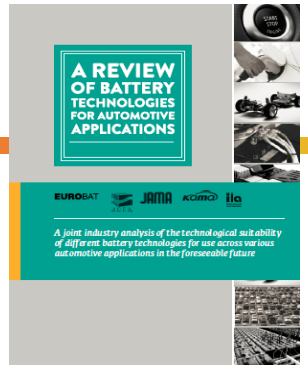
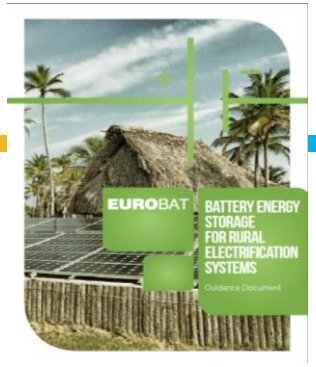
EUROBAT

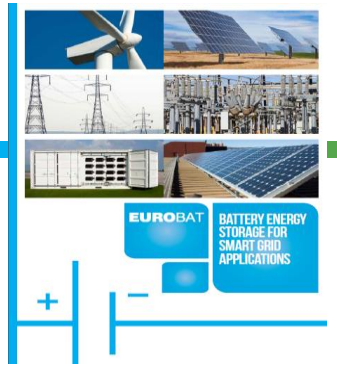
L’impatto degli accumuli sul sistema elettrico e sulla E-mobility

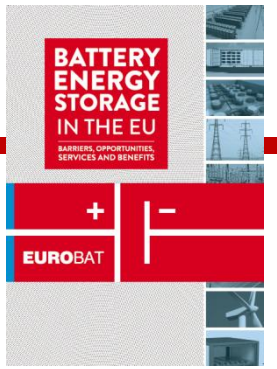
Francesco Gattiglio, EU Affairs Manager,

9 Novembre 2017

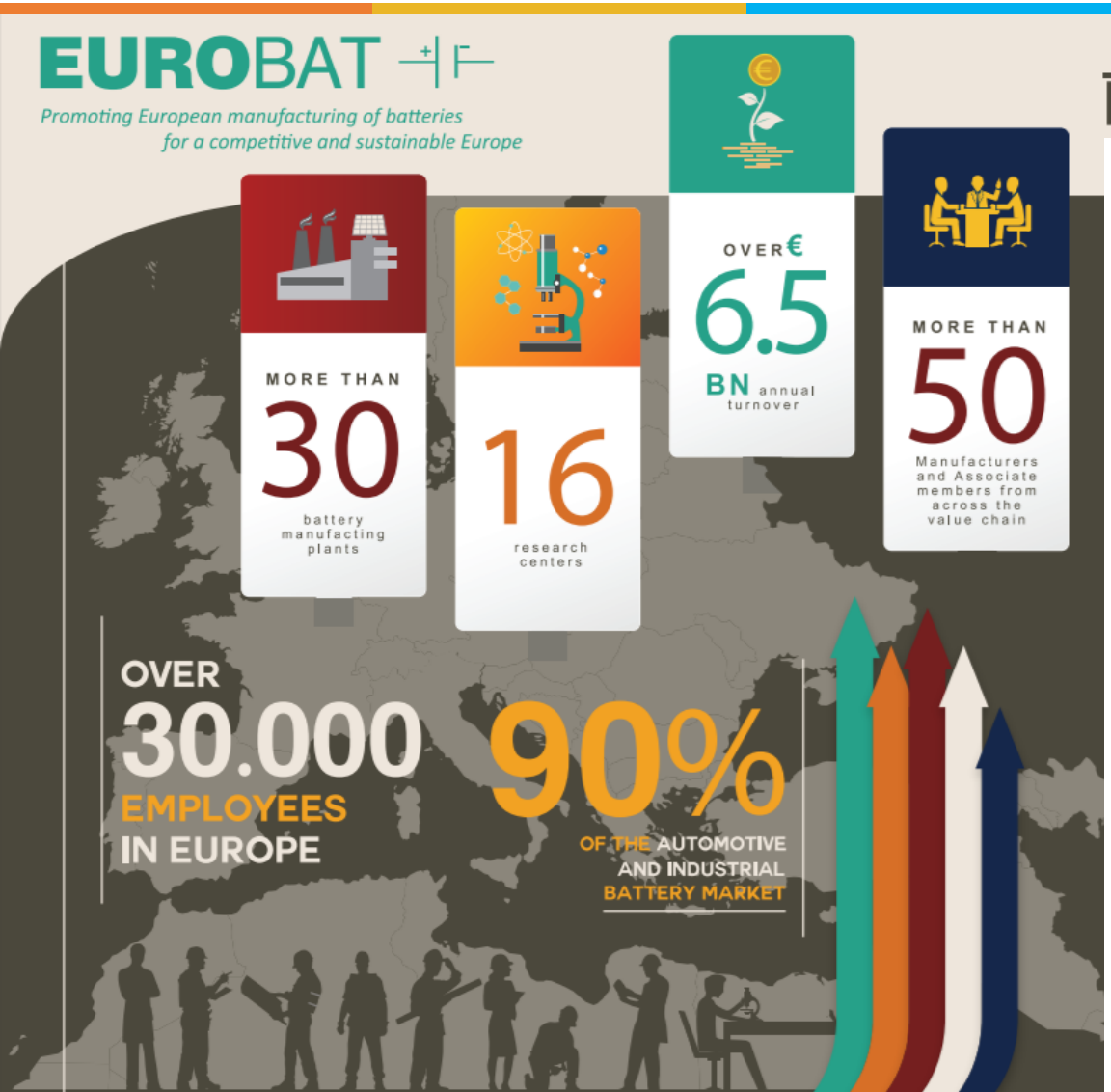


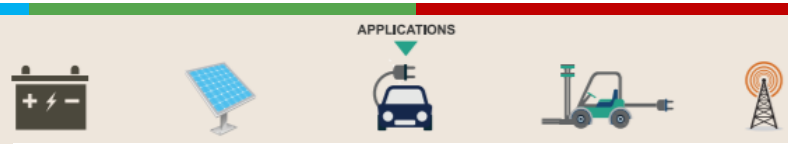






About the association and members





- **Produttori e supply chain per batterie** automotive e industriali.
- Sistemi:
  - **Piombo**
  - **Litio**
  - **Sodio**
  - **Nickel**

About the association and members

Membri dell'associazione

Value Chain

Energy storage is key for innovation – battery solutions

Wide range of applications demands variety of storage technologies!

