution to market for a wide range of lead-acid battery manufacturers, enabling the industry to meet an emerging and critical deep cycle market need." ■



"Repeated BCIS-06 life cycle testing using golf cart batteries at various levels of overcharge demonstrated significantly improved capacity and charge acceptance, good antimony suppression and enhanced cycle life performance in low overcharge and partial state of charge (PSoC) conditions when compared to current separator alternatives"



THE DARAMIC HD PRODUCT LINE: IN BRIEF

The new Daramic HD product line caters to the emerging market need of low overcharge conditions in deep cycle applications – Compared to rubber separators and the previous PE versions (HD & HD Plus), HD Gold and HD Blue products with following features designed for upcoming market need of low overcharge condition:

- Significantly reduced electrical resistance
- Increased porosity

The HD Gold product improves battery cycle life with low overcharge conditions and achieves improved life over Daramic's HD Plus product with standard charging

The HD Blue product is suitable for batteries manufactured with two shot formation and delivers higher discharge capacity during cycling with cycle life similar to Daramic HD.

Product attributes (BCIS-03B standard)	Rubber	HD & HD Plus	HD Gold & HD Blue
Backweb	380 micron	300 micron	300 micron
Porosity	40%	56%	62%
Electrical resistance	300 mohm.cm^2	185 mohm.cm^2	130 mohm.cm^2

Three companies with three different products are also offering their product innovations to be scrutinized by the BCI judges.

AutoMeter

AutoMeter Products, is a high technology company based in Sycamore, Illinois USA. It's BCI innovation nomination is its XTC-360 which it describes as a next generation benchtop battery load tester and charger. It says its features are:

- Proven automatic load-based testing
- Proprietary algorithms that replicate the cranking conditions of the vehicle
- Extremely energy efficient with switching power supply technology
- Produces battery state of health test result within 15 minutes regardless of Initial Battery State of charge
- Quick recovery charging on deeply discharged Batteries
- Battery load test results in as quick as 15 seconds
- Enhanced safety with temperature monitoring during charge activity and optimized the charge process By dynamically changing the charge parameters
- Intuitive user Interface engineered for all skill levels
- Compatible with 6, 8, 12 volt flooded, AGM, EFB, deep cycle & $LiFePO_4$ batteries
- Equipped with patented digital pulse load technology
- Wi-Fi enabled and compatible with AMPNET, Auto Meter's cloud-based data management system. ■

Midtronics

Midtronics, is a high technology diagnostic and testing firm headquartered in Willowbrook, Illinois. The firm was founded in 1984, and then acquired a battery testing technology from Motorola that allows a technician to diagnose the condition of a lead acid battery by measuring its electrical conductance.

Its BCI innovation nomination is its xLVS-9000 which it describes as a battery diagnostic system that is based on its SafetyPower software

Electric vehicles rely on 12V batteries to power critical low-voltage systems, not for cranking engines. Thus, traditional 12V testing methods are inapplicable for EVs, as they don't diagnose the battery for its application.

"SafetyPower is the only solution designed specifically for precise, capacity-based 12V diagnostics in EVs, ensuring system performance and driver safety," the firm says.

This software leverages data collected from millions of battery tests for quick, accurate diagnostics: It says key benefits are:

- It is the only technology designed for accurate EV 12V testing
- Customizable pass/fail thresholds for specific needs
- Reduces warranty errors
- Improves technician compliance and customer satisfaction
- Full diagnostic support for ICE 12V batteries. ■

Blewin Inside

"Blewin Inside", BESS systems are based on the use of Blewin batteries which will go into series production in 2025. The Blewin battery system is based on:

- Low internal resistance, resulting in fast and high current charging and significantly reduces temperature dependence. This is partly because it is not damaged by deep-freezing.
- Pure lead grids, which increase the cycle life and simplify efficient recycling
- Grid layout and geometry that allows energy density above 100Wh/kg
- These technical differences result in specific economic indicators, which are highly favourable both in terms of initial investment value and in terms of expenditure per cycle or per unit of energy
- Nearly unlimited recyclability, significantly outperforming all existing solutions.

"With the creation of "Blewin Inside", all the technical solutions we have developed so far and their results are concentrated here in the grids and, by implication, in the technical features (concave pentagonal cross-section grid fibres, 3D fractal geometric grid silhouette)," says Tamás Mészáros, a Hungarian academic who has developed the system,

Other notable benefits of the system include:

- It can also handle the energy production of low-power wind generators, better than any BESS solution currently available.
- It is not sensitive to deep discharge, so its operating range is significantly wider than any battery system currently in use.
- No internal heat generation or acid vapour emission is detected during operation of Blewin batteries, making them extremely safe.

Technical parameters of the Blewin Inside BESS unit

- Power 4.5 kW/unit
- Lifetime 6-8 years
- Warranty 5 years
- Outputs 24V, 48V DC, 230V AC (European standard)
- The base units can be scaled up to around a 4MW container

"Following a successful market launch, we are also aiming to further expand the applicability of Blewin lead batteries, as this specific performance may be of interest to additional users. We expect that manufacturers of 48V MHEV cars will recognise the benefits of their application," says Mészáros.

"We also assume that the time will come for hybrid BESS solutions, in which the irreplaceable technical properties of lead acid batteries — well handling the high current — and the favourable parameters of other battery systems can be combined to serve user needs. ■

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Making a battery without pasting and curing seems an impossible task but the makers of this novel battery say this is achievable.

Bagplate electrodes for a lead acid battery

This astonishing product — better known as the Bagplate Battery — was patented first in India in 2019 by Chittaranjan Ghosh and subsequently patented in the US (patent no 11,145,855 in October 2021) creates lead acid battery electrodes which are bagged in terelyne cloth bag without having used any pasting to avoid paste mixer , pasting machine and oven.

By increasing the active material ratio to structural material a higher energy density is achieved. Moreover, the use of the bag system for both negative and positive plates protects them from shredding of active materials while the battery is in use with a lesser chance of failure.

Some immediate advantages of the process mean that a paste mixture is not required, nor is a pasting machine, a spine casting machine or a vibration filling machine. Likewise a curing chamber is not needed.

The inventors point out that elimination of the pasting process — merely the addition of the lead oxide and a 24-hour wait — means that making "batteries is so easy and reliable that unskilled employees can make them".

The patent says

"A pair of bag-plate electrodes comprising, Pb-Ca structure grid and dry active lead oxide powder, the Pb--CA grid and dry active lead oxide power are added into and bagged in a terelyene cloth bag, sealed by low density polythene glue.

"The active powder for the positive plate is Pb3O4+PbO+Pb. The active powder for the negative plate is PbO+Pb."

Jayanta Ghosh who submitted the nomination, says "bag electrode batteries can give five years of service without a top up. This means bag electrode batteries can replace VRLA ones with twice the active life. Moreover, no temperature restriction is required for installation.

"Bag electrode batteries can be designed for very slow charging mode to enhance battery life and for medium charging mode for frequent power cuts.

"Bag electrode batteries can be designed for very quick charging in CC-CV [constant current-constant voltage] mode for solar and BESS systems. Only three to five hours of sunlight is sufficient for them to be fully charge (115% of discharge AH) without raising the electrolyte of the battery. Bag electrode technology breaks the charging time barrier of lead acid battery in CC CV mode."

This all means that bag batteries can challenge lithium batteries regarding charging time.

In the supporting documentation for the application, a host of Indian testing certification was demonstrated. ■

"Bag electrode batteries can be designed for very quick charging in CC-CV [constant current-constant voltage] mode for solar and BESS systems.

It's about time that the lead battery industry rose up to seize the huge opportunities possible for sales in the rapidly expanding BESS sector.

Drawing up a new set of battlelines

1922 was a defining moment for the car industry. Henry Ford, the automotive pioneer, joked customers could have "any color they wanted, as long as it's black."

The reasoning was simple, "Black was the cheapest color and using a single color meant the assembly line didn't have to be shut down for a change of paint color."

Strange to say this was intellectual laziness in dealing with the problem early on and within a couple of years, car colors were coming out in a variety of hues.

Fast forward a century the prevailing wisdom with battery energy storage systems is this: customers can have any BESS they want — as long as its lithium. At last companies such as Stryten Energy are coming forward challenging the present situation,

Many of the problems associated with lithium BESS are well known — their flammability, the cost of the $300 million fire at Moss Landing, California in January proved that point but their lack of recyclability is also proving a worry over the technology's future.

Stryten sought to find large-scale storage needs of a demanding US grid infrastructure with a lead battery that specifically dealt with the dangers of lithium fires — which can be explosive, rapidly spread, produce noxious fumes as an environmental hazard and cause widespread destruction due to the high temperatures lithium cells burn out.

Stryten Energy says its Lead BESS is UL 1973 and UL 1741 certified, and UL 9540 is in process. The system complies with IEEE 1635, IEEE 1547, CSA 22.2#017 and NFPA 70.

In addition, every module has a BMS sensor to measure the voltage, temperature and current to control the charging and discharging, and sends the data for monitoring of the cells. The system is connected to Stryten Energy inCOMMAND Monitor to ensure uninterrupted operation and provide preventive maintenance schedules.

"The Stryten Energy Lead BESS can be implemented at military bases, hospitals and in commercial and industrial applications, such as data centers, manufacturing plants and warehouses, to ensure continuous operation of critical infrastructure and applications when traditional power sources fail," says the firm.

"Our Lead BESS technology is scalable to meet capacity demands, and the overall cost is on par with lithium energy storage systems,"

The technology has already been deployed across two sites in the US

Stryten Energy's Lead BESS is a key component for the first community resilience hub in the southeast. Vicars Community Center in Atlanta, Georgia, is powered by a 34.1 kW DC solar installation connected to 320 kWh of battery storage, which will provide off-grid power for up to three days.

This facility is a centralized, trusted organization where community members can access reliable power for their essential devices, continue to receive information as emergency situations develop, store medications sensitive to temperature, and safely gather in the aftermath of an emergency or severe weather event to allow the community to recover safely and effectively.

A Stryten Energy Lead BESS has also been installed at the Georgia Institute of Technology's Carbon Neutral Energy Solutions Laboratory.

CNES is designed to foster industry collaboration and support translational and pre-commercial research in clean, low carbon energy technologies. ■

SUSTAINABILITY MAINTAINED

Lead battery technology already has an established domestic supply chain and a complete circular economy, providing a sustainable and cost-effective energy storage solution for businesses requiring energy resiliency for their operations.

Each lead battery produced in Stryten Energy's manufacturing plants is made with 90% recycled material.

For every battery produced, Stryten recycles the equivalent of that battery through its North American-based recycling partners.

"Our Lead BESS is ideally suited for densely populated environments or in buildings where its safety profile against thermal runaway is critical"

And the winners are...

East Penn Manufacturing has won the 2025 BCI Amplify Award in its category for Industry Leadership while Stryten Energy took the crown for the category of Product Marketing.

Admiration was given to East Penn for its innovative video campaign in its "Mission Possible" video campaign. This highlighted the latest developments in domestic lithium and lead battery manufacturing and the company's support for first responders and the military.

