



# **EBA@250, the EIT InnoEnergy workstream within the EU Battery Alliance**

# EU Battery Alliance, the background

## Europas batteristrategi formas i Stockholm

**NyTeknik** 2017-07-21 11:00 Johan Kristensson



Kenneth Johansson, vd InnoEnergy Scandinavia, Foto: Johan Kristensson.

- InnoEnergy presented to Brussels decision-makers the NorthVolt project, aiming at building a fully European Gigafactory in the EU
- During these discussions, the European Commission took note of the expertise that InnoEnergy has developed on batteries and storage at large (for mobility and stationary applications) and that InnoEnergy had a lot of assets in that sector (21 in its portfolio, addition of Innovation Projects and start-ups).

INSIGHT\_E Reports Nov 2014 and Dec 2015

InnoEnergy's assets in storage (projects and startups)

**INSIGHT\_E**  
An energy think tank informing the European Commission

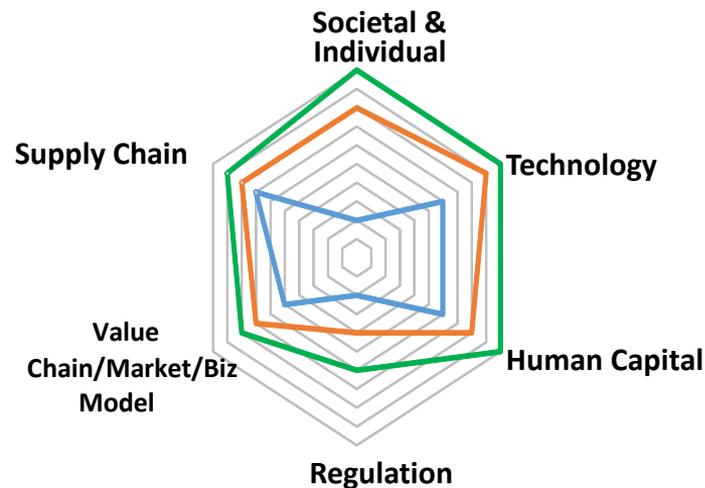
**How can batteries support the EU electricity network? Business models for flexible production and storage**

**Lead Author:** [Blank]  
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**Reviewers:** [Blank]

**Lead Authors:** Abhishek Shivakumar (KTH); Paul Deane (University College Cork); Bo Norrmark (KIC InnoEnergy); Aurélie Faure (Efr);  
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**Reviewer:** Rocco De Miglio (E4SMA)

Applications, market segments	Carriers				
	Electrical	Electro-chemical	Thermal	Chemical	Mechanical
Grid storage	Arbitrage Capacity guarantee Ancillary services Grid support Consumer services	UGREEN C2c New Cap	Elvation Northvolt Electro		Hyube Minerve Hymes
Home storage bulkhead the meter	Arbitrage Capacity guarantee Ancillary services Grid support Consumer services	UGREEN C2c New Cap NUNA	E-BUS Battery Penib Northvolt Electro Lancey ES MacCell Sylfar	Esout Eneltech	Hyube
Off-grid	Household Commercial MicroGrids	UGREEN C2c New Cap	E-BUS Battery Penib Northvolt Lancey ES Wattson	Eco-Tech Ceram Esout Eneltech	Cofast Hyube
Transport		UGREEN C2c New Cap NUNA	E-BUS Battery Penib Northvolt Tale MacCell NUNA		Cofast Hyube Fluerty
Consumer goods		UGREEN C2c New Cap NUNA	Northvolt		

## What needs to be done to make Europe a winner in batteries ?



# First High-Level Workshop September 14, 2017

www.innoenergy.com

**SUBJECT:**  
INVITATION > High-level workshop: Can Europe be a global leader on batteries? > 14 September, 9:00-18:00



European Political  
Strategy Centre

Dear Colleague,

On behalf of the European Political Strategy Centre (EPSC), the European Commission's in-house think tank, and InnoEnergy, the European Public-Private Partnership dedicated to innovation in energy, we have the great pleasure of inviting you to a **high-level workshop** on:

## Can Europe be a global leader on batteries?

The event will take place on **Thursday 14 September 2017**, from **9h00 to 18h00** in the European Commission's headquarters (**Berlaimont building**, Rue de la Loi 200, 1049 Brussels, **room 12/040**).

