

# EUROBAT

## CONTRIBUTION TO SUSTAINABLE ENERGY

### The Battery Industry and Sustainable Development

The European battery industry is committed to continuously develop and present viable technical solutions, joining its efforts to combat climate change and reduce CO<sub>2</sub> emissions in the fields of transportation and energy supply.

The strong impetus of the European Union for Sustainable Development induces challenges on major issues and industry input for the future, especially related to the reduction of greenhouse gas emissions, increased renewable energy storage, importance of security of energy supply and growing demand for hybrid and full electric vehicles.

Within that perspective, electricity is becoming a key energy carrier that requires mandatory storage systems to match the requirements for easy availability at the point of use.

The industry is committed to produce sustainable batteries in Europe for the European and world markets, in order to contribute to the objectives of the EU climate protection policy. The European Commission's "Green sustainable development strategies" have made significant changes compulsory to policies in several sectors, directly related to the battery/energy storage industry, such as:



#### Energy:

An essential need for very large reduction of CO<sub>2</sub> emissions in the long term, and therefore structure energy markets to encourage low-carbon technologies.

#### Transport:

More ambitious targets to reduce fuel consumption of vehicles, working out measures to promote environmentally friendly forms of transport.



### Batteries and Social & Employment Policies

Batteries represent, at the present time, the available solution to energy storage in a widespread number of applications, from vehicles to Renewable Energy Systems.

This is valid for a variety of industrial uses, mainly related to assuring energy supply in case of main failure (UPS, telecommunications), as well as in strategic defence applications.

For this reason, batteries are key technologies for many European strategic industrial sectors, in which social welfare and employment are very important issues.

The ability to continue or further increase research and deployment of the new technologies is highly dependent on a **strong manufacturing base for batteries in Europe**. Such a sustainable industrial base is a requirement for continued research and development efforts by companies in Europe, which in turn supports the competitiveness of much wider industry sectors with real benefits to European employees and consumers.

### Batteries and Environmental Policies

The European battery industry has fully endorsed the principles of the European environmental policy:

- Collection and recovery of all automotive & industrial batteries;
- Decreasing the environmental impact of resources use and waste;
- Optimising energy and material consumption.

The industry has proven its **excellent environmental responsibility** through the high quality of production and outstanding level of recycling of batteries and their components.

The value of materials in the end-of-life automotive and industrial batteries is sufficiently high to cover costs of collection & recycling. There is an existing European industry for batteries and metals recycling. Moreover, several battery producers are operating their own recycling facilities for the various technologies used for automotive and industrial batteries.

## Batteries and Sustainable Energy Policies

The European battery industry is committed and will contribute to solve key issues such as

- Intermittent nature of Renewable Energy Systems;
- Power quality management;
- Reserve capacity and emergency supply;
- Supply power peaks during energy time-shifts
- CO<sub>2</sub> emissions reduction

The structure of global energy supply is changing rapidly. Fossil fuels are becoming more scarce, meaning in the medium term that they will have to be replaced with renewable energies. More and more specific environmental laws are contributing to the move to “clean energy”.



The EU has set a target that in 2020, 20% of the total energy consumption should be from renewable resources. The “Green paper towards a European Strategy for the security of energy supply” emphasises the balance of energy needs and the dependency on external energy supply sources. Due to the intermittent nature of renewable energy, and to the need to adjust energy supply to energy consumption peaks, energy storage will be a fundamental key issue in the achievement of these targets and grid stability.

Batteries, as autonomous and well proved electrochemical energy storage systems, are enabling technologies for future sustainable energy systems, characterized by a higher integration of Renewable Energy Systems (RES) into grids and decentralized generation.



In the absence of a local electricity grid in developing countries, e.g. rural electrification, batteries have a key role to play in off-grid and mini-grid configurations to store the energy from RES sources and release it when needed (night time, low wind etc) for the benefit of local users, households and industry.

## Batteries for High-Performance Operations

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Logistics companies active in Europe and on the international scene (ocean freight, air freight, European road and rail traffic and contract logistics) have been using batteries since decades. Many companies change from standard batteries to high performance storage system solutions to meet the increased performance requirements and for safety and emergency issues.

Industrial safety in logistics is a key issue for the EU Battery Industry: occupation health and safety of the workers and environment, including prevention of major accidents. Batteries are used to provide electric power to systems during instances of power outages for telecommunication networks, emergency lightings, data communication and security systems.

The further electrification of the industrial trucks is a must to meet the objectives of cleaner transport and to increase the energy efficiency. Improvement of loading stations offers new batteries an increased running time and faster current delivery to enhance truck availability. Battery storage systems are recognized as a key component to optimise the power management in order to reduce fuel consumption.



## Wind and Photovoltaic Power Plant in Pulau Perhentian Island

A combined renewable energy power plant, with eolic and photovoltaic generation, has been in operation in Pulau Perhentian Island, Malaysia since 2008. The purpose of the renewable sources is to minimize the operation of the existing diesel generator sets to provide power the entire island.