East Penn's Joel Brady, credited by his boss Chris Pruitt as being the mastermind behind the firm's 'Mission Possible' campaign said the idea came to him while attending last year's Battery Show.

"We realised that people were getting lost in the lithium debate little realising the possibilities of using lead batteries," he said.

Joel started writing the script behind the campaign with a traditional marketing approach but quickly found it unworkable. "I wondered about doing a humorous take on the Mission Impossible movies and then it all seemed to come together."

Meanwhile, Stryten Energy took the crown for Product Marketing for its innovative video campaign promoting Enhanced Flooded Batteries, featuring the Not-So-Grim Reaper.

"We're proud to accept the BCI Amplify Award for Product Marketing for our Grim Reaper Enhanced Flooded Battery campaign," said Melissa Floyd, Stryten Energy's vice president of communications and marketing. "Our Grim Reaper campaign proves that humor is alive and well in B2B advertising."

The BCI audience reaction, when shown the Grim Reaper, was positive with laughter and clapping — a clear indication that Stryten's campaign was on the button and the message was on target.

"As the definitive spokesperson for battery life and death, Grim is the perfect choice to deliver the performance and longevity benefits of our Enhanced Flooded Batteries. This award celebrates our team's commitment to pushing the boundaries."

A panel of judges reviewed Amplify Award product marketing entries and ranked them on four criteria: innovation, uniqueness, clarity, and design aesthetic.

What the award recognises

BCI three years ago set up the Amplify Award. This looks to highlight campaigns by its members which have the most positive impact in advancing the lead battery industry, and which incorporates innovation and design to achieve outstanding results.

The award recognizes a highly effective and top-rated internal or external campaign, program or communication that serves to inform, educate and promote lead battery products, components, services or the industry as a whole on the basis of four key pillars: innovation, sustainability, essentiality and safety.

Campaigns can include elements from all forms of marketing, branding, public relations, corporate social responsibility and education programs, including digital or print collateral, training programs, consumer marketing, awareness campaigns, commercials, websites, social media, point-of-sale materials, tradeshow booths and more.

The goal of the award is to recognize strategic communications designed to address a need and provide a platform to showcase innovative ideas that support the lead battery industry, particularly campaigns that highlight the key pillars of lead batteries: innovation, sustainability, essentiality and safety.

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East Penn's Mission Possible campaign brought awareness to three of BCI's core values: essentiality, innovation, and sustainability.

The power of edu-tainment

The "Mission Possible" campaign was designed to illustrate in an engaging and entertaining way how the battery industry has the necessary power solutions to meet the never-ending demand of energy that the world so desperately craves.

The campaign's purpose, run by East Penn's Navitas arm was to show how battery manufacturers are relied on to meet the world's increasing energy needs — for a customer as vital as military and our domestic consumer battery needs in general.

Specifically, the plot in the "Mission Possible" video focused on the military's essential needs of powering portable equipment, sonar systems, and vehicles. The plot also touched on the importance of meeting energy needs on a much larger scale, describing it as a "matter of national security."

Meeting current energy needs isn't the only battle; the industry must also be equipped to meet evolving needs by innovating new technologies. That's why part of the plot involved confirming that one has the capability to advance battery technology. "Mission Possible" addresses this need by mentioning Navitas's in-house capabilities and the importance of the advancement in lead technology such as bipolar and auxiliary power battery solutions.

The final dimension to satisfy the government involved confirming sustainable practices.

These practices are meant to show the lead battery industry as an example of what can be offered to other battery technologies as they work to create an infrastructure as well established and robust as lead-based battery technology.

"Many campaigns rely on opening a firehouse of information that never really connects with the audience and best communicates the need. We wanted to do something much more dynamic and impactful. Hence, we used the power of story and created an eight-minute movie that was sure to capture attention. People's attention spans are limited to 10 to 15 seconds at the least when information is dispersed in traditional communication," said East Penn.

Through the media of story and opening a "story loop," the audience will be much more enticed to assimilate the information. People's attention otherwise is limited

Through the media of story and opening a "story loop," the audience will be much more enticed to assimilate the information as it is necessary to follow along with the story that's captured their attention.

"With hired professional actors, set pieces designed by a production company, and on-site footage, we knew we had the perfect combination to create a singular vehicle of 'edu-tainment', said East Penn.

The point of the "Mission Possible" movie was to educate the audience on how much the world relies on our industry's products to meet its ever-growing energy needs. Visuals were used to accompany the dialogue and make it easy to follow some real-world examples.

To produce this movie, East Penn used a combination of set-design pieces and on-site footage.

The video was shown in its booth at The Battery Show in Detroit, Michigan on a 114" x 65" video wall display. The show's attendance was about 19,000 so it gained visibility with OEMs and leads in advanced battery technology.

"We also did a geo-targeted LinkedIn post to promote the showing of the video at the booth. This gave us 15,714 impressions." the company said.

Another important part of this communication was to help reinforce to the employees who work for the company that their role to the nation is extremely critical. East Penn posted this video on its company app named Gateway and got 1101 views.

"The video was also shown by Navitas Systems during a week that celebrated our appreciation for their employees. This was shown to the entire workforce and very well-received and motivational. We also have plans to use it as a tool for onboarding new employees and making a good first-impression." ■

Enhanced flooded batteries are largely unknown to a North American audience. Communicating their importance to consumers is important as Stryten's Grim Reaper campaign showed.

Ask not for whom the bell tolls...

Enhanced Flooded Batteries are increasingly becoming the battery of choice for car manufacturers due to their long cycle life and superior performance in high heat conditions under the hood of the car.

While EFBs share more than 50% of the European market for advanced batteries with AGM technology, the US market is largely unfamiliar with EFBs despite nearly 30% of the new start-stop and hybrid vehicles sold in the US coming equipped with an EFB.

The Grim Reaper campaign kicked off in May 2024 and featured three videos: Parking Deck, Morning Rush and Breakfast with Grim. Customers and prospects saw display/banner ads on Automotive Aftermarket-focused websites and newsletters.

So enter Stryten Energy's Grim Reaper, who shares the advantages of EFBs for supporting start-stop and hybrids, powering multiple devices/electrical demands and superior performance in high-heat environments.

The Grim Reaper is the world's foremost authority on life... and death. "Grim," as he is affectionately known, is busy these days collecting dead batteries while spreading the virtues of longer life with Stryten's EFB.

Breaking through the clutter of typical automotive aftermarket advertising, these humorous videos engage and entertain audiences while driving home the relevance of EFB.

As part of the campaign's tactics:

- Created a landing page specific to the EFB campaign
- Produced video series to promote EFB for the automotive aftermarket
- Placed digital ads with multiple aftermarket publications between May and November 2024, in advance of AAPEX 2024
- Ran geotargeting campaign during AAPEX 2024
- Shared videos on social media to increase reach
- Promoted videos in the July issue of the Stryten Energy Insider customer newsletter.

The videos were also shared on YouTube and LinkedIn. The audience was directed to our EFB landing page, which provided additional information about the benefits of enhanced flooded batteries.

As power demands continue to rise, reliable energy storage systems are vital. A domestic energy storage supply chain is vital to ensure the energy resiliency and energy security of the US, especially as ever-changing geopolitical tensions and long supply chains threaten overseas sources.

Stryten is unique among battery manufacturers in that we are not betting on any one battery solution. We believe the future will involve a variety of technologies, depending on customer needs, and will include advanced lead, lithium and vanadium flow battery solutions

The campaign results were highly positive. In terms of paid media, total impressions were 693,074 with an average open rate of 34.85% and average click rate of 0.17%.

In terms of results for YouTube videos the objective was a click-through rate of 2%. The Grim Reaper: Parking Deck Encounter attracted 795 views with a click-through rate of 4.8% and an average view duration of 0.44 (73.8%).

The Grim Reaper: Morning Rush attracted 607 views with a click-through rate of 4.8% and an average view duration of 0.44 (73.7%).

The Grim Reaper: Break with Grip attracted 373 views with a click-through rate of 10.9% and an average view duration of 0.35 (82.4%). ■

Stryten is unique among battery manufacturers in that we are not betting on any one battery solution. We believe the future will involve a variety of technologies

The Battery Service Skill Challenge, hosted by Club Assist, successfully reached a broad and diverse audience, maximizing its impact across the automotive industry and beyond.

Communicating the message of excellence

The Battery Service Skills Challenge (BSSC) Championship, held on October. 1, 2024, at Topgolf, Lake Mary, Florida, assembled the top 19 mobile battery service technicians from the American Automobile Association (AAA) and Canadian Automobile Association (CAA). After a three-month qualifying period, technicians who demonstrated exceptional performance advanced to regional competitions.

The final 19 competitors earned their spots in the championship by winning at the regional level, emerging as the top performers from over 15 events held across the US and Canada.

The BSSC Championship awarded winners across four categories, with a total prize pool of $30,000, with the top technician winning a grand prize of $15,000.

Competitors demonstrated their expertise in critical areas, including automotive battery knowledge, safety protocols, and sustainability practices.

One of the competition's focal points was customer interaction, where technicians were judged on their ability to communicate the essentiality of battery safety, maintenance, and full system testing. Competitors demonstrated how to explain why battery replacement was necessary, going beyond a simple jump-start to emphasize the importance of a full assessment.

Club Assist endorses the MBC-1000 tester, developed by DHC in partnership to address the unique challenges faced by AAA and CAA mobile battery service technicians at the roadside.

The competition emphasized key safety practices, such as maintaining a safe distance from the customer, using the correct safety equipment, and following proper protocols when handling Keep Alive Memory (KAM) units and other critical tools.

Originally, the BSSC was born out of a need to address a common challenge among mobile battery service technicians: a lack of diagnostic testing at the roadside.

The communication strategy for the Battery Service Skills Challenge was designed to be clear, comprehensive, and engaging, to ensure all participants and partners were well-informed throughout the entire process.

To simplify the technically complex aspects of the competition, Club Assist implemented a multi-step communication plan that started with a preview of the event. This initial phase included an overview of the scorecard and a dynamic sizzle video, which effectively captured the essence of the competition and set expectations for both participants and customers.

The design of the Battery Service Skills Challenge was strategically crafted to position Club Assist as the host of the event. By prominently showcasing both the Club Assist logo and the Battery Service Skills Challenge logo, the campaign effectively reinforced the company's leadership role.

In addition to the direct reach of AAA and CAA members, Club Assist secured local organic advertising within each competitor's footprint, further amplifying the event's visibility within regional communities

The event's expanded reach was strengthened by the involvement of additional key sponsors, including industry leaders like Clarios, DHC, and East Penn Manufacturing.

Through a combination of targeted outreach to AAA and CAA members, local advertising efforts, and robust sponsorship support, Club Assist's campaign successfully reached its target audience, driving engagement and creating a highly visible, impactful event that resonated with both the automotive industry and the public.

With its blend of impactful design, clear messaging, and strong organizational leadership, the Battery Service Skills Challenge has set a new standard for industry events and has positioned Club Assist as a potential top contender for this prestigious marketing award. ■

The Battery Service Skills Challenge, hosted by Club Assist, represents a unique and impactful event in the automotive industry. It sets a new standard for technical excellence, customer engagement, and industry collaboration.