The meeting convenes as the European Commission prepares the second wave of its 'Mobility package' proposals – foreseen for the end of this year – and ahead of a high-level meeting on 'Battery development and production in Europe' which will be organised under the auspices of Vice-President Seifcovič on 11 October 2017.

- Does the EU really need to develop a complete battery value chain, and if yes, what measures are required?
- How can the EU best support the creation of a winning European battery ecosystem? What strategic measures are needed in the fields of research and innovation, industrial supply chain, regulation, education and training, societal appropriation and other areas?

We would be grateful if you could **confirm your participation by email** to Bo Normark ([bo.normark@innoenergy.com](mailto:bo.normark@innoenergy.com)) at your earliest convenience and no later than **Friday, 8 September 2017**. Please note that **this invitation is personal and non-transferrable**.

We very much hope to have the pleasure of welcoming you to this timely exchange.

Best wishes,

Ann Mettler

**ANN METTLER**  
Head, European Political Strategy Centre



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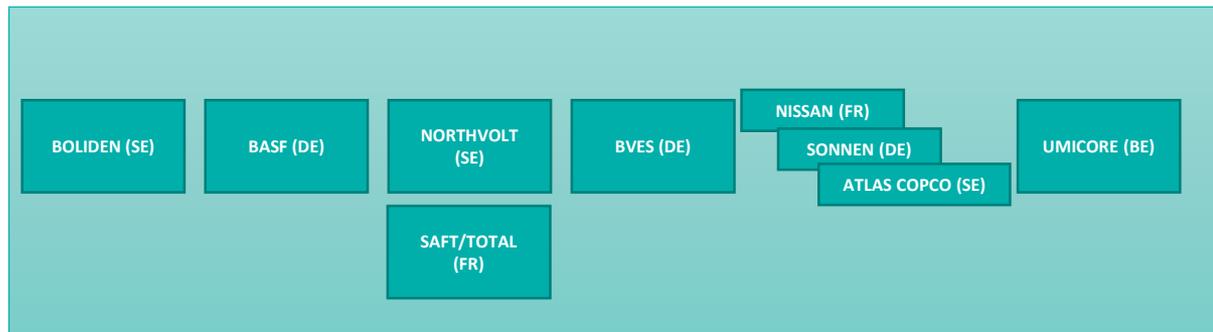
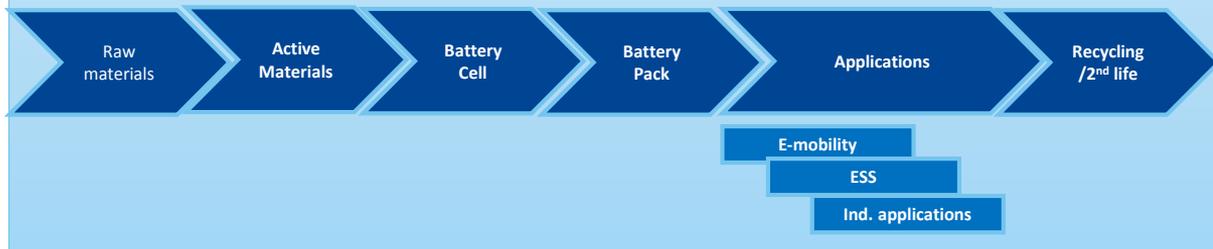
Diego Pavia

