

Brussels, 23 February 2015

The contribution of the Battery energy storage industry to Energy Union

EUROBAT statement on the key role of renewables for EU energy security and decarbonisation

EUROBAT¹ welcomes the renewed support expressed by the European Commission to the deployment of renewables in its Energy Union Strategy. EUROBAT agrees with the Commission that energy and climate change mitigation are fundamental challenges for our future; and that energy security, energy efficiency and decarbonisation of our energy mix should be among the main topics the Commission will work on during the next five years. We also appreciate the recognition of the fact that, if Europe wants to be the world number one in renewable energies, it must lead on storage solutions².

In the near future battery energy storage (BES) and battery services will be needed to support the deployment of renewables: now is the time to prepare the ground and remove legislative barriers to BES. **Battery energy storage is an optimum solution to store energy from on-peak renewable energy and discharge it when it is more needed** on central, decentral and off-grid situations. Moreover, **batteries can also offer grid services like voltage control and frequency regulation, maintaining grid stability and flexibility**. EUROBAT is confident that these services make BES a cost-competitive solution to integrate renewables into the grid. **Batteries can be tailored for different system requirements, and have the advantage of having high speed of deployment:** battery systems with a total of 250 MWh can be operative in 6 months. EUROBAT members would like to add their support to the deployment of renewables through technology insights and practical energy storage applications across the EU.

EUROBAT also agrees that **renewable energy sources (RES) will play a fundamental role for European energy independence and the decarbonisation of our energy mix**. Some measures and targets are already in place: the Europe 2020 Strategy aims to increase to 20% the share of renewables of EU energy consumption³, while in October 2014 EU leaders agreed to achieve a target of at least 27% share of RES by 2030⁴. Achieving these targets will require significant efforts, with clear and legally binding roadmaps at national level, and it will be absolutely fundamental to take advantage of available tools and resources to ensure a decarbonized, secure and stable energy market.

¹ The Association of European Automotive and Industrial Battery Manufacturers.

² Communication from the Commission, *A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy*, 25.2.2015 http://ec.europa.eu/priorities/energy-union/docs/energyunion_en.pdf

³ Communication from the Commission, *Europe 2020, A strategy for smart, sustainable and inclusive growth*, 3 March 2010, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF>

⁴ European Council Conclusions on 2030 Climate and Energy Policy Framework, 23.10.2014, http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ec/145356.pdf

Further background

A. The growth of renewables will face several technical challenges

The growth of the share of renewable energy in Europe has been astonishing: according to the European Commission, the share increased from 7,5% in 2000 to 14,4% in 2012, on track to achieve the 20% target foreseen for 2020⁵. We are confident that **there is still space for renewables to grow in the European energy mix**, also considering that the deployment of renewables is not distributed evenly among EU countries. In 2012, the value ranged from 0,3 to 52,4%, with only 9 countries above the 20% level⁶.

To fully deploy renewables and untap their potential to ensure a stable and secure energy supply, **Europe needs to work to overcome the limits of renewables**. Renewables are not a constant source of energy, and depend on unstable weather conditions. So far, the integration of renewables into the electricity grid has posed important challenges in terms of stability and continuous availability, and with the growth of the share of renewables these challenges will become more and more relevant.

EUROBAT, the European association representing the manufacturers of automotive and industrial batteries, fully support the efforts of the European Union towards the decarbonisation of the energy mix and the development of renewables. Our industry is an important driver for smart, sustainable and inclusive growth in Europe. It has a strong European production base, and our 47 full and associate member companies operate facilities in 29 countries in Europe, Africa and the Middle East. Over 30,000 workers are directly employed by our industry, which provides solutions of high societal importance to move to a competitive, low carbon economy able to benefit all citizens in the EU.

B. Battery Energy Storage and battery services are a key solution to foster renewables, stabilize the electricity grid and protect the environment

Batteries will facilitate the integration of renewable energies into Europe's electricity grid through energy storage in on-grid and off-grid applications, providing a back-up to intermittent renewable energy. **Battery energy storage (BES) is an optimum solution to store energy from on-peak renewable energy and discharge it when it is more needed**, overcoming RES intrinsic fluctuations such as frequency regulation in primary and secondary reserves. Indeed, batteries can maintain grid stability and flexibility, providing solutions at generation, transmission, distribution and customer levels.

Compared to other storage technologies, batteries are already available on the market to address the needs of TSOs, DSOs and customers at each level of the electricity grid. Batteries do not require complex infrastructure projects, can offer mobile and scalable solutions and can be implemented in low-risk and environmental friendly conditions.