The dedication event and digital media campaign for the Grid Storage Launchpad for Pacific Northwest National Laboratory amplified the visibility of the launch of a new US national capability and a $75 million facility for energy storage research.

Launchpad to the future

PNNL's launch campaign for the Grid Storage Launchpad emphasized the immediate dury of this facility: to validate, accelerate, and educate on research that advances battery research and essential collaboration for grid infrastructure as well as electric vehicles. This supports DOE's mission of helping meet the nation's emerging energy needs, making energy more accessible, and strengthening US competitiveness in the global energy market.

Raising awareness of DOE's investment in grid sustainability, the communications campaign showcased the facility's ability with first-of-its-kind safety systems and test environments to validate new grid storage technologies, from basic materials and components to prototypes.

As GSL was designed with climate resilience in mind, subsequent to the launch, PNNL was recognized by DOE with the 2024 Outstanding Climate Resilience Project Award, acknowledging PNNL's commitment to sustainability and operational efficiency, supporting a resilient, reliable, and affordable energy future.

The launch also highlighted the building project achieving a major strategic milestone in elevating energy resilient operations: the building will capture approximately 9.7 billion BTUs of energy per year and eliminate approximately 1.2 million pounds of CO_2 equivalent annually.

This multichannel communications campaign intentionally employed a combination of audience interaction through an online countdown clock with a rocket preparing for takeoff, social posts, promotional videos of the facility, testimonial videos from stakeholders, flyers, fact sheets, site tours, event engagement activities, media interviews in English and Spanish, and livestreamed coverage of the dedication.

Highlighting a visual reference to a rocket liftoff from a launchpad, this event communications campaign for the GSL dedication featured branded 'launch' iconography and messaging for the new capability associated with battery and grid storage research.

The objectives of the campaign facilitated multiple viewpoints and touchpoints to invite and involve participants while conveying GSL's mission in grid-scale storage R&D to support resilient, reliable, affordable, and secure electricity. On the day of the event, guests joined in activities celebrating the festive GSL launch atmosphere — guided tours, a ribbon cutting ceremony, a branded photo booth backdrop, branded refreshments, and commemorative desktop mementos including GSL-branded rockets and batteries.

Promotional materials featured a direct visual association of battery and grid storage research to the facility while illustrating key aspects of its intended service to fill gaps in energy storage development by four key missions: validate, accelerate, collaborate, and Educate.

The dedication event presented an opportunity to feature GSL's ability to steward innovation and collaboration, speeding up the cycle of development to deployment toward a more resilient grid. To help stakeholders visualize the immediate trajectory for the Grid Storage Launchpad, a rocket liftoff was central to campaign imagery.

The GSL campaign garnered attention from many prominent outlets including strong platforms that receive an estimated 709,098,090 unique visitors monthly. Earned media coverage included key placements in GeekWire, North American Clean Energy, Utility Drive, Yahoo News, and Energy Storage News as well as bilingual television news (English and Spanish).

Social media: On LinkedIn, dedication event posts drew 95,866 impressions, 1,503 reactions, and notable shares from high-profile organizations. On Instagram, posts on the dedication and spokespeople garnered 12,381 impressions, 618 reactions, and the highest overall performance in PNNL's history on that social platform. ■

Highlighting a visual reference to a rocket liftoff from a launchpad, this event communications campaign for the GSL dedication featured branded "launch" iconography and messaging for the new capability associated with battery and grid storage research.

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Power to the Extreme and Lithium OnePack were two campaigns that took strong products from the manufacturers and presented them to the public in an engaging way.

The joys of pure lead — and lithium too

The "Power, to the Extreme" campaign shines a spotlight on the TEL-HT battery, a next-generation solution engineered for unmatched performance in extreme temperatures, from -40°F to +160°F (-40°C to +71°C). This campaign underscores TEL-HT's innovative use of patented Pure Lead (MSE) technology and advanced grid alloys, which extend its lifespan and reduce costs by transitioning from a iver-year to a six-year replacement cycle.

Pure Lead technology uses ultra-high purity and tightly controlled active materials made from pure, virgin lead. High-purity grids improve the battery's resistance to corrosion by eliminating grain boundaries within the grid where corrosion can form.

A proprietary Ball Mill oxide made with ultra-high purity positive and negative active materials and specialized processing techniques creates a better-balanced cell. Similar to a flooded cell, this cell operates with a reduced float current. This slows grid corrosion and limits water loss typically associated with traditional VRLA batteries.

The campaign's concept of "Power, to the Extreme" stands out by directly tying the product's exceptional durability and efficiency to its storytelling.

Rather than relying on standard promotional tactics, the campaign leans into the idea of "extreme" by vividly illustrating the battery's ability to endure harsh conditions.

An interactive demo invites customers to virtually explore the product's capabilities, offering an experiential element that sets this campaign apart from traditional marketing strategies in the industry.

Additionally, C&D leveraged data available through the digital campaign elements to optimize the campaign. Analyzing the data allowed C&D to implement creative targeting tools to improve reach to core audiences.

Technical concepts are often difficult to translate for broader audiences, but this campaign simplifies them with a sharp focus on benefits and outcomes. Through clear visuals, concise messaging, and a user-friendly demo, the TEL-HT campaign bridges the gap between technical specifications and customer needs. This approach makes the product's unique features, such as high-temperature resilience, extended lifespan, and cost savings, accessible to both technical and non-technical audiences, ensuring the message resonates widely.

The campaign's visuals capture attention immediately, using vibrant, high-contrast designs to highlight the extreme conditions TEL-HT is built for. Cool tones included icy blues and fiery reds to clearly depict the temperature spectrum, while clean, modern layouts and bold typography emphasized key features and benefits.

From trade show booths to digital ads, the design maintained consistency and professionalism, reinforcing the product's advanced nature. Additionally, the campaign adapted its imagery and messaging to reflect extreme indoor environments based on customer feedback, further demonstrating its relevance and adaptability.

The TEL-HT campaign achieved remarkable results in its first year, showcasing its impact and effectiveness:

- Generated 161 qualified leads from a highly targeted audience.
- Attracted over 260,353 landing page views and 324,202 ad clicks, reflecting strong engagement.
- Garnered 26,600 social media impressions through thoughtful, platform-specific outreach.
- Secured 559 press mentions, further extending the campaign's visibility and credibility. ■

THE TROJAN LITHIUM ONEPACK CAMPAIGN

This effectively introduced this groundbreaking 48V lithium-ion battery pack to the market. It highlighted its advanced technology and practical applications for low-speed electric vehicles through integrated dynamic digital marketing tools, a video series, social media, public relations, traditional advertising, strategic partnerships, and compelling visual graphics for trade shows.

Key features, such as extended run times, fast charging, and maintenance-free operation, were showcased through a multi-channel strategy that maintained brand messages and visuals to create consistency that improved retention.

Digital marketing elements aligned with the battery pack's digital innovations. Tools like the Trojan SmartBattery App for real-time monitoring were complemented by the campaign that underscored the product's cutting-edge technology. Additionally, the campaign spotlighted the exceptional performance of OnePack by documenting and promoting a first-ever, record-setting golf cart climb to the summit of Pikes Peak.

Clear messaging and visuals focused on the benefits of the technical elements, emphasizing the pay-off rather than design. Examples include "60 miles on a single charge," "2.5-hour recharge time," and "10+ year lifespan" — all conveyed into digestible, relatable points.

The campaign achieved remarkable success, reaching and engaging its target audience:

- Audience reach: over 5 million impressions across digital platforms
- Public relations: more than 1,100 editorial placements of OnePack-related news in 2024.
- Reach: 91,455
- Engagements: 3,724
- Dealer locator clicks (landing page only): 2,146
- MNTN streaming commercial:
- Households reached: 232,401
- Verified visits: 1,823
- Notable streaming services: NBC, Paramount+, Samsung TV+, AMC, CBS News

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Mongolia's road

An ultra-modern lead battery recycling facility has been built in Ulaanbaatar, Mongolia's capital city. *Batteries International's* Mainbayar Badarch interviewed Odonsuren Ulziibat, the driving force behind the creation and financing of the plant.

Pollution is a killer. No question about it. And in the rapidly expanding economy that is Mongolia, some 3,000 people die annually due to pollution of various types, but mostly air toxicity. Around 350 of these deaths are due to lead poisoning, according to NGO Pure Earth.

The reason behind the lead pollution is the country's rapid growth — there was an 7% increase in GDP for 2023 and 5% last year — which has meant a huge surge in affluence and also car imports over the past few years. With the cars come lead acid batteries and 7,500-8,000 tonnes of them are discarded annually.

In 2019, the General Directorate of Professional Supervision inspected plants that recycle lead batteries and found that lead levels in the vicinity of the factories were between five and 100 times higher than the permissible level, lead sulfate levels were 100-466 times higher, and arsenic levels were 3.8-7.2 times higher.

Despite this, private companies still recycle batteries in the most basic way possible — old batteries are cut open by hand, the plastic is discarded and the acid thrown away. Only the metal is left and this is melted over open fires and then is ready to be exported to China.

One Mongolian businessman — Odonsuren Ulziibat, now executive director of Electrochem Mongolia — decided this type of recycling needed to be changed.

Odonsuren has an interesting background. As a young man in 1992 he lived in Romania to learn the language and studied at the Bucharest University of Economic Studies, majoring in international economics in 1998.

The plan was eventually for him to become a diplomat and to work at Mongolia's Ministry of Foreign Affairs.

In the event, after graduation he entered the world of banking and went on to become a vice president at the country's Trade and Development Bank and Capitron Bank. En route he also obtained a master's degree in international banking and economics at the University of Birmingham in the UK with intermediary spells in the Netherlands, Singapore, and Japan.

After 17 years in banking he decided to establish a private business with friends and set up Electrochem in 2018 initially looking at battery refurbishment and then at battery recycling.

Around the time Odonsuren contacted International Lead Association in London and was put in touch with Brian Wilson, at that time, the ILA's roving fixer.

Odonsuren's first task was to develop and formalize a national standard for the country. For this he needed expert

Electrochem Mongolia: putting the initial financing together

Electrochem Mongolia is a 100% domestically invested enterprise. Electrochem was able to raise funding by approaching friends, business partners, and financial institutions. The firm successfully launched a Green Bond Debt Instrument through the Mongolian non-stock market, based on the approval granted by the Mongolian Securities Dealers Association in January 2024.

Within the framework of this debt instrument, the company raised MNT1.3 billion ($371,000) for financing working capital at an annual interest rate of 18% over four years. The debt instrument is convertible into the company's shares at the end of the term.

Invescor Recycle acted as the investor of the debt instrument issued by Electrochem, and this private investment fund is the first impact investment fund in Mongolia, jointly established by Rio Tinto Mongolia and Invescor Financial Group. Also, they received long-term green loan from the Golomt bank and work at 60:40 (liability/equity) ratio.