There is no substitution for metals!

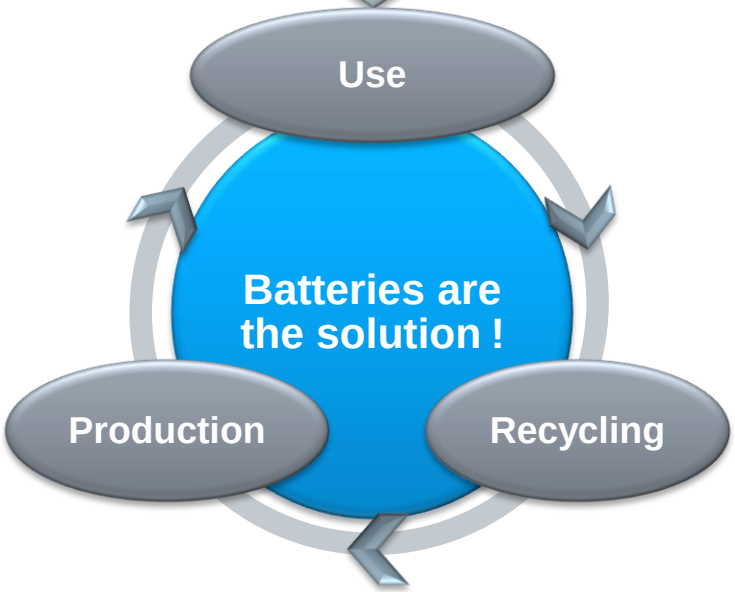

Lithium-Ion

Lead


Sodium-based


Nickel-Cadmium

- CO2 mitigation & renewable energy storage
- Resource-efficiency
- E-Mobility



Protection of the environment and human health: existing EU-regulation covers the whole live-cycle of batteries.

Leading in resource efficiency
e.g.: collection rate for lead in batteries
> 95 %, which are recycled 100% .

Overview of battery technologies

Lead batteries

- Robust and less sensitive to application conditions.
- Can be connected in large battery arrangements without sophisticated management systems.
- Low cost per kWh to install.

Lithium batteries

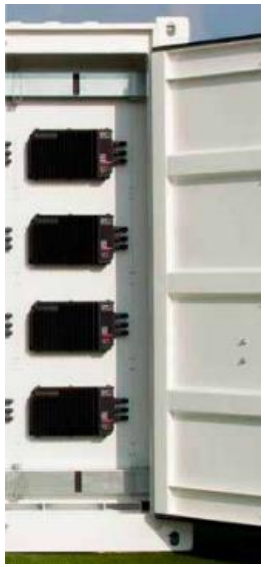
- Highly scalable, it can be adapted to practically any voltage, power and energy requirement.
- Require sophisticated control electronics, but offers precise management and state of charge control.

Nickel 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 batteries

- Originally introduced for Electric and Hybrid-Electric Vehicles.
- High specific energy, constant performance and cycle life in harsh operating environments, low maintenance requirement.



Battery Energy Storage (BES)

Generation

Transmission

Distribution

Consumption

Batteries are tailored for different system requirements, high speed of deployment: systems for 250 MWh can be operative in 6 months

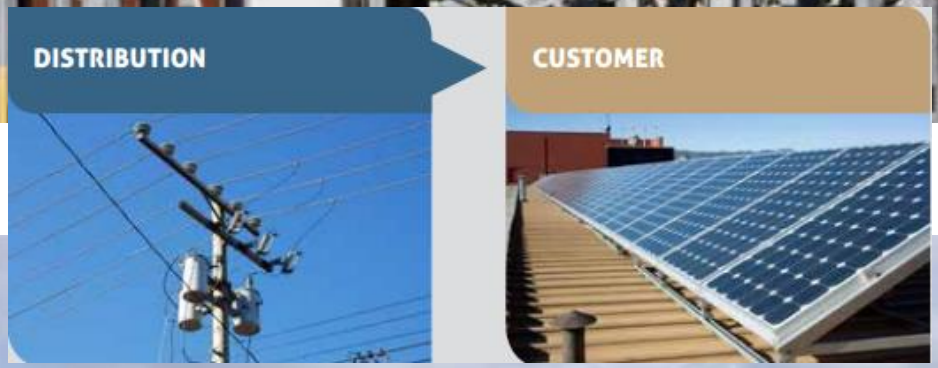
Battery Energy Storage (BES) services

Peak shaving in low voltage grid

Frequency regulation

Voltage control

Integration of renewable energy into the grid



Increase the use of renewables in the energy mix

Time-shift for self consumption

Uninterruptible power supply (UPS)

