

Alfons Westgeest, executive director of the Association of European Automotive and Industrial Battery Manufacturers (EUROBAT), talks to **PEN** about developments in batteries powering future energy and transport networks

The power of storage

Battery storage technologies continue to play an ever important role within the energy and transport domain. The industry body EUROBAT plays a leading role in the area, engaging with technical and policy developments. Here, the organisation's executive director, Alfons Westgeest answers PEN's questions – showcasing recent EUROBAT activity and the road ahead for battery developments.

EUROBAT's annual forum highlighted that the potential of battery technologies remains untapped – what do you feel should be the major policy prescriptions at EU and member state level to help overcome this?

One main policy that we need is around consistency, reasonability and stability of the regulatory framework in Europe. For example, there is an overlap between the REACH Regulation and the End-of-Life Vehicles (ELV) Directive. After working with its officials, this potential overlap was recognised by the European Commission. Indeed, the ELV Directive already provides measures regarding lead-based batteries and any authorisation process under the REACH Regulation would thus overlap with revisions of the exemption for lead in batteries under the ELV Directive. EUROBAT continues to work with the EU in finding efficient environmental health and safety rules for the lead-based batteries as well as nickel, lithium, and sodium-based batteries.

Regarding the new market opportunities, we would like to see strong European support to secure access of battery storage solutions in the grid. New grid technology is continually being introduced, especially in countries that are updating their service levels to those of the rest of Europe. The so called 'grid-code' is under discussion between regulators and the electricity industry, including generation, transmission, distribution and storage. We advocate all four major battery technologies and hope they will be recognised for system solutions, bringing renewable energy to the grid.

In addition, EUROBAT promotes battery technology for local smart grids and rural electrification to balance electricity generation and storage. On 1 May 2013, Germany introduced subsidies for battery storage in combination with



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small scale solar photovoltaic (PV) installations. EUROBAT agrees that subsidies can help stimulate early market introduction. Italian transmission and distribution operators have also opted for storage with investment in the range of €1bn.

How are you reacting to the development of efforts to agree a free trade treaty between the EU and the USA? In what ways does the EU battery industry stand to gain from this agreement?

International competition over the manufacture of advanced battery technologies is already strong, especially from Asian countries such as China, Japan and South Korea. However, EUROBAT considers that the European battery industry still has the potential to maintain its position of international strength, especially in relation to battery energy storage for grid-connected and automotive applications, as well as more generally in electrochemical engineering. European industry already holds a position of leadership in advanced lead-based battery technologies, but decisive movement is required from policy makers to maintain an equivalent position for the EV segment.

Historically, lithium-ion cells have primarily been developed for consumer electronics applications; a segment dominated by Asian battery manufacturers. This ready-made production and supply chain network has enabled Japanese and Korean battery manufacturers to react quickly to the initial demand for high performance NiMH and Li-ion cells for the automotive market. This, combined with prolonged government support through R&D subsidies, has allowed Asia to build up an early position of market leadership in competition with European and US industries.

However, European and US governments have also recognised the large growth potential of the supply chain for automotive Li-ion cells. By 2012, the US had allocated \$2.4bn (~€1.8bn) for investment into Li-ion battery R&D and manufacture, with their vibrant venture capital



The EUROBAT annual conference 2013

industry supporting several start-ups. To date, investment in Europe has been significantly lower. On a broader level, both the EU and US have implemented initiatives to develop e-mobility infrastructure; with President Barack Obama announcing his goal of putting one million vehicles on the road by 2015, and the EU setting targets for common charging points to be installed across Europe.

Clearly it is not going to be a smooth ride. Technology breakthroughs will lead to disruption of markets. We should also realise that there will be decades ahead whereby combustion engine technology will be combined with micro hybrid and full hybrid or plug-in solutions. This will create big opportunities for all battery technologies. The EU-US Free Trade Agreement would increase our chances and joint initiatives in the global competitive landscape.

As regards Horizon 2020, do you feel enough support has been provided to the battery industry – are you making efforts to open up research opportunities?

EUROBAT believes that the first round of Horizon 2020 research and innovation funding into energy storage should, as a priority, focus on improving the conditions for short-term market introduction of storage technologies into the European grid. In 2013, there is already a pressing demand for energy storage technologies to maintain grid stability and flexibility for grid operators and customers, especially in countries where PV or other renewable energy sources have reached a high penetration level.

We advocate that in order to quickly develop short-term and market competitive battery technologies for on-grid storage, at least 70% of European Union funding into the development of battery energy storage should be directed at technological improvements to existing and commercialised battery technologies – lead-based, lithium-based, nickel-based and sodium-based batteries – and their integration into different levels of the grid (both cell and systems-level research). The remaining 30% could then be used for basic materials research into new and untested battery concepts with the aim of improving the four current technologies.

Batteries have an advantage over other storage technologies because they are already available on the market to address the storage needs of

our customers. Demonstration projects serve to validate the combination of services that batteries can provide in this capacity, and would result in faster market deployment.

EUROBAT has also supported automotive industry efforts to develop a roadmap for the forthcoming 'European Green Vehicles Initiative' under Horizon 2020. With a wide range of vehicle concepts – each featuring different degrees of hybridisation and electrification – being developed by European car manufacturers, there is a recognised need for R&I to support battery development at all levels of e-mobility; from micro hybrid up to full electric vehicle segments.

What part can battery technologies play in helping Europe meet environmental and climate targets?

On a customer level, battery energy storage (BES) technology will already be an important means for homeowners and businesses to increase their percentage of self-consumed electricity from PV panels from a maximum 30% without storage to around 70%, reducing the amount of additional power needed from the grid. In the future, residential BES has the further potential to be aggregated and provide active grid support.

The market for grid-connected energy storage in Europe has high potential for rapid development, due to a combination of ambitious EU climate policies, the successful integration of renewable energy sources across member states, and a shared determination to achieve security of power supply. As such, market frameworks and standards for energy storage can be developed here first, making European industry best placed to provide the corresponding technological solutions.

In automotive applications, advanced lead-based batteries are already providing micro hybrid functionality in around 75% of new car models placed on the market by European car manufacturers in 2013. This results in fuel efficiency savings of 8-10%, with technology still being improved upon year-on-year. In hybrid, plug-in hybrid and full electric vehicles, lithium, nickel and sodium-based batteries provide varying levels of full electric propulsion, paving the way for a decarbonised European transport sector in the future.

The potential of Europe's existing battery industry is large, with over 25,000 employees across EUROBAT's membership of battery manufacturers. This industrial base should further be supported in maintaining its production know-how in the transition to new markets and advanced technologies with more complex electrochemical systems.

In particular, it will be important to improve the specialist skillset of Europe's workforce by strengthening the electrochemical and engineering competences developed through education and research.

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