For the revenue stream, the company has exported 400 tonnes of lead to China as of the start of April. South Korea is considered as another potential export market.

To increase the supply of used batteries, it has been necessary to educate citizens and businesses about the importance of recycling and how harmful lead-acid battery waste is to the environment. This has included not just explaining the why's of recycling but how to avoid mistakes when collecting it. Considering this, the company imported leak-proof and acid-resistant boxes from China and placed them at autocar repair chains under contract.

Mongolia itself is a huge country — the 17th largest in the world. So one challenge Electrochem faces is the collection of batteries from towns located as far away, as 1,700km from the plant.

Odonsuren says: "Just because we have built our factory doesn't mean that pollution has been eliminated. But if all the batteries coming out of Mongolia come to our factory, we can eliminate lead pollution to some extent."

He plans to create an integrated battery collection network in Mongolia. The above standard does not only mention recycling standards. There are words such as collection, storage, transportation, and recycling. Now, only the recycling part has been done. The collection, storage, and transportation process is the next step. Odonsuren discusses potential ways/solutions with national fuel supply companies.

to a clean earth

After 17 years in banking Odonsuren decided to establish a private business with friends and set up Electrochem in 2018 initially looking at battery refurbishment and then at battery recycling

advice to get government approval which he obtained from professor Tsevegjav of the Mongolian Science and Technology University and the ILA.

Meanwhile, he visited similar plants in South Korea, Japan, and India. To get the business project off the ground in terms of the physical infrastructure, Odonsuren contacted Mark Stevenson, an internationally respected expert and metallurgist and founder of Global Lead Technologies.

The advice from Stevenson was key to learning the technological know-how, appropriate equipment, and proper operational management methods.

As a result, Electrochem decided to source plant machineries and equipment from Jaipur-based Gravita India. But he also imported and installed key equipment from the West. Some motors, filters, and fire gun were purchased from Italy. Compressors and laboratory equipment (Spectromax) were sourced from Germany. Other supplementary in-plant vehicle and labor clothes were imported from China.

Design of the plant took a year to achieve and involved consultation of four parties: Global Lead Technologies, Gravita, Electrochem and a local design firm. Plant construction including machinery assembly and installation took almost two years. Several Indian experts of Gravita worked onsite during the machinery assembly process.

Subsequently, the plant was opened on March 26, 2024, and qualified with the ILA's benchmark assessment tools.

The plant has a capacity to recycle 700,000 batteries or 12,000 tonnes of lead-acid batteries per year. This is enough to recycle all of Mongolia's current annual end-of-life batteries and fully meet its growth needs for the next 10 years.

Customization of the plant was important in the design process. Mongolia has a harsh continental climate. So, factors such as condensation had to be considered. An air pollution control system was need to be installed inside the plant (in warmer countries these are installed outside).

The plant is one of the most modern plants operating in the world today, with many advantages, including no technological waste, the purification of used water and its reuse in operations, and the consumption of approximately 30% less heat and electricity compared to other similar plants. Electrochem introduced two-step hygiene systems and operates with two special licences from the Ministry of Heavy Industry and the Ministry of Environment.

Electrochem's plant generated 40 new jobs. At present, it also employs 12 Indian nationals.

The plant produces three types of products from batteries: 99.97% pure lead, gypsum, and polypropylene plastics. Gypsum is extracted from the sulfuric acid. This prevents 1,400 tonnes of sulfuric acid being dumped into the environment and produces about 280 tonnes of gypsum.

In the future, the plant will add a production line to produce plastic products such as reinforcement insulation and pods. ■

And nickel hybrids from EVs too ...

After lead-acid batteries, nickel-metal hydride batteries have become the second source of battery pollution in Mongolia. The country imports 60,000 hybrid vehicles from Japan annually. Japanese director of Toyota Sales Mongolia said: "The safe disposal and disposal of used batteries is well regulated in Japan. However, once they are exported overseas, they become out of our control. This is one of the issues we need to address."

After commissioning the plant, a South Korean firm approached Electrochem to explore cooperation opportunities to conduct research on nickel-metal hybrid batteries recycling. As a result, they have commissioned KPMG for the feasibility study and await the result.

Li-Cycle secures bankruptcy protection in Canada

Troubled Toronto-based lithium battery recycling firm Li-Cycle said on May 14 it had filed for and received bankruptcy protection in Canada as it starts a formal sale of its business or assets.

The firm's US units also launched proceedings in the US Bankruptcy Court for the Southern District of New York.

Li-Cycle's announcement came just a few weeks after *Batteries International* reported a further bleak financial outlook for the firm — which warned it might be unable to continue as a going concern.

In full year results posted on March 31, the company said despite reduced losses, it requires additional financing to meet its obligations and repay its liabilities arising from the ordinary course of business operations when they become due — "if it is to continue as a going concern".

The firm said it is "presently aware" of no additional sources of financing to meet its obligations and repay its liabilities arising from the ordinary course of business.

And it revealed a potential lifeline deal with mining giant Glencore is still under evaluation.

A special committee set up by the recycler continues to study the terms of the proposed deal, but Li-Cycle said it can provide no assurance that it will enter into an agreement attractive to its shareholders and other stakeholders.

Li-Cycle said adjusted EBITDA loss in the past year improved to US$90.5 million, compared to an adjusted EBITDA loss of US$156.4 million in 2023.

This was largely driven by higher revenue, lower cost of sales and selling, general and administrative expenses.

As of December 31, 2024, Li-Cycle had cash and cash equivalents on hand of US$22.6 million.

Ajay Kochhar, Li-Cycle's president and CEO, said there had been progress in 2024, including closing a US$475 million loan facility with the US Department of Energy to help finance the firm's Rochester Hub project.

"Looking ahead, we are focused on managing our cash position while considering our financial and strategic alternatives."

Li-Cycle announced a leadership shake-up last March and job cuts representing 17% of the firm's workforce to generate about US$10 million in cost savings on an annualized basis.

Li-Cycle confirmed last August that its first battery recycling 'spoke' facility could be shut down, as the firm explored "financing and strategic options" to increase near-term liquidity.

In addition to the latest filing, Li-Cycle confirmed it had entered into a $10.5 million debtor-in-possession financing and a 'stalking horse' credit bid for at least $40 million with mining giant Glencore, its largest secured creditor. That arrangement is subject to court approval.

Li-Cycle said previously it had been working to cut costs and seek financing and "strategic alternatives" to fund its business.

However, the board said the firm's special committee of independent directors had since determined that it was in the best interests of the company to launch proceedings under Canada's Companies' Creditors Arrangement Act (CCAA).

The company's board of directors and management will remain responsible for the day-to-day operations of Li-Cycle under the general oversight of monitors during the CCAA proceedings. ■

Ecobat to ramp up recycling at US, European plants

Ecobat has announced that three lithium ion recycling plants commissioned over the past year have become operational — with a combined processing capacity of up to 10,000 tonnes.

The lead and lithium recycler said on April 2 it is already working on plans to ramp up recycling capacity across the plants in the UK, Germany and the US to a combined total of around 25,000 tonnes.

All three facilities focus on the production of black mass, the critical material derived from recycled lithium ion batteries, supporting the development of sustainable battery supply chains, according to Ecobat.

Germany's Hettstedt plant, commissioned in the fourth quarter of 2023, works with major automotive OEMs and collection programs across Europe.

The Casa Grande, Arizona plant, commissioned last April, works directly with automotive OEMs, battery manufacturers and e-waste recyclers.

The third plant, commissioned in Darlaston last November, is a hub for the UK and wider European market.

"Ecobat's rapid expansion in lithium-ion battery recycling demonstrates our commitment to meeting the growing demand for sustainable, closed-loop production processes," said Brett Horton, managing director of Ecobat Solutions.

"With EV sales rising and more end-of-life batteries entering the market, our new facilities are well-positioned to meet these challenges."

Ecobat released its second annual sustainability report at the end of last June.

The firm pointed to various areas of business that had improved, including a new process for increasing capacity in its smelters and the reduction of blood lead levels for its staff.

Ecobat said its plant in Bazoches-les-Gallerandes, France, had discovered that by isolating gypsum waste from lead paste during the process of electrolyte neutralization with lime, it could increase the capacity of smelters by 5%.■

Horton: "Ecobat's rapid expansion in lithium-ion battery recycling demonstrates our commitment to meeting the growing demand for sustainable, closed-loop production processes"

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Nafees Batteries opens lead recycling plant in Qatar

Nafees Batteries' new lead battery recycling plant in Qatar has been formally opened by the JMJ Group.

JMJ said the plant, opened on February 27, will process ULAB into high-purity lead alloys as part of plans to boost sustainability across the state.

The company did not release details about the recycling capacity or technology deployed at the plant, but said the facility aims to lower hazardous waste, reduce reliance on imports, and promote energy-efficient industrial practices.

Chairman and MD sheikh Jabor Bin Mansour Bin Jabor Bin Jassim Al Thani, who founded JMJ in 2009 and led the opening ceremony, said: "Nafees Batteries reflects our commitment to sustainable industrial development, turning waste into valuable resources and reinforcing Qatar's leadership in responsible manufacturing."

The opening follows JMJ's launch of the QD Recycling Factory for ferrous and non-ferrous scrap metals in Qatar in November 2023. ■

Nigeria call for investments in squeeze on informal lead recycling

Nigeria's government is calling for domestic and international players to support a ramping up of regulated lead battery recycling in the country.

Environment minister Malam Balarabe Lawal said at the International Conference on Upgrading the Lead-Acid Battery Recycling Sector in Abuja on March 18 that the government was committed to cracking down on informal recycling.

Lawal said it was already taking steps to stop unregulated recyclers from prioritizing profit over environmental and health safety.

Speaking on the conference sidelines to the Project for Responsible Battery and Metal Recycling, Lawal said increased investment in the African nation would be key.

"We will take all necessary steps to enforce best practices in the battery sector. This includes supporting recycling facilities that adhere to regulations and holding non-compliant ones accountable," he said.

The two-day conference was organized by the National Environmental Standards and Regulations Enforcement Agency and federal environment ministry in collaboration with Sustainable Research and Action for Environmental Development — on behalf of Germany's non-profit Oeko-Istitut.

The German government has said organizations including the German Agency for International Cooperation (GIZ) will continue to support projects that encourage responsible lead battery recycling.

The Oeko-Institut said last year that it had launched a new program aimed at improving battery recycling in Nigeria in cooperation with international partners including the lead battery industry.

Oeko-Institut researcher on circular economy and recycling Frederick Adjei told Batteries International in March 2024 that members of the international 'LeadBattery360°' initiative had been contacted for their expertise.

Last September, Batteries International reported that UK-based Hinckley Recycling was involved in developing a lead and lithium ion battery recycling plant in Nigeria.

British high commissioner to Nigeria, Richard Montgomery, confirmed on September 18 that the equivalent of $5 million was being made available to support initial investment in the project for Ogun state. ■

Ace Green lead and lithium licensing arrangement for Armenia, Georgia

Ace Green Recycling has agreed a lead and lithium tech licensing deal for battery recycling in Armenia and Georgia.

