

EUROBAT

emissions in the field of transport and energy supply. How do you think that batteries can contribute effectively to these goals and the goals set out by the EU Climate Change Package Targets?



Erwin Marckx, EUROBAT

Renewable energies are one of the methods to achieving an EU low carbon economy. The increasing share of renewables connected on the European grid is the best way forward but there are still a number of technical challenges to overcome, notably their integration to the grid. Batteries can do much more than store electric energy in a decentralized way. If correctly designed (1kW to several MWs) and integrated, they can also fulfill vital grid functions during generation (primary and secondary reserve power) and support the transmission (ancillary services) in order to maximize the integration of RES.

In the field of transportation, batteries can help in the further electrification of vehicles, from mild, full and plug-in hybrids to full electric vehicles. A major issue for all these technologies is increasing the energy efficiency and preventing the energy from breaking.

EUROBAT sees the EU Climate Change Package as an opportunity to position a product which can contribute in many ways to more efficient generation, use, distribution and grid integration of the different energy

sources. The EUROBAT White Paper can be downloaded from the EUROBAT website www.eurobat.org.

Q2: EUROBAT has a relationship with many ARE members, including the European Photovoltaic Industry Association (EPIA). EUROBAT and EPIA have developed a joint Working Group which seeks to define value streams for battery energy storage (BES) in PV market segments. How can BES provide, for example, reserve power capacity, grid stability and support renewable energy output in a more environmentally friendly manner than other technologies?

The Joint EPIA-EUROBAT working group has been in operation since 2007. The main target of this working group was the PV grid connected residential system, which covers a significant part of the PV market in EU. Based on real operational models we defined optimal solutions to combine most suitable storage components.

Where reserve power and grid stability is more of an issue for the transmission operator (TSOs), we mainly investigated the benefits and functions for grid-connected end-users (system owners) in the further liberalized energy market. The results of this working group were also the basis to set the directions for a standard for "grid connected RES batteries". The results were also used as input to the EC 'Strategic Energy Technology Plan (SET-Plan) and the solar initiative herein.

Q3: How hard is it to gain recognition of the role of batteries and Battery Energy Storage (BES) in the fight against climate change? Do you think the battery industry is underestimated in this regard?

Electrical energy can be stored in different forms, such as pumped hydro, compressed air, flywheels, thermal storage and hydrogen. But batteries should be distinguished from other storage devices because they are more efficient, both during use and at stand-by, therefore increasing the overall efficiency of current and future applications.

We believe that the battery component will play a much larger role in future smart grids, where bi-directional communication will allow decentralized storage to benefit end-users and electricity utility providers at the same time, generating value by "storing-selling". In this perspective, battery storage will compete also with electricity generating technologies, such as gas-turbines. EUROBAT feels that there is a growing consensus of the power and effectiveness of batteries which will only increase in the coming years.

Q4: How important is it to tailor specific battery needs around renewable energy needs? That is to say, do certain types of batteries, for example, lithium-based, have advantages over Nickel-based, and vice versa? Do all types of battery fulfill a role or is there a "one size fits all" approach for renewable energy?

Apart from the “technical characteristic” of the generation, for example wind versus PV, other factors need to be taken in consideration when selecting the right battery technology and size; such as the climate or environmental conditions, the characteristics of the application (battery depth of discharge) and the requirements regarding performance, life, safety and cost for a given application. Four battery technology families that can effectively contribute to the efficient and sustainable use of electrical energy storage are the lead based, nickel based, lithium based and Sodium based technologies.

Because of the diversity of possible operating modes, there is no single battery system or technology covering the entire range of needs adequately.

Q5: We see from a case study in the White Paper, that the use of BES in off-grid renewable energy systems can have numerous positive outcomes. In this particular case, the provision of energy storage capability for a peripheral hospital helps numerous people in Burkina Faso.

As we approach the UN’s 2012 Year for Sustainable Energy, how would EUROBAT define the role of batteries in bringing about clean, sustainable and renewable energy to those who need it? Can batteries play an important role in tackling energy and health poverty as well as climate change?

Batteries in off-grid systems are an obvious solution and application but need high attention as they need to be tailored to fulfill the function for what they are designed. Due to the rising price of oil and the difficulties in transferring to location, renewable energy and batteries are already more economically viable today than the classic diesel GENSET.

At the same time such systems do not emit CO2 and no transportation of fuel is needed during the whole life-time of the installation. Indeed, in hospitals and schools, for example, in rural areas this can make a substantial difference. Reliable and clean power generation and back up provided by renewable energy and batteries mean that there is greater power autonomy and ensures a more reliable service. It also ensures a cleaner local environment and facilitates development in a myriad of ways. For these reasons alone, RES and batteries should be championed and promoted.