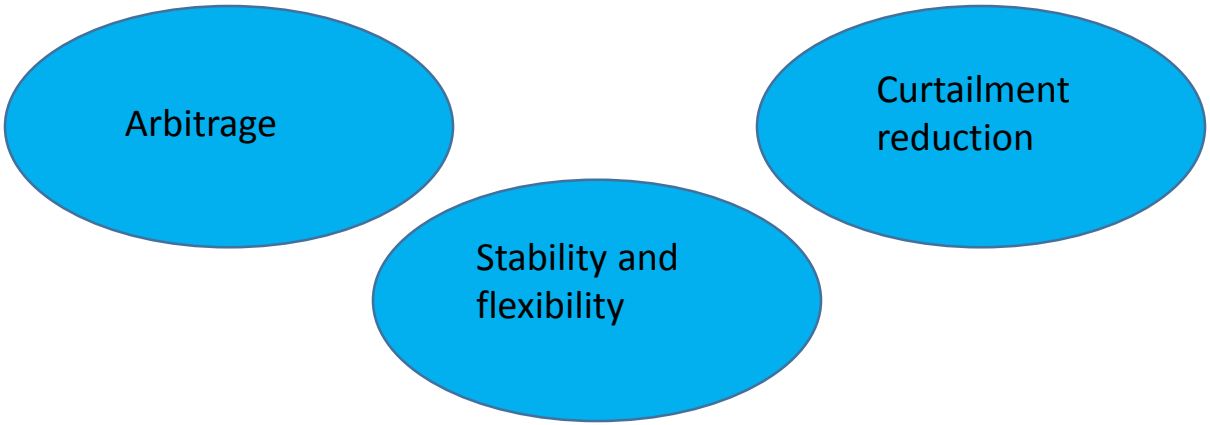
Smoothing of RES feed-in

Battery Energy Storage (BES)
Generation level

More renewables into the grid

- Storage system can be coupled with generation facilities, particularly solar and wind to reduce the impact of adverse and unpredictable weather conditions.
- Generation firms can gain greater efficiency, much-needed flexibility, stability and reduced energy waste.

Storage applications at generation level

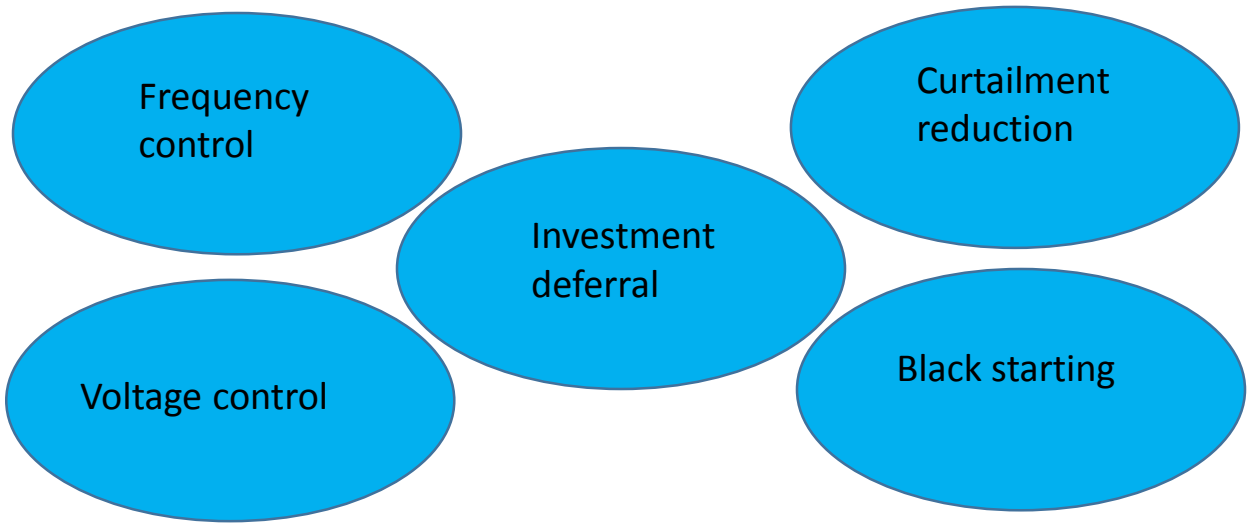


Battery Energy Storage (BES)
Transmission level

More stability and security

- Storage systems can improve the security, stability and efficiency of electricity transmission.
- Pilot project are on-going (i.e. TERNA in Italy), but legislative uncertainties on ownership must be addressed soon.

Storage applications at transmission level



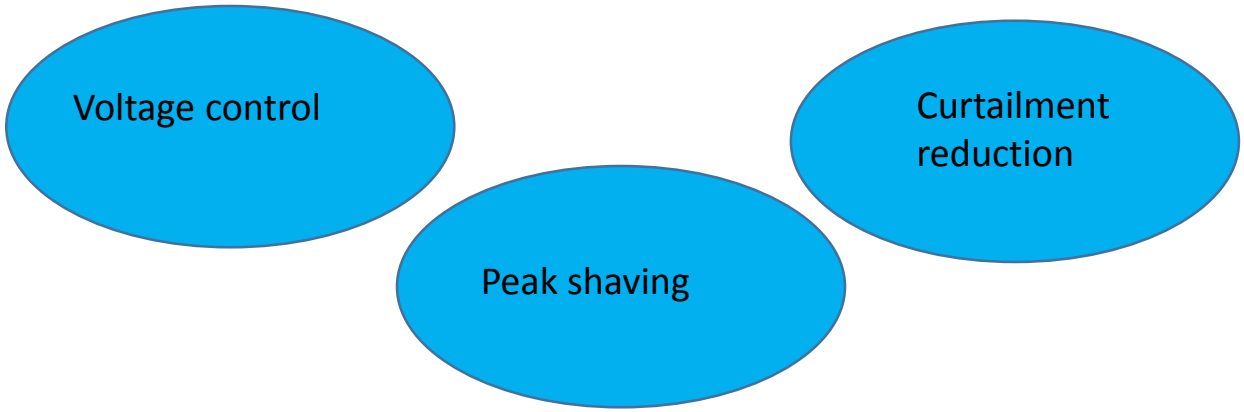
Battery Energy Storage (BES) Distribution level