**DIEGO PAVIA**  
Chief Executive Officer



InnoEnergy

## Value chain approach



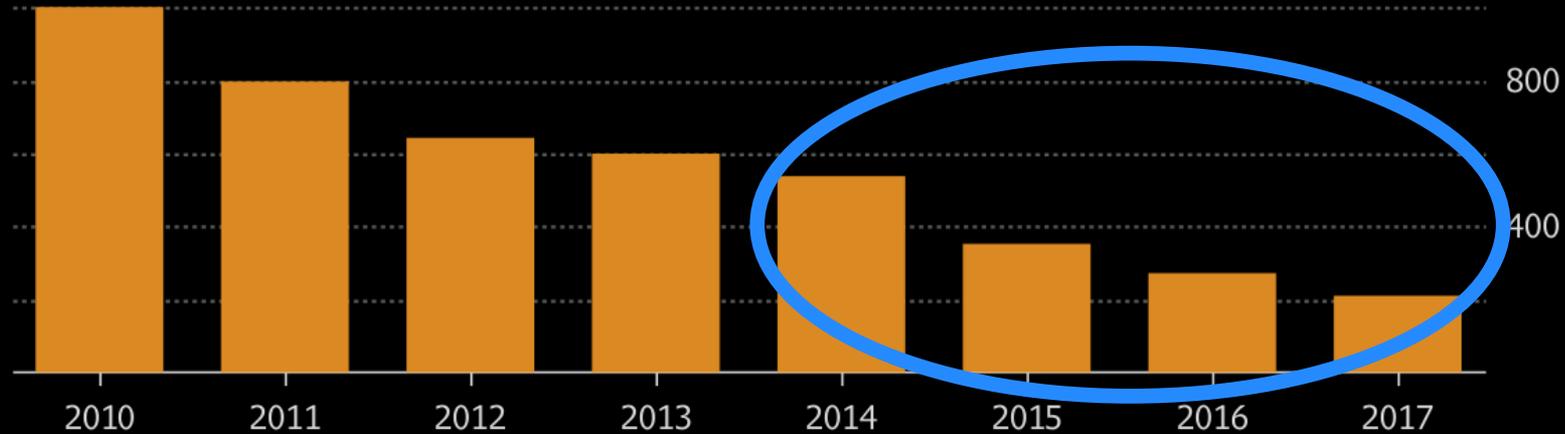
# Dramatic price drop in batteries drives market

From 550 \$ / kWh to 209 \$ / kWh ( - 62 % )

## Cheaper Batteries

Lithium-ion battery prices just keep falling. They're down 24% from 2016 levels.