Ace said on February 19 it had signed two agreements to license its technology and supply battery recycling equipment to Armenian non-ferrous scrap recycler Mel Metal.

Ace expects to license its proprietary 'GreenLead' technology, in addition to selling and licensing its lithium battery equipment services for Mel Metal operations.

Ace said Armenia is a gateway to critical European markets and a location that can serve as a springboard for the company to deploy its services and develop commercial partnerships regionally and further afield.

As part of the lead battery recycling aspect of the deal, Ace will license its technology over a 15-year period. Mel Metal will buy equipment from Ace to process up to 6,000 tonnes of lead batteries annually, with the option to acquire more recycling capacity.

In addition, Ace will generate revenue by selling and supplying proprietary chemicals for operations as well as allowing Mel Metal to use the GreenLead brand — with operations expected to start in the third quarter of this year.

Ace will sell and license its lithium battery breaking and shredding equipment and battery discharging system to Mel Metal — with Li recycling also expected to start in the third quarter of this year.

Armen Hayrapetyan, chairman of Mel Metal parent company the Edmet group, said the firm wanted to develop a more circular battery material ecosystem in the southern Caucasus.

Ace claims its technology replaces the smelting furnace, operates at room temperature, runs on electricity and has zero Scope 1 greenhouse gas emissions (direct GHG emissions such as those made while running boilers and vehicles) and reduces solid waste by more than 85%.

Nishchay Chadha, CEO and co-founder of Ace, said without its technology and equipment in Armenia, scrap battery material would likely be exported or undergo a pollutive pyrometallurgical material recovery process. ■

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Scanning Acoustic Microscopy can non-destructively detect minute physical Li-ion battery flaws, with up to 100% inspection of all manufactured units.

SAM to detect Li battery flaws

Lithium-ion, battery manufacturers must detect various physical flaws during production to ensure safe, reliable performance. Failure to detect even minute defects can lead to internal short circuits, overheating, fire, explosion, diminished function, costly product recalls, and serious reputation damage.

Li-ion batteries produce gas under stress and a process called gas evolution can lead to swelling and structural changes over time that reduce safety, efficiency, and capacity. Batteries encased in pouch cells, specifically, are more susceptible to swelling and structural issues than rigid cells. The stress from swelling and gas evolution can cause layers within the battery to separate or disbond.

Today, the use of advanced scanning acoustic microscopy — SAM — is an important technique to detect flaws in the manufacture of Li-ion batteries.

SAM can image the material forms and internal structures of all batteries to identify areas where layers are improperly bonded or physically defective.

Early detection of flaws enables manufacturers to prevent defective products from entering the marketplace — reducing potential recalls, liability and reputational damage — but also facilitates design and production changes to eliminate future problems.

The need to assure quality is driving the adoption of non-destructive battery inspection techniques. "SAM detects any degradation or change in the mechanical properties of the Li-ion battery cell. For example, is it swelling or disbonding?" says Hari Polu, president of OKOS, a US manufacturer of SAM and industrial ultrasonic non-destructive systems.

"The technology monitors what the chemistry is doing to the mechanical construction of the package. This becomes critical as Li-ion battery production ramps up and there's increasing variation in physical form factors."

With SAM, the sound hitting the object is either scattered, absorbed, reflected, or transmitted. By detecting the direction of scattered pulses as well as the 'time of flight', the presence of a boundary or object can be determined as well as its distance. Samples are scanned point by point and line by line to produce an image.

Scanning modes range from single layer views to tray scans and cross-sections. Multi-layer scans can include up to 50 independent layers. Depth-specific information can be extracted and applied to create two- and three-dimensional images without the need for time-consuming tomographic scan procedures and more costly X-rays. The images are then analyzed to detect and characterize flaws.

SAM can identify defects as minuscule as 50-microns, and is used in the semiconductor industry as a technology for failure analysis and reliability detection.

According to Polu, effective testing for Li-ion battery flaws across the diverse form factors utilized requires expertise in SAM technology as well as customization to the specific application.

Li-ion battery cells can be packaged in various sizes and shapes such as square, round, and pouch to optimize how energy is stored and delivered. The different packaging requires adjustments in the manufacturing process along with reliable quality assurance to detect defects.

For some types of inspection, such as for EV Li-ion batteries, an immersive type of SAM is proving effective. Here battery components are submerged in a fluid (typically water) to facilitate the transmission of ultrasonic waves during scanning.

Custom, low-frequency transducers are utilized, serving as both a transmitter and receiver of ultrasonic sound waves. For thick materials, high-frequency ultrasound (which provides high resolution) cannot penetrate deeply enough. The lower-frequency ultrasound can penetrate deeper into thick packages but has lower spatial resolution.

A transducer generates ultrasonic waves when a voltage is applied to them and can turn ultrasonic waves back into voltage. Combined with the shape of the lens on the transducer, frequency and focal length can be controlled to provide the best results when inspecting the internal characteristics of samples.".

"For thick battery packages like EV vehicles, we use low-frequency, highly customized transducers to penetrate through the parts. The special transducers need to have very high surface penetration to a depth of approximately 5mm while still maintaining resolution.," says Polu.

OKOS designs and manufactures a large variety of transducers up to 300MHz for different applications. Some transducers require direct contact with a material to operate, others use an air gap or are immersed in a fluid, usually water, in order to better transmit the sound through a material. Transducers come in a variety of sizes and shapes for different applications.

Among the specialized transducers for custom applications are phased array transducers, which contain multiple elements unlike the single element in other transducers. The transducer can also be curved in shape, which allows for faster scans as the elements simultaneously brush over samples and faster scans of curved surfaces.

Using constructive interference between the elements, focal lengths can be changed at any time to achieve the best results. Phased array transducers are typically 20 MHz or below.

According to Polu, special transducers and software enables efficient detection of Li-ion battery defects across a wide range of form factors.

"It's a combination of using the transducers to measure signals along with software to extract features out of a noisy environment. It's like the Hubble Space Telescope: you need to detect one small feature [the potential defect] amidst a lot of noise," says Polu.

He anticipates SAM technology will become increasingly automated to ensure Li-ion battery performance as production volumes continue to rise.

This is similar to EV battery inspection. "Initially, they tried to ascertain the failure modes of Li-ion batteries Once achieved, implementing quality assurance is the focus — no one wants to drive an EV if battery safety is in question," he says. ■

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The theme of this edition will be lithium and the future of the lead battery industry, being this, so, the focus of our Conference presentations.

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11th International BCI Meeting

June 2-5
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This meeting should, like its predecessors, contribute greatly to BCI research and development. BCI Society members in good standing are invited to submit workshop proposals, abstracts for oral and poster presentations, and applications for the BCI Global Plenary Session for the 2025 BCI Meeting, at the Banff Centre for Arts and Creativity.

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The Battery Show Europe

June 3-5
Stuttgart, Germany

Meet battery manufacturers, suppliers, engineers, thought leaders and decision-makers for a conference and battery tech expo focused on the latest developments in the advanced battery and automotive industries.

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Battery and Critical Metals Recycling Conference 2025

June 9-10
Nashville, Tennessee, USA

The world is witnessing an exponential increase in electronic consumer goods, industrial and commercial equipment, and the adoption of electric vehicles. Consequently, there is an overwhelming surplus of discarded batteries. Shockingly, only a small portion of these batteries are being properly collected and recycled. In a society where stored power plays a vital role, it is imperative to recycle batteries to not only harness their raw materials but also to preserve the environment and safeguard valuable assets.

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Battery Recycling Conference & Expo

June 11-12
Messe Frankfurt, Germany

Battery Recycling Conference & Expo 2025 is the must-attend event for battery producers, recycling companies, critical raw material suppliers, and the entire battery supply chain to come together to discover the latest innovations and solutions to create a circular economy for used batteries and help create sustainable supply chains for the future.

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Advanced Automotive Battery Conference Europe

June 23-26
Mainz, Germany

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Pb2025 is organized by ILA, the only global trade association dedicated exclusively to representing lead producers and supporting a sustainable future for lead.

Many ILA members are recycling lead from end-of-life products, contributing to a circular economy by creating economic value from waste. ILA members also produce lead from mining, smelting and refining of lead from ores and concentrates. Associate members include companies with a direct interest in lead and its many important uses.

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April 16-17, 2025 | Georgia World Congress Center, Atlanta, GA

The Battery Show Europe
Electric & Hybrid Vehicle Technology Expo Europe
Energy Storage Germany
June 3-5, 2025 | Messe Stuttgart, Germany, DE

The Battery Show Asia
Mobility Tech Asia
July 15-17, 2025 | Asia World Expo, Hong Kong

The Battery Show India
September 17-19, 2025 | India Expo Centre, Greater Noida, India

The Battery Show Asia (Indonesia)
September, 2025 | Jakarta, Indonesia

Battcon 2025

August 3-6
Orlando, Florida, USA

The Battcon technical committee is seeking abstracts (to eventually become papers if accepted) for peer-review, by Battcon. The published papers will be available on the Battcon website archive.

The papers focus on stationary batteries, geared mostly towards an end-user audience.

Feel free to submit a non-commercial (focus on the technology, method, or standardized practice, not the product or company) abstract on whatever subject related to stationary batteries you think might have an interest to an end-user audience consisting primarily of electric utility, data center, telecom, firefighting professionals, and stationary battery service companies.

Contact
www.battcon.com
E-mail: Events@Battcon.com

The 9th World Battery & Energy Industry Expo

August 8-10
Guangzhou, China

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August 18-19
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RECYCLE 100 — 9th International Secondary Lead and Battery Recycling Conference

September 1, 2
Kota Kinabalu, Malaysia

Time flies — and so does innovation in our industry! Fourteen years ago, we gathered in Macau, China, for the very first Secondary Lead Conference, bringing together all sectors of the lead-acid battery recycling and smelting industry.

Since then, this conference has evolved into a platform for critical discussions, debates, and shared learning. Over time, the battery recycling world has expanded, and now, we find ourselves on the cusp of an exciting new era: Lithium-ion battery recycling.

In response to this rapid development, even traditional lead recycling companies are investing in their knowledge and capabilities, preparing to meet the challenges and opportunities posed by this new frontier.

With great pleasure, we invite you to RECYCLE100, the 9th International Secondary Lead and Battery Recycling Conference. This year's event will dive deep into both technical and market aspects of battery recycling across multiple chemistries.

While the industry is evolving, the core themes of our conference remain unchanged. You'll hear from global experts in recycling, smelting, and environmental sustainability as they share best practices for collecting, processing, and recovering valuable elements — whether from lead-acid or lithium batteries.

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With the continued support of our industry partners and loyal sponsors, I warmly welcome delegates and their partners to join us in Kota Kinabalu, Sabah, Borneo for what promises to be an insightful and impactful event.