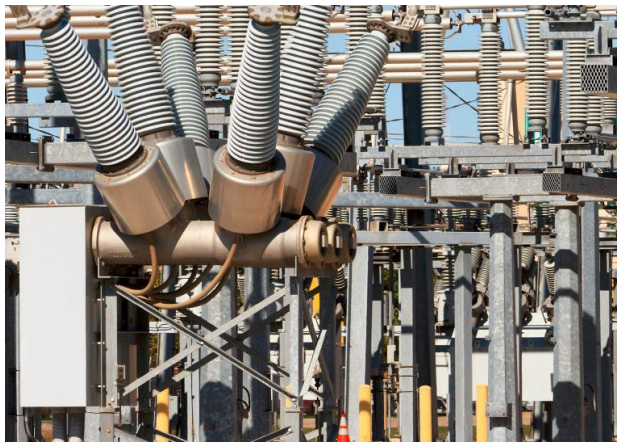
EUROBAT

Smart management of decentralised production

- Changing role of Distribution Service Operators (DSOs)
- Power will no longer only flow in one direction.
- More severe power requirements
- Continue matching supply and demand.
- Decentralised BES has dynamic behaviour with fast and powerful response times enabling for compensation of fluctuating renewable generation.

Storage applications at distribution level



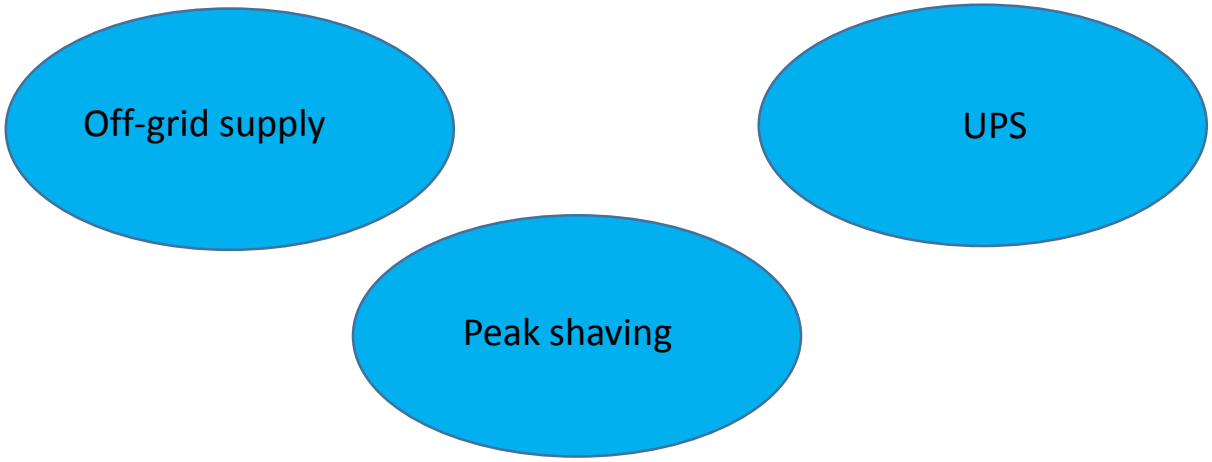


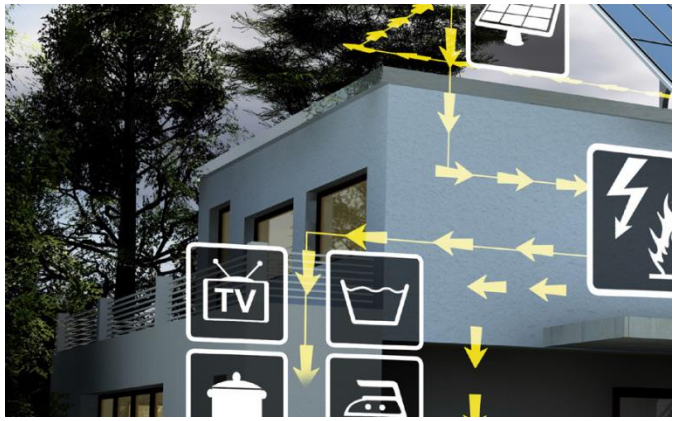
Battery Energy Storage (BES)
Consumer level

More self-consumption

- BES in homes allows users to store electricity from local generation when it is not needed and discharge it when needed.
- Increase the percentage of self-consumed electricity to around 70%.
- Customer-level BES systems have also the potential to provide active grid support.