- **Generation:** Photovoltaic array with max power output of 100 kW; Wind Generator 2 x 100 kW; Diesel Generator Set 2 x 200 kW, 1 x 100 kW
- **Conversion:** DC/AC bi-directional power inverter max power 90 kVA
- **Energy Storage:** European Lead-acid battery: 120 x LM 2000 cells, 2 V - 2000 Ah capacity, 480 kWh
- **Load:** Load profile: 70 kW average



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## Malaysia Remote Hybrid Generation Power Plants

Typically a power plant (Fig. 1) is structured as follows:

- **Generation:** Photovoltaic array with max power output of 10 kW; Generation Set with a power of 45 kW
- **Conversion:** DC/AC converter max power 50 kVA
- **Energy Storage:** European Lead based battery: 120 x LM 1200 cells, 2V - 1200 Ah capacity, 280 kWh (Fig.2)
- **Load:** Load profile: 5 kW with 25 kW peaks
- **System Controller:** Developed by Tanaga, the Malaysian energy provider

About thirty remote hybrid generation power plants (photovoltaic energy and generation set) have been deployed in Malaysia since 2007. The plants are located in three areas of Malaysia: the Sabah area, Palau Tinggi Island and the Peroh-Tanah Amang area.



Fig. 1 - Power Plant in Balang area

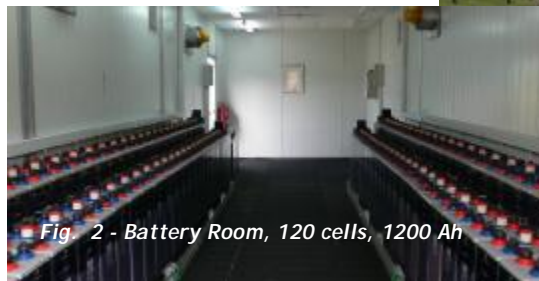


Fig. 2 - Battery Room, 120 cells, 1200 Ah

Logged data on power flows and several on-site inspections reveal that:

- The actual photovoltaic (PV) energy generation is significantly lower than expected from a standard calculation based on local irradiation data and PV cell nominal efficiency. Weather conditions (clouds, showers), actual operating temperature of the PV cells, shadowing (trees, hills) reduce the actual energy output;
- As a consequence batteries are called to deliver much more energy than expected, with two daily discharges, even though with a limited depth of discharge.

## European Batteries for Advanced PV Systems in Guadeloupe

Battery manufacturers joined forces with solar energy producers and power utility on a two year project to test the technical and economic feasibility of using li-ion battery storage with grid-connected photovoltaic (PV) systems for residential and small commercial buildings. The main objective is to enhance the efficiency of future PV solutions.

- 15 systems, 10 sites
- Start operation: April 2008
- System: PV Panels: ~2 kWp/Inverter: 2.5 kW, 150/400V /Li-ion Battery: 10 kWh, 210V/280V
- Controlled injection of 4 kWh to grid every day (During peak periods, upon utility demand)
- Simulating substitution of fuel powered generators
- Sponsored by Guadeloupe Region and ADEME



Site in Guadeloupe

The European battery industry is ready to talk to European and international agencies, institutions and governments in order to stimulate

- Innovation,
- New battery application areas,
- Renewable energy storage efficiency increase,
- Creation of more jobs in Europe.

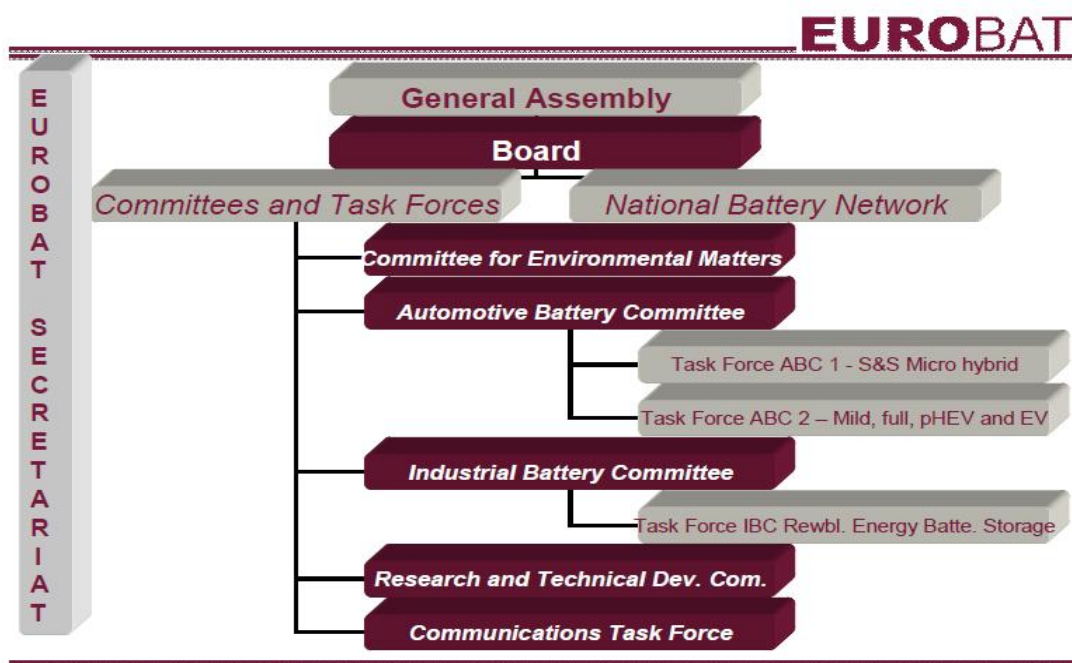
# EUROBAT

Eurobat is the Association of European Storage Battery Manufacturers and supply industry. It is the unified voice of the industry in policy discussions involving the industry, the European Institutions and national governments and:

- Works to enhance relations between the industry and the European institutions, especially the European Parliament and the European Commission;
- Develops collective solutions towards issues of common concern to the industry, the regulators and the consumers;
- Co-ordinates the exchange of information on European battery issues to the European institutions, the media and the public;
- Serves as an advisor on all information related to the automotive and industrial battery domain.

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