⁵ Communication from the Commission, *Taking stock of the Europe 2020 strategy for smart, sustainable and inclusive growth*, 19.3.2013, http://ec.europa.eu/europe2020/pdf/europe2020stocktaking_en.pdf

⁶ Idem. Countries above 20% level: Sweden, Finland, Austria, Estonia, Portugal, Denmark, Romania, Lithuania, Slovenia.

All four batteries technologies – lead, lithium, nickel, sodium – can provide distinctive and important functions to grid operators and have potential for significant further technological and economic improvement.

- Lead-based batteries are robust and less sensitive to application conditions, can be connected in large battery arrangements without sophisticated management systems and have low cost per kWh.
- Lithium-based batteries are extremely versatile as they can be adapted to practically any voltage, power and energy requirement. Li-ion batteries require sophisticated control electronics, but offer precise management and state of charge control in “smart” applications.
- Nickel-based batteries serve special markets where energy must be stored in extreme climate or cycling or fast charging conditions. They can be connected in large strings without need for sophisticated management systems.
- Sodium Nickel Chloride batteries are a relatively new technology, marked by high specific energy, a constant performance and cycle life in harsh operating environments, and low maintenance requirement.

Batteries are available in various industrial relevant sizes up to large cells with high energy content. Battery energy storage is a mature technology, but there is still space for improvements: EUROBAT is confident that cell-level and systems-level research into BES will further improve the business case for BES at all levels of the grid. Support for battery energy storage R&D is thus crucial for the development of these technologies. Overall, BES can benefit the development of renewables, the grid and the environment by:

- Avoiding waste of renewable energy;
- Favoring the deployment of renewables and their growth in the energy mix;
- Stabilizing the grid, helping the EU to achieve a stable and security energy supply;
- Decarbonising the energy mix, fighting climate change.

C. Removing market and legislative barriers to Battery Energy Storage

Despite being a readily available technology, battery energy storage is nowadays seriously limited in Europe mainly due to market and legislative barriers. The EU large scale storage market lags behind its international counterparts in the US and Japan for several reasons, and the risk of dissipating the important knowledge and expertise of the European battery industry is concrete. As already stated by the European Commission itself, **“European energy storage development requires new, European rules to enable its speedy development”**⁷; the debate on the Energy Union offers a valuable opportunity to advance the deployment of battery energy storage in Europe, overcoming existing barriers:

⁷ DG ENER Working Paper, *The future role and challenges of Energy Storage*, 13.3.2013, http://ec.europa.eu/energy/sites/ener/files/energy_storage.pdf

1. **Storage strategy** – Energy storage must be seen as an integral part of the development of Europe’s Smart Grid at every level of the electrical system, from generation to consumption.

EUROBAT position: energy storage should have a central role in the European Energy Union Strategy.

2. **No EU definition for “energy storage”** – in most Member States, energy storage is defined as a regulated “generating asset”, disadvantaging it in any energy calculation and creating differences among national markets.

EUROBAT position: a consistent EU definition of “energy storage” should be established and included in network codes and relevant EU legislation. Defining energy storage as a separate asset would improve market conditions for take-up of market technologies, and should work towards enabling utilities to own and operate those technologies within their asset portfolio. This should also remove the disparities between market conditions in different Member States.

3. **Curtailement** – because power curtailment of installed capacity is possible, network operators can switch off excess power, removing the major incentive to install storage systems and wasting low carbon energy.

EUROBAT position: we recommend removing or limiting the possibility for power curtailment. This would result in less wasted energy, and would create demand for batteries and other storage technologies to store excess power and release in peak periods.

4. **Grid services** – Battery energy storage can offer several services to the grid, including voltage and frequency stabilization, which are not correctly valued by the market.

EUROBAT position: the regulatory framework should include rewards for grid services and overall capacity of energy storage to stabilize quality and supply for renewables generation.

5. **Research and Development** – on-grid battery energy storage installations are already reaching the market, but more efforts at R&D level to improve existing battery energy storage technologies are still needed.

EUROBAT position: support for battery energy storage should be maintained and reinforced in existing R&D initiatives like Horizon2020, SET-Plan, the European Grid Initiative and the European Energy Research Alliance.

6. **Battery energy storage** – Compared to other storage technologies, batteries are a mature technology already available on the market. Lead-based, Lithium-based, Nickel-based and Sodium-based batteries are well established on the European

market, and are all already capable of providing a portfolio of services to grid operators and end users.

EUROBAT position: efforts to develop a European market for energy storage should capitalise on the existing strengths of Europe's manufacturing base.

In the short and medium-term, the continued technological and economic improvement of these battery technologies should be prioritised to allow for their adaptation to the changing requirements of on-grid energy storage, and immediate integration into on-grid systems.