Storage applications at consumer level

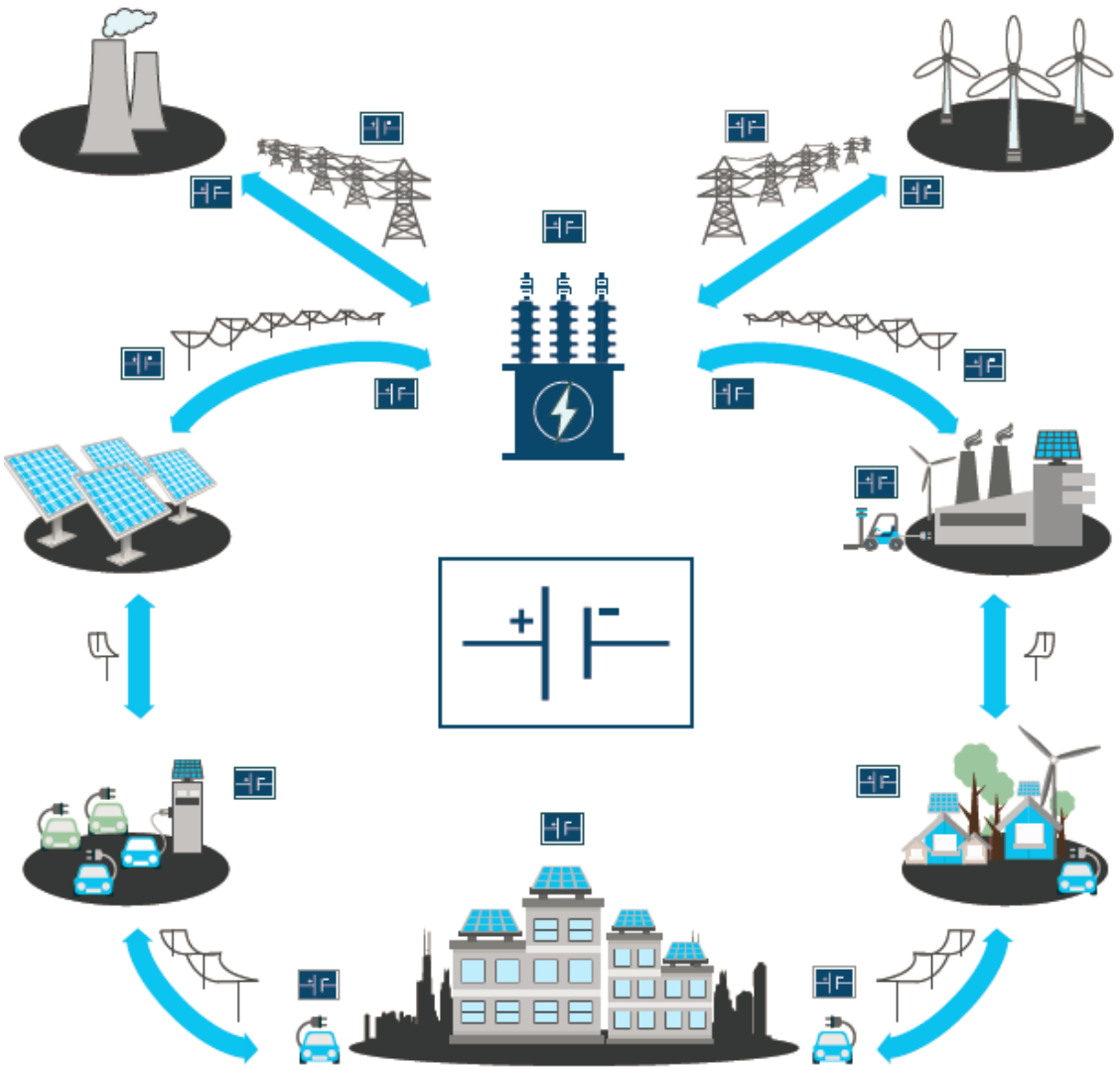




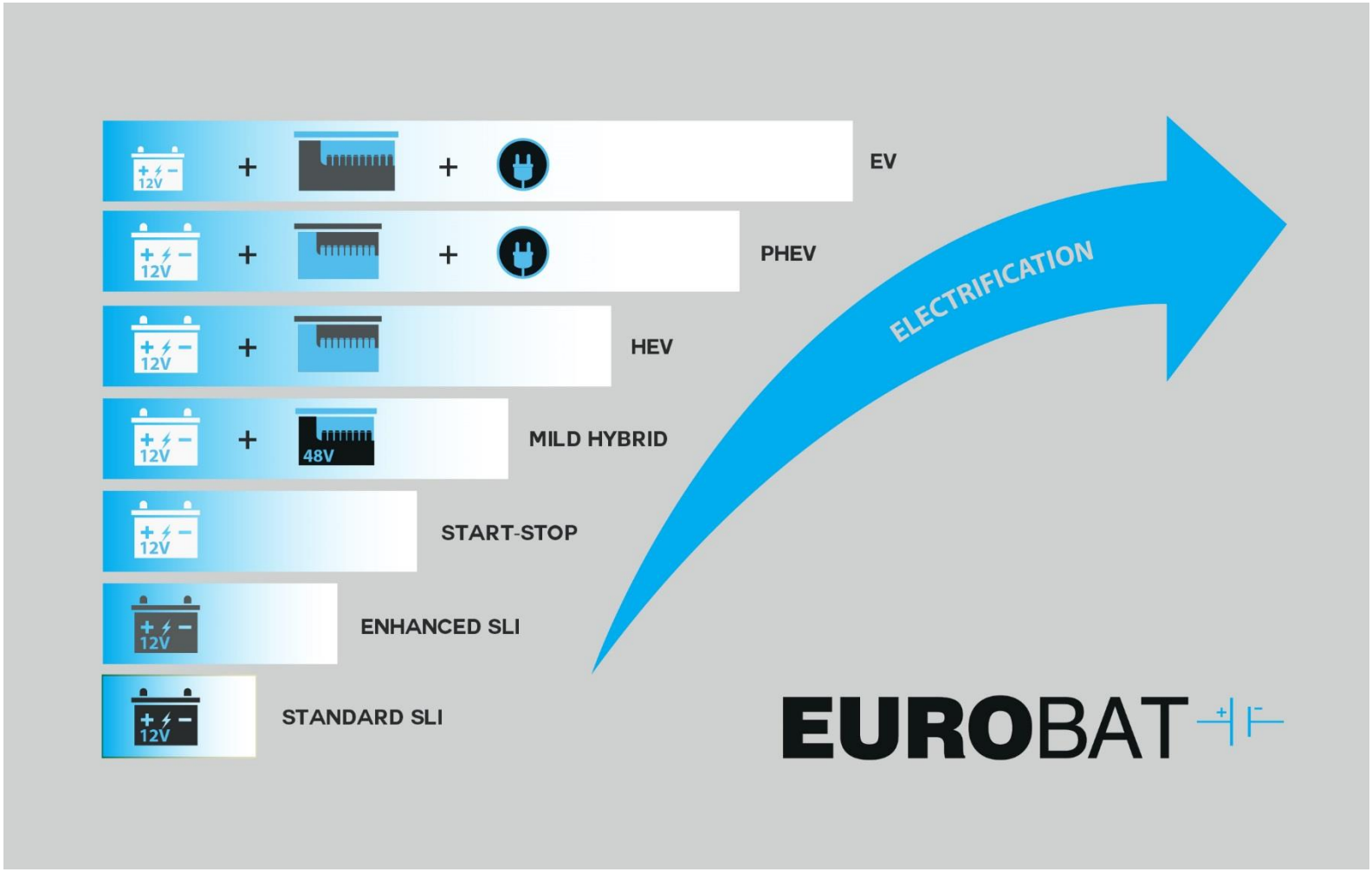
Battery energy storage

Towards a new electricity grid

- More renewables
- Active role of consumers
- Grid stability
- Fast deployment
- Open market
- Self-consumption



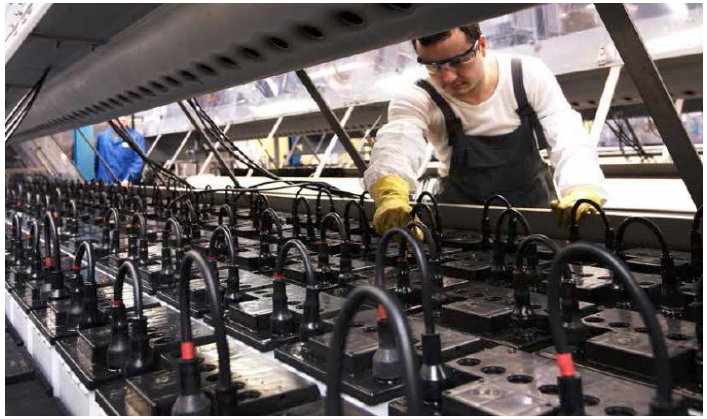
Batteries for the transport sector



Batteries for the transport sector

More stability and security

Hybridisation and electrification of transport offer several opportunities in terms of reduced emissions, energy security, job creation and economic growth, as demonstrated by several reports. Improvements of battery technology are needed to further improve performances, affordability and reliability of hybrid and full electric cars.



Vehicle and grid connection