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September 10 - 12, 2025, Valencia, Spain

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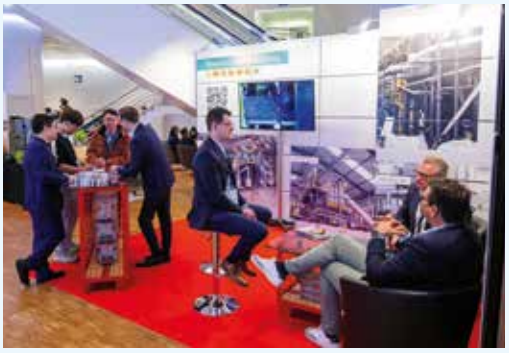

ICBR Asia 2025 | IARC Asia 2025 | IERC Asia 2025

November 11 - 14, 2025, Shanghai, China

As ICM returns to Asia, join experts from around the world to discuss the latest advancements in circular economy, e-waste management, and sustainable resource recovery. Plus, get exclusive access to plant tours, offering invaluable insights into leading remanufacturing and recycling facilities.

For the first time, the three leading recycling congresses **ICBR Asia, IARC Asia, and IERC Asia** - come together in Asia, creating a unique platform for industry leaders to connect and learn.

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21st Asian Battery Conference 2025

September 2-5
Kota Kinabalu, Malaysia

With great pleasure, I warmly welcome the delegates of the 21st Asian Battery Conference convening in Kota Kinabalu, Malaysia. This esteemed gathering takes place in the capital of the State of Sabah under the backdrop of Mt Kinabalu.

Even in "far off" places such as Borneo, the lead-acid battery plays a vital role in people's lives, from its traditional automotive role to remote energy storage and backup systems.

We must continually assess where the energy market is moving and ensure we are at the forefront of these changes. The many challenges we face do not get any easier, but I'm sure there will be rigorous discussion and debate on this and many other topics during the week.

Contact
https://asianbatteryconference.com/
E-mail: events@cw3.co
Phone: +61 3 9870 2611

International Congress for Battery Recycling ICBR2025

September 10-12
Valencia, Spain

ICBR 2025 is the international platform for reviewing the challenges faced by the Battery Recycling Industry on a global basis.

For 30 consecutive years, ICBR has brought together the international community of experts and decision makers of the entire Battery Recycling value chain, including battery recyclers and manufacturers, collection organizations, OEMs, policymakers, materials and services providers and many more.

Contact
www.events.icm.ch/event/ICBR2025/icbr-2025
E-mail: info@icm.ch
Phone: +41 62 785 10 00

Energy, Fuels & Decarbonization Expo

September 17-18
Birmingham, UK

The UK's Leading Expo for Energy from Waste, Bioenergy, Alternative Fuels, and Carbon Capture, Utilisation & Storage Solutions. Join hundreds of engaging conversations, strategic meetings, and thought-provoking presentations at this two-day event dedicated to energy management, alternative fuels, and clean energy innovations.

Network with potential customers, suppliers, and partners who can revolutionise your perspective and open doors to new opportunities.

Contact
www.ess-expo.co.uk/efd
E-mail: info@ess-expo.co.uk
Phone: +44 20 8126 4523

Battery Korea 2025

September 22
Seoul, Korea

Battery Korea will provide a variety of up-to-date information, including R&D strategies and recycling related to next-generation batteries, development status and commercialization strategies of high-performance batteries, innovative battery production and manufacturing techniques and safety enhancement, and battery management systems.

It is also a venue for business networking to share information and trends on the latest EV-related technology trends, market forecasts, and investment strategies.

Contact
www.batterykorea.org/eng/main.asp
E-mail: battery@infothe.com
Phone: +82 2 719 6933

The Battery Show

October 6-9
Detroit, Michigan, USA

This premier event brings together engineers, business leaders, top-industry companies, and innovative thinkers to discover ground-breaking products and create powerful solutions for the future.

With over 21,000 industry professionals, attendees will enjoy four full days of educational sessions, networking opportunities, and a chance to discover the latest market innovations from more than 1,300 exhibitors at one of the world's largest battery technology trade shows.

Contact
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Energy Storage Global Conference 2025

October 14-16
Brussels, Belgium

The Energy Storage Global Conference (ESGC) offers a unique opportunity to industry, researchers and policymakers to exchange views on key issues faced by the energy storage sector.

During three days, representatives will meet in Brussels and online for the 8th edition, at Hotel Le Plaza. the future storage market, and the latest developments in energy storage technologies.

Contact
www.ease-storage.eu/easeevents/energy-storage-global-conference/
E-mail: info@ease-storage.eu
Phone: +32 2743.2982

Flow Batteries North America

October 27-29
Chicago, Illinois , USA

Flow Batteries North America, the first dedicated conference bringing together industry leaders, researchers, and innovators in flow battery technology.

As the energy storage landscape evolves rapidly, flow batteries are emerging as a crucial solution for grid-scale storage, renewable integration, and sustainable energy futures. This pioneering event offers sponsors unprecedented access to key decision-makers, technical experts, and market innovators who are shaping the future of energy storage.

By participating in FBNA, you'll position your brand at the intersection of innovation and commercial opportunity in one of the fastest-growing segments of the energy storage market.

Contact
www.batterycouncil.org/event/flow-batteries-north-america/
E-mail: media@batterycouncil.org
Phone: +1 312 245 1074

Automotive USA 2025

October f29-30
Detroit, Michigan, USA

In an era of unprecedented change, the automotive industry is undergoing a revolution. As software-defined vehicles, electrification, and autonomous technologies converge, the next decade will be shaped by those who dare to innovate, adapt, and lead.

This is the moment to redefine the future of mobility, and we invite you to be part of it.

At Automotive USA, you'll be in the company of the industry's most influential minds. This is a rare opportunity to connect with the people who are shaping the future of the automotive sector.

Our speaker faculty boasts 70+ expert thought leaders, each handpicked for their unique insights and expertise in navigating the complex landscape of technology, manufacturing, and strategy.

Contact
www.events.reutersevents.com/automotive/automotive-usa/
Phone: +44 207 375 7500

The Battery Show India

October 30-November 1
India Expo Mart & Centre, Greater Noida

Welcome to the third edition of The Battery Show India, where brilliance meets innovation! Join us as we unite engineers, business leaders, top-in-dustry companies, and visionary thinkers from across the globe.

Together, we'll unlock the door to ground-breaking products, explore the latest advancements, and forge powerful solutions that will shape the future.

Contact
www.thebatteryshowindia.com/
E-mail: Pankaj.sharma@informa.com
Phone: +91 99713 65776

ICBR Asia 2025

November 3-5
Shanghai, China

Join the three leading co-located congresses in battery, automotive, and electronics recycling! Three congresses in one, creating a unique platform for industry leaders to network and exchange.

As ICM returns to Asia, join experts from around the world to discuss the latest advancements in the circular economy and sustainable resource recovery. Plus, get exclusive access to plant tours, offering invaluable insights into leading remanufacturing and recycling facilities.

Contact
https://icm.ch/
E-mail: info@icm.ch
Phone: +41 62 785 10 00

Batteries Event

November 4-6
Lyon, France

This year Batteries Event 2025 will celebrate its 27th Anniversary, with a new format from Tuesday 4 November to Thursday 6 November at the Lyon Convention Center.

As always, our aim is to create the perfect forum where all the battery industry stakeholders will be able to meet and discuss industry trends and best practices – from the battery production to its recycling.

Contact
www.batteriesevent.com
E-mail: laurent.pillot@batteriesevent.com
Phone: +33 9 70 26 80 67

Thermo Management Expo Europe

November 11-13
Stuttgart, Germany

Join us at Europe's only free marketplace for thermal management systems, components, and materials. This is the only place where you can connect with the thermal industry's leading suppliers, network with peers from across the supply chain, and gain insights from thought-leaders that are driving the industry forward.

If you need any type of thermal solution that will optimise the performance and efficiency of your applications...then this is the show for you!

Contact
www.thermalmanagementexpo-europe.com
Email: info@thermalmanagementexpo-europe.com
Phone (Europe): +44 208 052 2770
Phone (US & Canada): +1 855 436 868

Battery Asset Management

December 2-3
Rome, Italy

Our 2025 edition will focus on three core themes: Revenue & Trading, the Lifecycle of the Battery, and Optimization Tools for Success. 2025 will see markets such as the Nordics, Iberia, Italy, Germany, UK & Ireland, and the Benelux region, all with market deep dives, helping you to understand how you can position yourself as the front runner with all things Battery Asset Management.

Contact
www.batteryeurope.solarenergyevents.com
E-mail: SM.Battman@informa.com
Phone: +44 207 871 0122

7th India International EV Show 2025

December 5-7
Pune, India

India International EV Show (IIEV Show) is India's largest gathering of the Electric Vehicles Industry, it is coupled with the vast opportunities and potential challenges of EV development in India.

It is a common platform which unites engineers, mechanics, scientists and decision-makers to solve problems across the electric vehicle and advanced battery industries. This show capitalizes on the latest EV trends and exchanges groundbreaking ideas with experts and industry visionaries on trending topics including battery technologies, energy storage solutions and developing charging infrastructure.

India International EV Show 2025 is an International Exhibition for the Growth of Indian E-Vehicle Industry, it will focus on ensuring an enabling environment for the commercialization of electric vehicles in India and realizing the EV Industry's potential.

Contact
www.iievshow.com/7th-edition-iiev-show-pune
E-mail: info@iievshow.com
Phone: +91 956 0450076

This year's Smarter-E Europe didn't disappoint. How could it when everyone who is anyone in the new world of the European energy business was there?

The 'Goliath' of all conferences returns

Four exhibitions. 19 halls. 2,740 exhibitors. Nearly 110,000 attendees from 157 countries. Not bad statistics for any conference and exhibition. And this year's Smarter-E Europe can only be summed up in one word. Impressive.

The exhibition, which ran from May 7 to May 9, contained some of the largest exhibitor booths known to man. Or at least seen by *Batteries International*. Perhaps not the size of country mansions but certainly that of a substantial family home.

Billing itself as Europe's largest and most international exhibition for batteries and energy storage, the goal of the smarter-E Europe is the largest alliance of exhibitions for the energy industry.

It certainly delivered in size and much more, including several blisters on feet — you definitely need a pair of comfortable trainers if you're going to get around all the exhibition halls over the three days.

"I've attended ees in Munich in all its iterations over the years," one exhibitor told Batteries International. "And I have to say the mood this year is again a strange one. Last year there was a feeling of uncertainty when talking to people here. The elephant in the room was China — none of us knew what was going to happen. Was the EU going to try to erect a tariff wall against Chinese exports?

"This year all the talk was around Trump and the seemingly incomprehensible foreign policy of the US approach to tariffs. Imposing them, then restricting them. One moment they've placed the equivalent of an embargo on China then they show signs of relenting. It makes no sense. In financial markets uncertainty is the great killer of prices. In the new energy world it's a disincentive for development."

Certainly, this view was expressed in a different form at the recent Battery Council International event held in Texas two days ahead of the show.

But embargo or no embargo Chinese firms were present in force with impressive stands dotted around the halls. CATL, by far the world's largest lithium cell manufacturer, had a huge presence. As did China's highly successful battery maker and EV maker, BYD. Both had extremely busy exhibitor spaces with potential customers and competition eager to know more.