\$1,200 U.S. dollars a kilowatt-hour

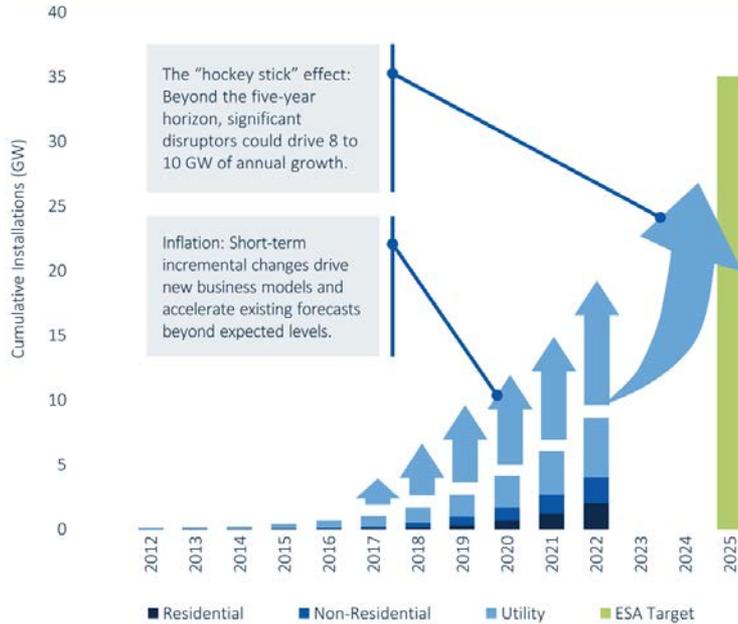


Note: Figures are volume-weighted averages

Source: Bloomberg New Energy Finance survey of more than 50 companies

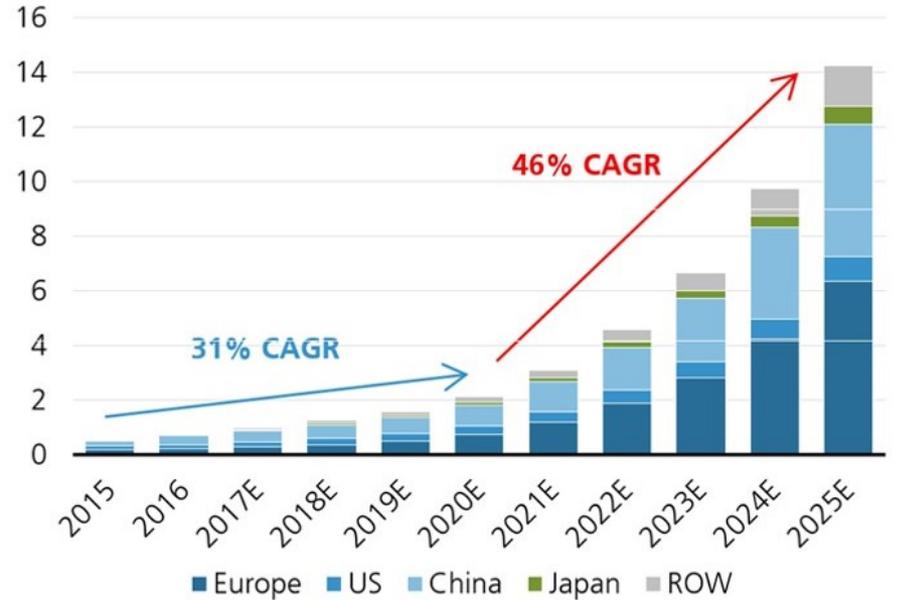
# Tipping point in battery market around 2020

GTM Research Total Cumulative 5-Year Forecast



Source: GTM Research

Figure 22: EV sales by region (m units)



Source: UBS estimates

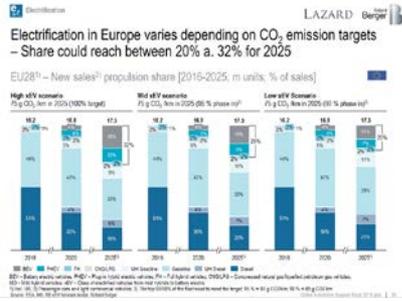
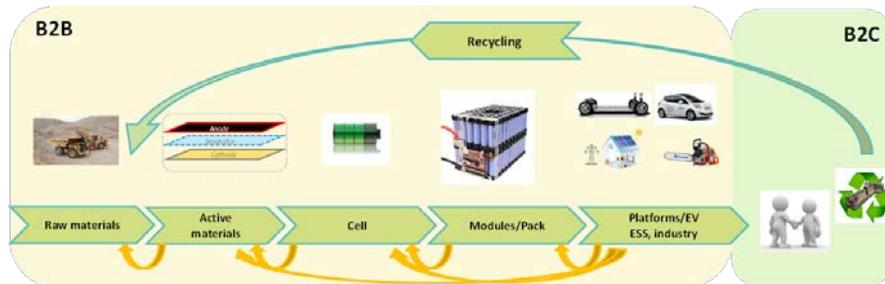
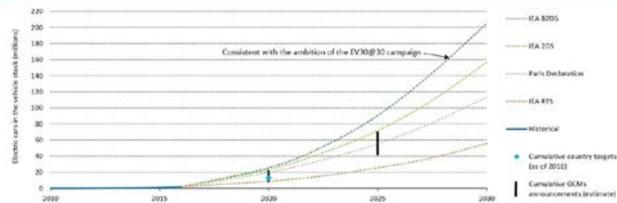


Figure 2 • Deployment scenarios for the stock of electric cars to 2030



**EBA@250**



**Matthias Machnig**, German State Secretary, Federal Ministry for Economic Affairs and Energy

**Brune Poirson**, French Minister of State, attached to the Ministre d'Etat, Minister for the Ecological and Inclusive Transition

**Jadwiga Emilewicz**, Polish Deputy Minister of Economic Development

**Maroš Šefčovič**, European Commission Vice-President in charge of the Energy Union.

“The lack of a domestic, European cell manufacturing base jeopardises the position of EU industrial customers because of the security of the supply chain, increased costs due to transportation, time delays, weaker quality control or limitations on the design”, the Commission Vice-President said.

“So, we need to act fast – and collectively – to overcome this competitive disadvantage and capitalise on our leadership in many sectors of the battery value chain, from materials to system integration and recycling.”

## Policy-makers cannot predict the future, but we can greatly influence it. We can create the best conditions for a battery value chain to develop in Europe.