EVs or home charging systems can help balance grid loads by "valley filling" (charging when demand is low), postponing charging and “buffer storing” (renewable energy generated by stochastic sources as solar and wind power generation), “peak shaving" (sending power back to the grid when demand is high)

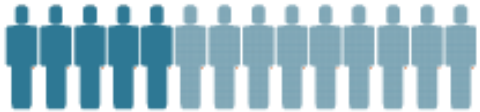
Batteries for the transport sector

(2014 *report European Climate Foundation*)

Four scenarios of future vehicle deployment were assessed against a Reference scenario:

- Current Policy Initiatives (CPI)
- Tech 1 – deployment of more efficient ICEs and hybrids
- Tech 2 – deployment of more efficient ICEs, hybrids, plug-in hybrids, battery electric and fuel cell vehicles
- Tech 3 – the majority of sales after 2030 are plug-in hybrids, battery electric and fuel cell vehicles

CPI

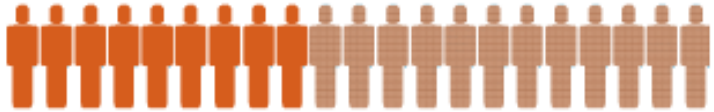


2030 = 500,800 net additional jobs
2050 = 1.39 mln net additional jobs

Tech 1

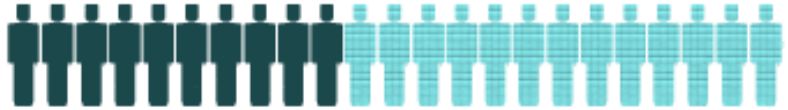
2030 = 660,000 net additional jobs
2050 = 1.95 mln net additional jobs