One of the oddities of the exhibition floors was the profusion of Chinese cell manufacturers offering sodium-ion cells and a growing feeling that sodium-ion batteries are improving faster than expected — outside of China the general consensus is that sodium-ion will not be competitive with lithium-ion until the 2030s. CATL expects its sodium-ion batteries to reach similar energy densities to LFP this year and Hithium has introduced a 20,000-cycle sodium-ion battery.

With manufacturing scale increasing quickly, driven by their use in hybrid sodium-ion and LFP EV packs

This tariff policy makes no sense. In financial markets uncertainty is the great killer of prices. In the new energy world, it's a disincentive for development.

FOUR SHOWS FOR THE PRICE OF ONE

Attendees got four shows for the price of one. Bringing together Intersolar Europe, ees Europe, Power2Drive Europe and EM Power Europe the aim is to create a future-orientated energy world by shining a spotlight on renewable energies, decentralization and digitalization as well as cross-industry solutions from the electricity, heat and transport sectors for a sustainable 24/7 energy supply.

for fast charging capabilities, sodium-ion BESS may become economical sooner than lithium manufacturers would like to think.

Some of the grand names in the automotive industry were exhibiting too. They ranged from the old established firms such as Rolls Royce to the newest (and perhaps loudest) kid on the block being Tesla, which also had a wide range of energy storage solutions for the home and most particularly showcasing its Megapack technology.

Indeed, some energy management systems have become a battlefield for players from different sectors, including independent providers, energy infrastructure providers (such as Schneider Electric, Siemens) and heat pump manufacturers.

While different player archetypes still have separate strategies (independent providers are usually hardware agnostic, manufacturers focus on their own products), we may see more uniformity as installer acquisitions increase and the market saturates.

This half-eerie sense that things could suddenly change — and to most people's disadvantage — was however mostly confined to worries over US president Trump.

The previous year's fears over the composition of the next European Parliament had been dissipated. "It's clearly been business as usual at the top," said one delegate. "For myself, I believe the energy transition is unstoppable, Goliath exhibitions like this can only get bigger and more important. The only issue is one of timing." ■

AND THE WINNERS WERE ...

This year's winners — there were 15 in all — were divided into four categories: energy storage, e-Mobility, smart integrated energy and outstanding projects. The awards were given out the evening before the exhibition started.

The winners in the energy storage category were:

CMBlu Energy — *Organic SolidFlow Battery*
The organic SolidFlow battery by German company CMBlu Energy combines high performance with low environmental impact. Series production is set to start in 2026. The long-term storage system can store 200 kWh of electricity and have an output of 40kW. The design is modular and scalable up to the gigawatt hour range and can store energy for several days.

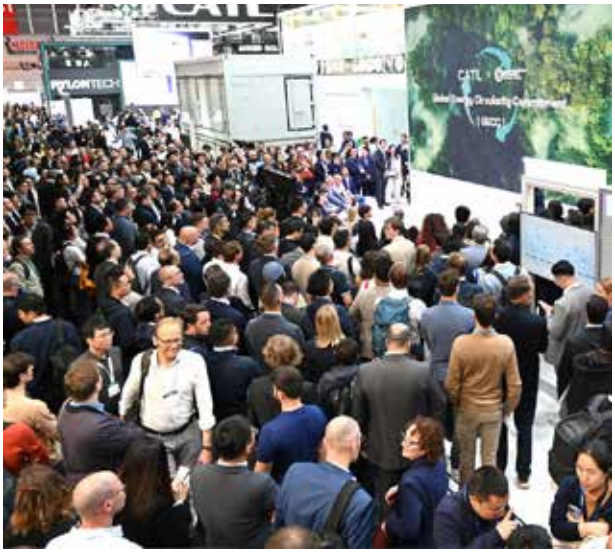
The design uses no rare or problematic materials and is 100% recyclable components. The chemistry combines solid organic polymers with an organic, metal-free electrolyte. The company claims that the battery has in excess of 20,000 charging cycles and a DC-DC efficiency up to 90%.

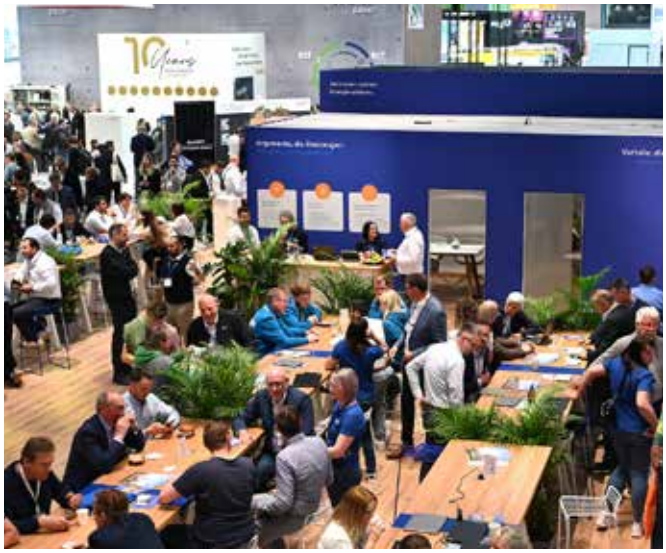
Hydrostor — *A-Compressed Air Energy Storage (A-CAES)*
Hydrostor is a Canadian company founded in 2010. The company's Advanced Compressed Air Energy Storage (A-CAES) technology provides compressed air storage for utility companies and municipalities. The system uses purpose-built hard-rock caverns by filling them with compressed air and water and offers storage durations of between eight and 24 hours.

The high energy density is achieved through hydrostatic compensation, in which a water column controls the air pressure The A-CAES uses a thermal management system that retrieves and reuses waste heat from air compression without any need for fossil fuels. With a service life of up to 50 years and no performance loss, the A-CAES provides a safe and reliable energy storage option.

Samsung SDI – *U8A1 (a five-minute backup solution for UPS)*
The Samsung SDI U8A1 is an ultra-high-output battery system for uninterruptible power supply systems based on lithium-manganese-oxide (LMO) battery chemistry, which enables quick charging and discharging while maintaining a high level of thermal stability.

The U8A1 can deliver power for five minutes at a discharge rate of 8C and 645 amperes. The rack and temperature control make for an extremely small footprint — just 1.36 square meters for a 1MW UPS system. Samsung SDI offers a 10-year warranty and a 15-year battery service life.





Deep in the heart of the Lone Star State something strange was happening. A weary Longhorn tethered to a tree saw it all. So, luckily, did we...

They say everything is bigger in Texas. This year's BCI was no exception

There aren't many events in the battery industry where you can bring together several hundred delegates, ply them with Margaritas for three days, throw in an apocalyptic speech on the death of China and a cowboy hat-making bar on the same day, and then, just for good measure, wheel out some long-suffering beef cattle just for photo opportunity kicks.

But this is BCI and as we all know, when it comes to our annual industry shindig, they like to go the full nine yards.

The hot topic this year didn't take much guesswork. Tariffs. BCI is traditionally a non-partisan, non-political gathering, but Trump's recent tariff Armageddon — irrespective of the strategies behind his decision making — is affecting huge swathes of North America's lead battery industry. All agreed that an already disrupted supply chain was being ruptured further. "What we're seeing here is a further move away from globalization," said Scott Fink, president of SY. "We're now moving into a time of greater regionalization."

For the publicly quoted manufacturers there was talk about how the valuation of their companies (and hence their credit terms and access to capital) was shifting wildly.

Dave Shaffer, retiring CEO of EnerSys, later said that the value of his firm had moved up and down by close to $900 million over the past few months.

There was also a heated debate over whether the tariff war would create any winners for the US.

Peter Zeihan, plenary speaker, thought that there would be no immediate gain for immediate manufacturing. "The very best case scenario for this would be Q3 2027," he said. "The chaos, the dysfunction that we're experiencing right now means we have at least another two years of that best case scenario. But I think 12 to 20 [years] is a more realistic estimate."

Other delegates were more positive. They noted that although decisions to make gigafactory-sized investments had taken years to come to fruition, the recently announced deals being announced had created a more positive financial atmosphere.

Another much discussed topic was the related issue over the role of China in the world energy storage and EV businesses of the future. Here too, the divisions were equally stark. Would the US industry be swamped by cheaper batteries and EVs from China or would the apparent embargo on products backfire on North American firms with manufacturing plants in China?

But there were lighter moments too.

Chris Pruitt, CEO of East Penn and retiring chairman of BCI welcomed Mike Judd, Stryten CEO to give the opening speech as his replacement.

Mike kicked off proceedings with a

hilarious tongue-in-cheek turn on the usual housekeeping rules for evacuation and had delegates roaring with laughter as he reminded them all that in the case of a medical emergency, only the very fit should attempt to run all the way back to reception to collect the defibrillators.

"Oh, and you might want to pick up two," he said. "Because by the time you've run all the way back, past Starbucks, and down the escalator, you're probably going to need to use one on yourself."

A quick introduction showed him revealing his 1991 ID card – a photo of himself freshly starting out in the battery business – which prompted a wave of affectionate laughs (pictured below).

It was a warm opening to his speech and certainly did more than the coffee to wake everybody up. Then he promptly moved on to more serious issues, outlining the importance of all BCI members getting out and telling the story of the lead battery industry and participating in national and global conversations on energy, security, and innovation.

As we all know, a successful convention is so much more than the speeches from a podium, and some of the regular fixtures of the BCI annual get together are much anticipated.

In particular, the golf tournament was a resounding success. We were, after all, in one of the Marriott's flagship golf resorts with not one, but two, championship courses hailed as the best in Texas.

But something that always makes BCI stand apart from other industry conventions is the planning and care that goes into their evening functions and creating a convivial environment for long-standing friends and colleagues to kick back.

This year's opening reception, held outside in the hotel grounds, was a fiesta of colour under a blazing evening sun. You know an event is going to go with a swing when there's bunting, bars, and a live country band.

A raffle for a pair of genuine Texan boots was held at the entrance with the money raised to help the council's scholarship awards from its recently created BCI Foundation.

Other events of note were the Innovation and Amplify Awards ceremonies and a special pause in the closing drinks evening where Chris Pruitt and Dave Shaffer received the council's Distinguished Service Award. (See People section in this magazine for further details.)

A fairly new, but now highly popular, fixture in the three day timetable is the annual WGBI (Women in the Global Battery Industry) drinks reception. Whoever had the idea to set up a design-your-own cowboy hat bar needs an immediate promotion. There was much hilarity as the cocktails flowed and everyone personalized their own head gear. Great idea. Iconic takeaway.

Notable too, was the successful poster competition, and a guest appearance by the afore-mentioned Longhorn bull, brought in for those all -important selfie opportunities. We won't embarrass anyone by naming and shaming the delegates who were spotted using his horn as a bar to balance their drinks on. He didn't look like he minded too much, but then who knows? Waivers had to be signed first just in case.

So that's a wrap folks for another stonking year. But a final nod must go to Roger Miksad, BCI president and executive director.