  
European Commission

MAROŠ ŠEFČOVIČ  
Vice-President of the European Commission

Brussels, 26/10/2017  
Ares (2017) 25259

**HIGH LEVEL MEETING ON EU BATTERY PRODUCTION – FOLLOW UP**

Dear Mr Carlsson,

Let me first thank you for your participation in the EU Battery Summit that was held on 11 October in Brussels. I very much appreciated your valuable contribution to this strategic initiative and the launch of an EU Battery Alliance as a result.

I clearly heard from the actors present that the EU needs to take a decisive step towards establishing a competitive battery value chain with large-scale cell production at its core, together with the forceful commitment from private and public stakeholders to work together.

While support from the Commission, the European Investment Bank (EIB) and some Member States is key, the **lead needs to stay with the Industry**. It will be up to you to discuss and elaborate the kind of cooperation(s) you find suitable for putting the Alliance in place.

Moreover, this Alliance cannot be developed in silos. To create a pan-European and cross-sectoral batteries ecosystem, capable of converting our technological leadership into competitive high-performing and customer differentiated products and services, we need to address some of the challenges you mentioned, such as: the lead time needed from decision to market, improve innovation deployment to increase EU batteries' competitive edge (for materials, chemistries, manufacturing processes and management systems), the skills gaps, increased efficiency and security in the supply and use of raw materials, sustainability of batteries manufacturing, EU's recycling / second life potential, standardisation, IP and trade related barriers and citizens' awareness.

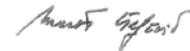
It will also be up to industrial and innovation actors to propose a joined-up strategy, covering the whole value chain, and including some strategic recommendations or way forward in these key areas. This strategy should be presented and discussed in February 2018, upon the Clean Energy Industrial Forum, which will take place as part of the EU Industry Day.

In parallel, I have notably asked Innoenergy, the Knowledge and Innovation Community set up by the European Institute of Innovation and Technology (EIT), to continue its ground work in partnership with EU industry, academia, financial sectors, with a view to delivering first recommendations on enabling framework conditions by the end of 2017. This will be done in

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revolution and of our EU jobs, growth and investment agenda.