Tech 2



2030 = 850,000 net additional jobs
2050 = 2.14 mln net additional jobs

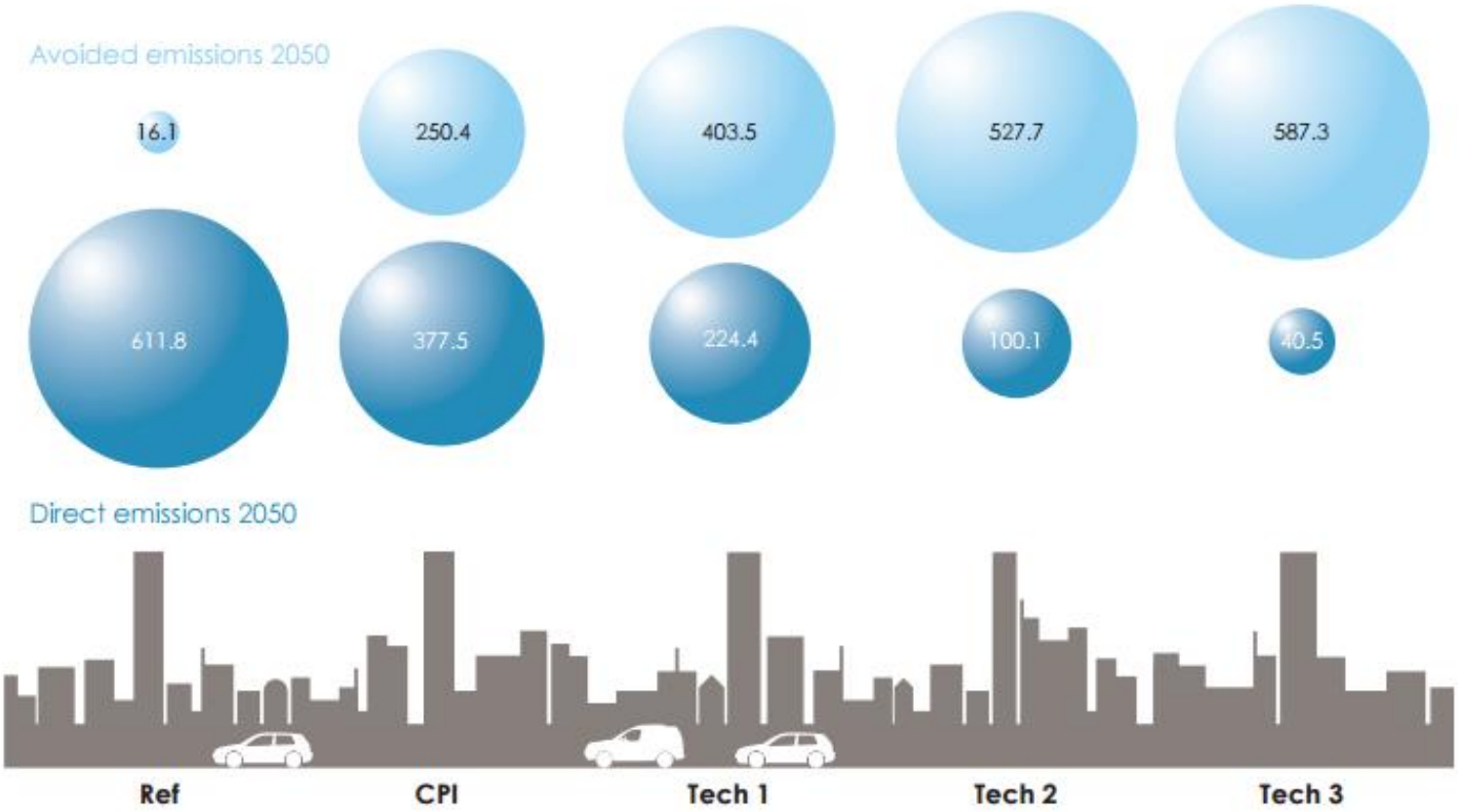
Tech 3



2030 = 1.10 mln net additional jobs
2050 = 2.35 mln net additional jobs

Batteries for the transport sector

Benefits of shifting to low-carbon vehicles by 2050 in the EU :
decarbonisation potential



Batteries for the transport sector

- The EUROBAT e-mobility Roadmap looks forward to 2030 and identifies 6 R&D priority areas where improvements are mostly needed:
  - **Performances**
  - **Cost**
  - **System integration**
  - **Production process**
  - **Safety**
  - **Recycling**
- Specific recommendations to progress in these areas are identified for each battery technology.
- The Roadmap focuses on three battery technologies which we predict will have the greatest potential for further technological improvements:
  1. **Advanced lead-based batteries**
  2. **Lithium-ion based batteries**
  3. **Sodium based batteries**
- In 2014, EUROBAT published “A review of Battery Technologies for Automotive Applications”, presented during last year Eurobat Forum.
- The two documents together give a comprehensive picture of battery technologies for all vehicle applications, now and in the future.

Initiatives at EU level

TRANSPORT	RESEARCH	ENERGY	SUSTAINABILITY
MOBILITY PACKAGE – 8 NOV 2017	SET PLAN	CLEAN ENERGY PACKAGE	ELV/REACH/ BATTERIES DIRECTIVE
CO2 TARGETS	TWG 7 ON BATTERIES: RESEARCH PRIORITIES + TARGETS	RULES ON STORAGE	
INDUSTRY-LED INITIATIVE ON BATTERY MANUFACTURING			

11 OCTOBER – SEFCOVIC HIGH LEVEL MEETING ON BATTERIES

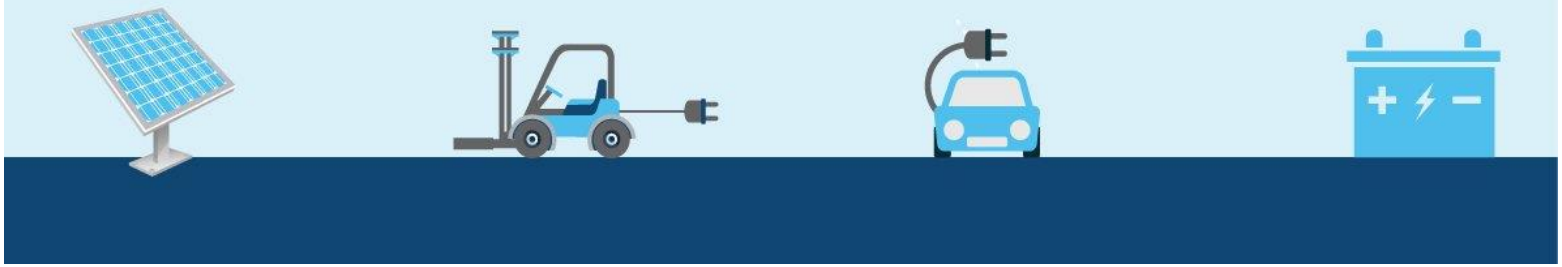
Battery Strategy

#EUBatteryStrategy

EUROBAT

ASSOCIATION OF EUROPEAN AUTOMOTIVE AND INDUSTRIAL BATTERY MANUFACTURERS

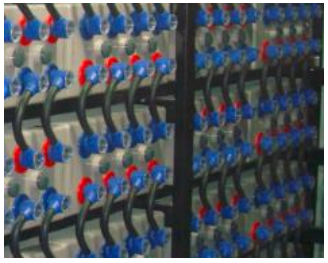
EUROPE NEEDS A 2030 BATTERY STRATEGY TO BOOST COMPETITIVENESS, JOBS AND GROWTH AND DECARBONISE ITS ECONOMY