"Roger has turned BCI round since he's been at the helm," one lead manufacturing CEO told Batteries International. "He's given it a fresh sense of purpose and as an industry we have a much greater visibility now.

"Our relevance to the US economy has historically not been recognised at Capitol Hill or, indeed, by the general populace. Roger has, and continues to, change that enormously and we couldn't be more grateful." ■

A new conference event and exhibition was launched this spring. It proved to be a remarkable success touching the raw nerve of a continent that is worried that China poses an existential threat.

‘Yes, Europe can compete with Asia’

A must-attend event that popped out of nowhere. That’s probably the best description of the Battery Event which suddenly came to prominence at the start of 2025.

But a success it clearly was, attracting dozens of exhibitors and around 400 national and international delegates. A similar event is planned for roughly the same time and place in 2026.

The choice of location was also unexpected — Dunkirk is not near any major airport with London Gatwick and Paris Charles de Gaulle being virtually equidistant.

But, there was method in the madness! In his opening presentation Avicenne Energy’s Christophe Pillot, and the organizer of the event, explained the logic behind the choice of venue. “France represents 14% of European gigafactory activity,” he said. “But the Haut de France region [the north-east corner of the country] represents about 90% of French capacity and some 57% of that is situated very close to Dunkirk.

“We are in the heart of France’s lithium ion corridor.”

This the organizers used to best purpose. In the pre-conference run-up delegates were offered an afternoon’s visit of a choice of sites to other firms in the region. The two most popular turned out to be visits to Verkor and ACC-Automotive Cells Company two gigafactories and EV manufacturers in the making.

Verkor — the new lithium giant on the block — was only founded in 2020 and yet by October last year had secured a €1.2 billion to build a gigafactory near Dunkirk.

ACC has a much longer pedigree but has only recently moved into lithium ion battery manufacture. It says it aims by 2030 to be what it calls ‘smart manufacturing’ some 2 million batteries a year accounting for some 120GWh of power.

One strong message coming from the general conference preamble was that Europe could compete with Asia on price.

“The biggest costs in lithium battery making are the chemicals, the capital-intensive manufacturing process and the cost of energy,” said one delegate.

“In these three areas, there is no competitive disadvantage with Asian manufacturers. The share of labor in the overall cost of a battery is limited, and the difference between that cost in Europe and Asia is offset by the price of shipping the battery here.”

That view was modified in the opening session led by Christophe Pillot when he presented an overview of the energy storage market and showed a drone’s eye view of BYD’s proposed manufacturing area. “It’s about the size of San Francisco,” he said. A striking thought that was a talking point at the first coffee break.

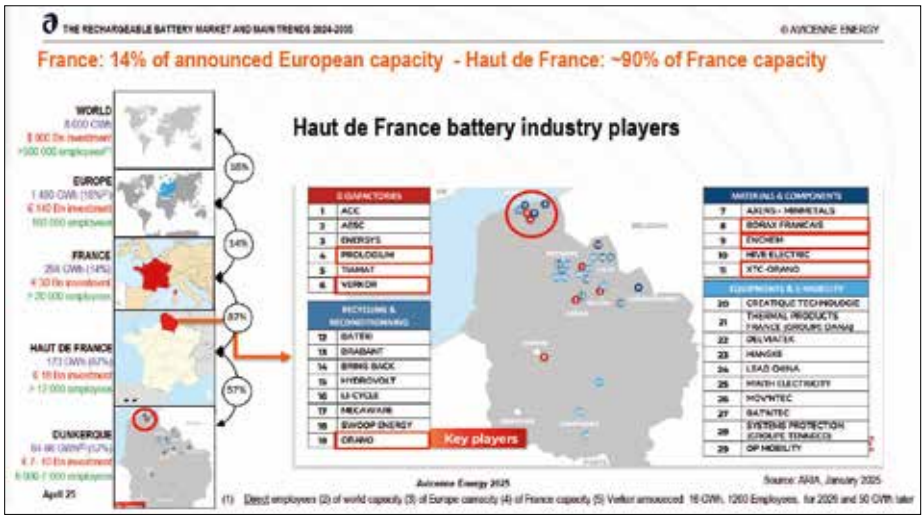
There was a strong and varied showing of exhibitors at the event. The overall impression was that there was a slight preponderance of battery recycling and testing firms reflecting two of the main concerns gripping European businesses.

Recycling, however, was mostly only taking the process as far as collection of the batteries and grading them into black mass.

Full recycling as an industry is still relatively undeveloped in Europe mostly because the volume of batteries to be collected is still relatively small.

The first full day of the conference closed with opening drinks at a welcome party on the fifth floor of the nearby building. There were spectacular views of the sinking sun, the misty sea and the docklands of Dunkirk in the distance. As the networking began aided with plentiful canapés, wine and beers an exuberant saxophonist played in the background.

It was a great close to the first full day of a conference that looks set to be a permanent fixture of the European battery scene. ■



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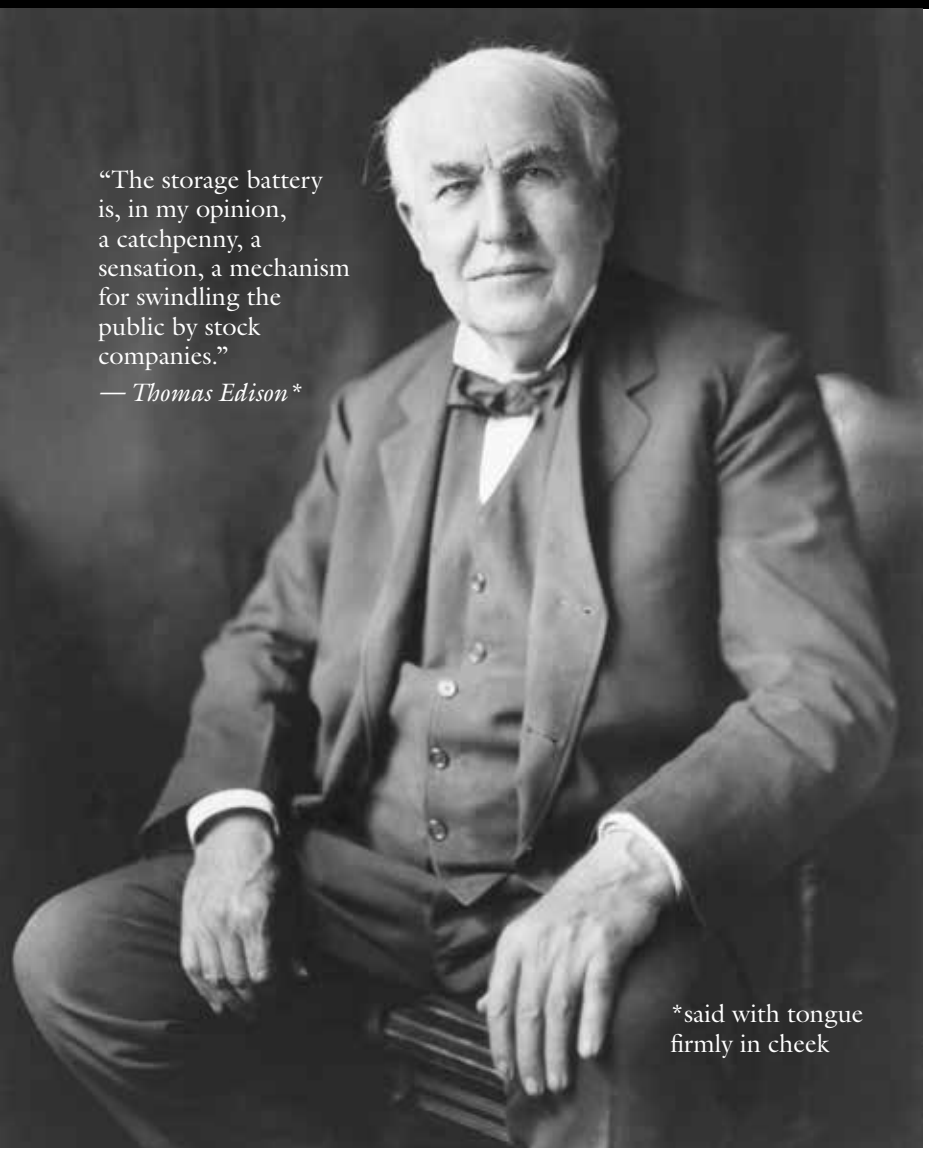
THE LAST WORD

The bitchiness of the long distance batteryman



"The storage battery is, in my opinion, a catchpenny, a sensation, a mechanism for swindling the public by stock companies."
— *Thomas Edison**

*said with tongue firmly in cheek

Myth-making may be part of the human psyche, but it's also been a particular characteristic of the battery industry.

So, in the US, Thomas Edison kicked some of this off with his much-quoted (in fact totally over-quoted) … "The storage battery is, in my opinion, a catchpenny, a sensation, a mechanism for swindling the public by stock companies."

Irrespective of what a catchpenny was, he didn't like it. But nor did he like mentioning the very inconvenient truth that the storage battery eventually became Edison's most profitable product," according to a US government report.

Nor did Edison mention his legal tussles with Waldemar Jungner over the nickel-iron battery that he claimed to have invented in 1901 unlike the poor Swede who had filed his patent three years before.

A glance through the history of alternative battery chemistries reflects the myth-making obsessions of the past 30 years.

In no particular order, the lead battery industry has been deeply troubled — and so characteristically rude and dismissive — about supercapacitors, fuel cell batteries, lead carbon batteries (with or without foam) and much, much more…

This culminated in the early 2010s with another wave of myth-making and hearty disdain for the humble lithium battery exploding in aircraft, catching fire in torrential rain and generally being little more than a rich-man's excuse for a show-off car.

"I wouldn't let my daughter drive an EV, though my wife is another matter" was an apocryphal joke of the time.

There was a partial truth there but buried in a hype so outlandish that few were aware that every lead battery firm of note was investing huge amounts of money into looking at how to manufacture lithium ones.

The myth-making saga around this time flipped over to the lithium brand of advanced truth-telling. This reporter remembers being summoned — not asked but summoned — by an A123 salesperson to inspect a lithium battery that looked exactly like a 12V starter battery. "This is the future" the salesperson sighed with pride.

When repeatedly asked to say how much this marvellous invention would cost — we estimated around four figures it was 2012 after all — he said (pointedly) that that was irrelevant and they had at least got rid of that poisonous lead. (And, yes, the door was that way.)

Even then certain elements of that side of the business didn't like talking about some of the fun chemicals ang gases lithium hexafluorophosphate or hydrogen cyanide and hydrogen fluoride released when battery fires occur. ■

HAPPY 60th BIRTHDAY MAC

There was no escape from the MAC birthday celebrations at this year's BCI convention. But the party hats, cupcakes were not for Doug Bornas whose birthday is around this time or Jimmy Stewart (see elsewhere in the magazine) notching up 50 years in the battery world. No the candles were to celebrate the firm's 60 years in business — what a way they've come since Ken McGowan's groundbreaking idea, back in 1965, to automate the cast-on-strap process. They built their first machine in Ken's garage marking the birth of MAC Engineering & Equipment.

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