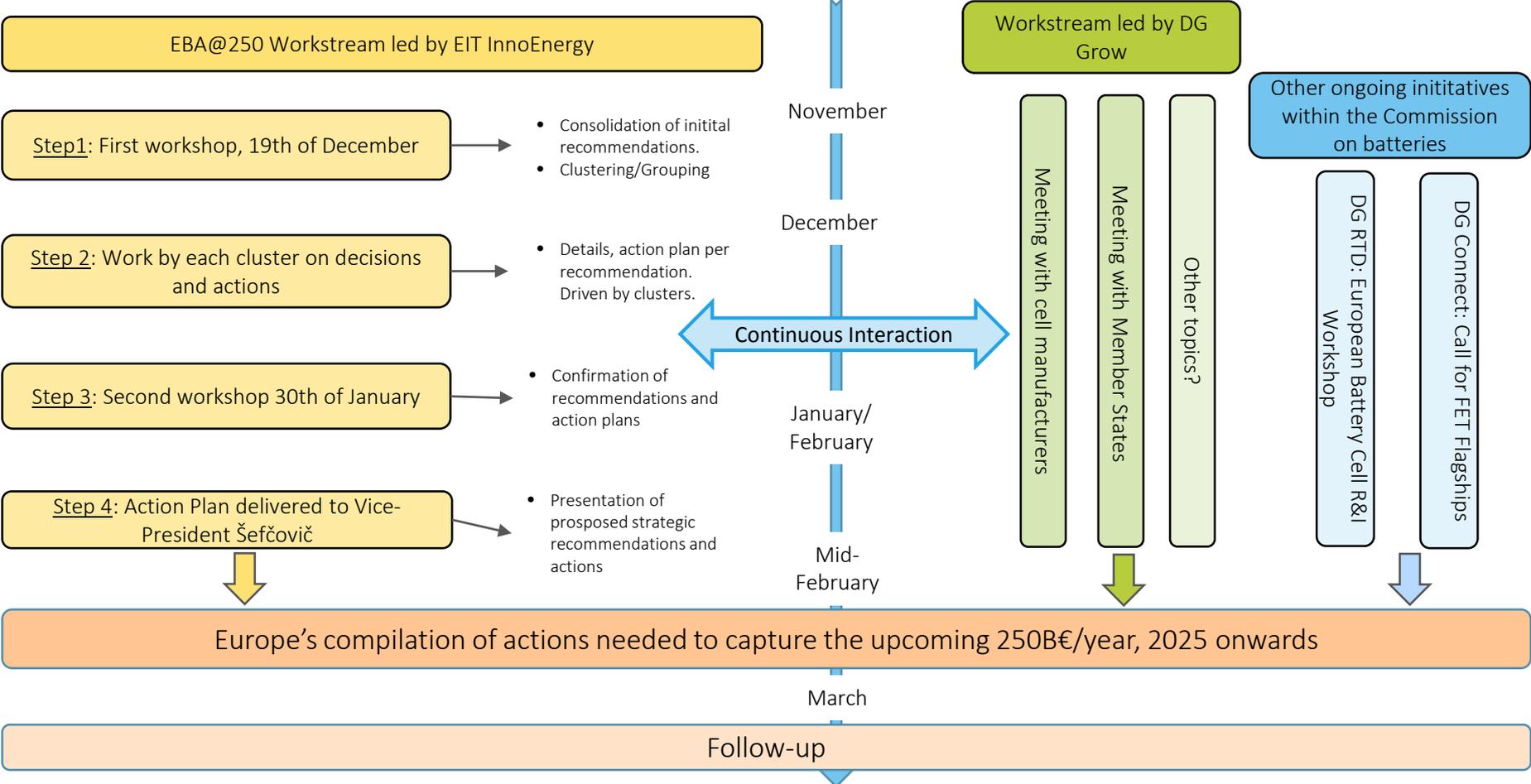
Yours Sincerely,



- **Providing background data**
- **Establishing a meeting place for Key Industrial Players along the entire value chain**
- **Support establishment of an European Battery eco-system**
- **Collect and formulate key questions, recommendations and actions**

# **EBA@250, the EIT InnoEnergy workstream within the EU Battery Alliance- Design Phase**

# Schematic relation between the European Battery Alliance streams



# First EBA@250 meeting, December 2017 with stakeholders capturing the entire value value chain

Raw materials

Active Materials

Battery Cell

Battery Pack

Applications

Recycling/2<sup>nd</sup> life

E-mobility

ESS

Ind. applications

EIT Raw Materials

Nanomakers

Litarion GmbH

Blue Solutions

VOLKSWAGEN

ENEL

UMICORE

Leading Edge Materials

BASF

Varta

Continental

RENAULT

EDF

SOLVAY

Outotec

Arkema

Leclanché

LION E-Mobility

Jaguar-Landrover

EBRA

Eramet

NXP Semiconductors

EAS Batteries

BMW

Atlas Copco

SGL Carbon SE

Terra E

Peugeot-Citroën

Manz

Liacon

NISSAN (FR)

Elring-Klinger

Northvolt

VOLVO

CustomCells

Research and associations active in all parts of the value chain

Fraunhofer

CEA

T&E (Transport and Environment)

EASE

EUROBAT

EMIRI

# Second meeting Jan 2018 – “every-one”

www.innoenergy.com

Raw materials

Active Materials

Batteries and Battery Packs

Applications

Recycling/2<sup>nd</sup> life

**100 + stakeholders across ALL the value and supply chain**  
**Legitimizing the outputs**

E-mobility

ESS

Ind. applications

EIT Raw Materials

Nanomakers

Litairon GmbH

Akasol

VOLKSWAGEN

ENEL

Umicore

Leading Edge Materials

Blue Solutions (Bolloré)

Saft

E4V

FIAT

TERNA

Veolia

Outotec

BASF

Varta

Continental

RENAULT

EDF

Solvay

EUROMINES

Arkema

Leclanché

LION E-Mobility

Jaguar-Landrover

cyberGRID GmbH

EBRA

Eramet

NXP Semiconductors

EAS Batteries

BMZ -  
Batteriemontagezentrum

BMW

Atlas Copco

SUEZ

Boliden

SGL Carbon SE

Terra E

Sonnen GmbH

PSA Groupe

Manz

Terrafame

BELENOS

Liacon

EoCell Inc

NISSAN (FR)