EUROBAT Standpoint

- ✓ Keeping and expanding the manufacturing base of all battery technologies in Europe
- ✓ All battery technologies are relevant for jobs and growth
- ✓ Policy coherence (energy – transport – environment) needed
- ✓ Business certainty: stewardship in Battery Directive and REACH regulations
- ✓ Forward-looking strategy to boost competitiveness

LEAD



LITHIUM

NICKEL

SODIUM

Towards a European Battery Alliance

- 11 October: 40 participants, companies working on raw materials/mining, materials, cells, battery systems, OEMs, energy, R&D, financial institutions, member states.

- Focus on e-mobility, but also energy storage is part of the picture.

- Battery production is a key enabling technology for the energy transition, from the electrification of transports to energy storage.
  - Europe needs to invest in li-ion battery cells production to compete with Asia on both e-mobility and energy storage.
  - EU leadership in many sectors of the battery value chain, from materials to system integration and recycling.
  - Work streams until December, presentation of the plan for the battery alliance in February.


LE FIGARO.fr

Économie › Flash Eco

Ghosn soutient l'idée d'un "Airbus des batteries"

Par Le Figaro.fr avec AFP | Mis à jour le 06/10/2017 à 16:33 / Publié le 06/10/2017 à 16:23

17 commentaires

Le PDG de Renault a soutenu vendredi l'idée de la Commission européenne de former un "Airbus des batteries" pour les voitures électriques face à la concurrence asiatique, mais a exclu de participer à un tel consortium. "Est-ce qu'il faut faire des batteries en Europe ? Je pense que oui. Pourquoi ? L'industrie automobile est une industrie très importante pour l'Europe", a développé Carlos Ghosn lors d'une conférence de presse au sujet du nouveau plan stratégique de son entreprise, en particulier axé sur le développement de modèles électriques.


FINANCIAL TIMES

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Batteries + Add to myFT

Brussels wants Airbus-style consortium to lead battery revolution

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"Batteriegipfel" in Brüssel

Autoindustrie startet Aufholjagd

Der Markt für Batteriezellen für E-Autos wird von asiatischen Herstellern dominiert. Um den Anschluss nicht zu verlieren, will die europäische Industrie zusammen mit der Politik eine Strategie entwickeln.


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HOME MACROECONOMIA FINANZA LAVORO DIRITTI E CONSUMI AFFARI&FINANZA OSSERVA ITALI

Auto elettrica, la Ue vuole la creazione dell'Airbus delle batterie

Il commissario Sefcovic convoca a Bruxelles i principali gruppi chimici, automotive e hi-tech per dar vita a un consorzio sul modello del settore aeronautico. Nel campo dell'energia, Terna potrebbe essere il leader europeo per i sistemi di accumulo destinati alle rinnovabili

Mobility Package

First part: 31 May 2017

- Industry-led initiative on Battery manufacturing
  - Need to identify strength and weaknesses of EU battery industry
  - Which part of the value chain?
  - Lithium or post-lithium?

Second part: 8 November 2017

- New CO2 targets for the post-2020 period
  - By 2021, phased in from 2020, the fleet average to be achieved by all new cars is **95 grams** of CO_2 per kilometre, with WLTP test.
  - **CO2 targets for post-2020:** 68g/km to 78g/km
  - CO2 targets for HDV (Q1 2018)
  - **Alternative fuel vehicles**:
    - Present regulation: additional incentives to produce vehicles with extremely low emissions (**below 50g/km**).
    - Possible inclusion of a Zero-emissions vehicles (ZEV) mandate: out of total sales, OEMs will have to sell a certain quota of ZEVs (plug-in hibrid, full electric or fuel cell).

Clean Energy Package (30 November 2017)

New proposals on:

- Revised electricity Regulation
- Revised electricity Directive
- Revised renewable energy Directive
- Revised energy efficiency Directive
- Revised energy performance of buildings Directive
- Regulation on the Governance of the Energy Union
- Regulation on risk preparedness in the electricity sector
- Revised regulation on a European Agency for the Cooperation of Energy Regulators (ACER)

June 2017 Karins report → 15 Sep Amendments → 11 Dec Vote ITRE

New rules for energy storage

- Definition of energy storage
- Ownership rights: DSOs/TSO shall not be allowed to own and operate storage systems
- Right for final customers to generate, store, consume and sell self-generated electricity
- Role of aggregators
- Public tendering for ancillary services open to all market participants (>500kW until 2026, then >250kW)
- Balancing responsibilities for all market participants
- Electricity prices reflecting actual demand and supply
- Transparent real time price signals

Conclusions

- Batteries are **key to decarbonise the European energy mix and its transport sector,** and improve citizen's health and the environment.
- Batteries are **key to decarbonise the European energy mix and its transport sector,** and improve citizen's health and the environment.
- **Renewable energy can grow** further through storage.
- Manufacturing in Europe is stimulating both **direct job numbers as well as in R&D,** universities and installation.
- Policy initiatives at EU level should ensure a level playing field, **policy coherence and business certainty**

EUROBAT

- Thank You -

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