The above picture shows Hansreudi Good, (Chair of Industrial Battery Committee Taskforce on Renewable Energies) and John Searle (EUROBAT Vice-President) EUROBAT Forum in Barcelona where the White Paper was officially released.

Q6: ARE is very much focused on off-grid renewable energy. What do you think BES can offer off-grid systems? How can BES contribute to the quality of energy provision in these situations as well as contribute to the environment and carbon cutting measures?

The value of energy storage is the availability of a permanent source of electricity, independent from the variable power generation. The quality of energy provision is something the designer of the system need to discuss with the user or owner. For industrial applications or large remote habitation application, energy storage is typically sized to be able to supply power from four up to ten days, to ensure that the application will always be powered should RES be limited for an extended period of time.

Another advantage from BES is that it increases the energy efficiency of the whole system because RES energy can be stored if not directly used, where otherwise it would have been lost. As energy generation and its storage is so important in off-grid areas, batteries fulfill an important role.

The perspective for storage is evolving with the changing perspectives for rural electrification. In the past we had either simple solar home systems, or some stand-alone PV to power professional or public equipment, with large storage systems ensuring the power supply for several days. Today’s view is that renewable energy can become an integral part of the power supply to regions or villages as a viable alternative to grid electrification. The concepts are based on intelligent mini-grids, often in hybrid configurations using different sources of generation. Energy storage is not anymore a simple back-up “just in case the sun doesn’t shine”, but much more.

BES needs to optimize, technically and economically, the usage of various generation and grid assets, including renewables, but also gas or fuel based generators. Typically, a fuel based generator can run at nominal regime, with much higher efficiency and lower cost if combined with a storage device, allowing operation at optimum regime and avoiding permanent on-off’s. Energy storage hence becomes an enabling

technology, with increased technical requirements fitting intelligent and dynamic use of a highly reliable and long lasting storage device.

Q7: In what ways can BES contribute to end users needs, particularly in the developing world, where power outages are common, that is if you are lucky enough to have access to electricity?

With the expertise in grid-connected systems, the battery industry will also contribute to the further integration of RES in mini-grid configurations. BES is very important for the optimization of such systems. On the contrary of what was earlier expected, grid infrastructures with high penetration of RES are as reliable as conventional networks if correctly designed. The BES component provides energy through power outage periods, for weak configurations, the capacity of BES should be tailored, depending on the load profile and requirements from the users.

Q8: Why does EUROBAT feel that being part of the ARE movement is so important? What role does ARE play in supporting the battery industry and BES, particularly in the off-grid sector?

EUROBAT decided to join ARE because of its mission statement and we believe the Battery Industry can contribute positively to identifying the technological gaps in the rural electrification process. Apart from the technical needs, EUROBAT is also interested in learning about the financial aspects and to understand the different business models installed or under development in the developing countries. The integration of RES in worldwide off-grid energy systems will bring synergy with Europe's Climate Action Plan and ARE is central to this.

IN FOCUS

Solux: Helping the development of Solar Power in Africa

Solux e.V. (www.SOLUX.org), a German NGO which develops mobile solar lamps for distribution in Africa and elsewhere, is highlighted in this edition of "InFocus".

Their motto is "sustainability improving the quality of life by the Solux Solar Light Concept", and they strive to improve the lives of the less prosperous people in the developing world by supplying them with mobile solar lamps and empowering them through capacity building designed to create a climate of self sufficiency.

We hear from Franz Keis.

One question which Solux often asks is: why aren't solar lamps produced in Africa? It is this fundamental question and problem which Solux has set out to answer.

In many regards, the knowledge needed to develop solar lamps indigenously is not easily found, particularly in rural areas. Confronted with this issue, in the early 1990s Solux started developing concepts to promote local production. The result was the creation of the "Solux Workshop Concept". At its heart was the development of a new type of solar lamp, which could be delivered in the form of a kit, ready for local assembly.

All the components, partially pre-assembled, are sent to a local assembly site and there they are put together in a workshop. Starting out on this scale provides users the chance to substitute components with local content over a period of time.

The workshop itself is implemented and managed by a local partner and includes basic assembly tools. Other equipment, such as a soldering machine, is provided by Solux. With the assembly room in place, a trainer/specialist will come over from Germany to train the staff chosen to assemble the solar lamp kits. After this apprenticeship, the local assembly personnel will continue to assemble solar lamps on their own.

Besides training, the transfer of kit-assembly duties to local people has a number of benefits. They include a high degree of awareness and capacity building, practical electrical training, an increased consciousness of what quality means and improved self-esteem.



Solux Assembly Workshop