Elring-Klinger

Rio Tinto

CEFC

Northvolt

HE3DA

VOLVO

Stihl

Magnis /Allocate

Heraeus

CustomCells

Daimler

Vattenfall

Nanomakers

KLIB

Husqvarna

Total

Research and associations  
active in all parts of the  
value chain

Fraunhofer

CEA

ENEA

T&E (Transport  
and Environment)

EASE

EUROBAT

EMIRI

ANIE

Ångström Advanced  
Battery Centre

E4V

RECHARGE

Akkurate OY

CEPS

SET Plan TWG 7



# Examples of concrete actions along the Value Chain

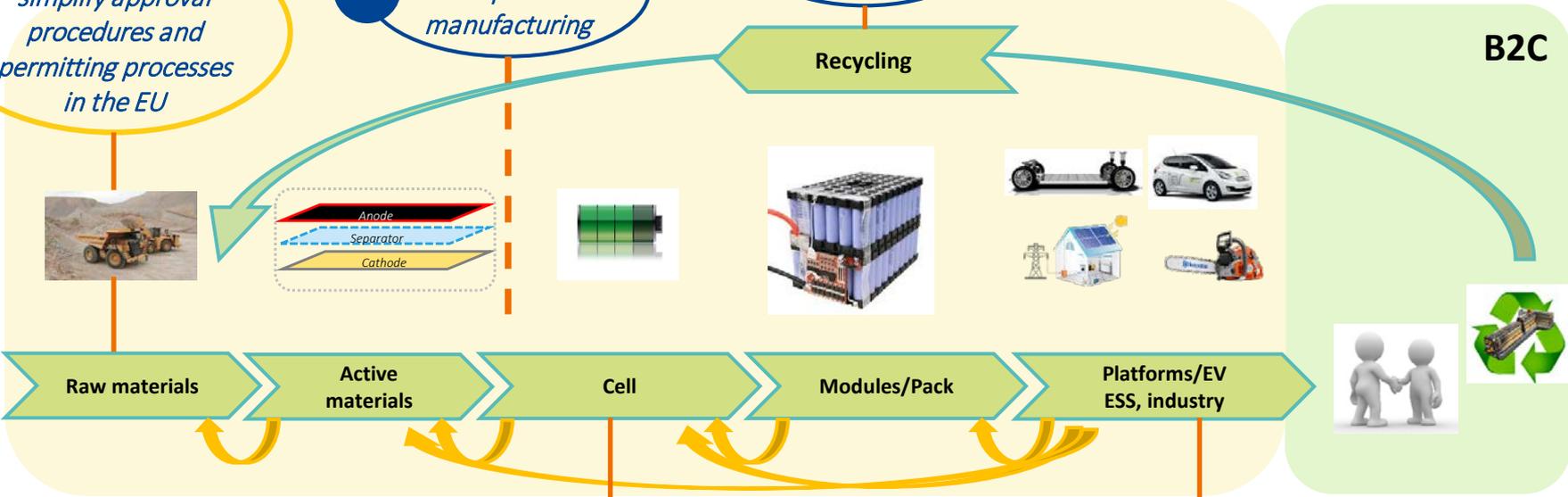
Europe can capture a new market worth 250B€/year in 2025 ....  
 .... if we act quickly ..... with a value chain approach

Standardise and simplify approval procedures and permitting processes in the EU

Reducing carbon footprint in manufacturing

Demo projects for recycling and 2<sup>nd</sup> life

EU Label for batteries



● EU/MS  
 ● Industry

De-risking measures for EU cells manufacturing

Define & implement a consistent incentivizing framework for uptake of the EV market

# Action 9a and 9b: Targets for charging infrastructure and framework for the development of the EV market

## Build the market by:

- Creating infrastructure that supports electrification. Make it easy to own an electric vehicle
- Incentivize the purchase of electric vehicles. Reduce the barriers to purchase an electric vehicle
- Make it more attractive to operate an electric vehicle by soft incentives.

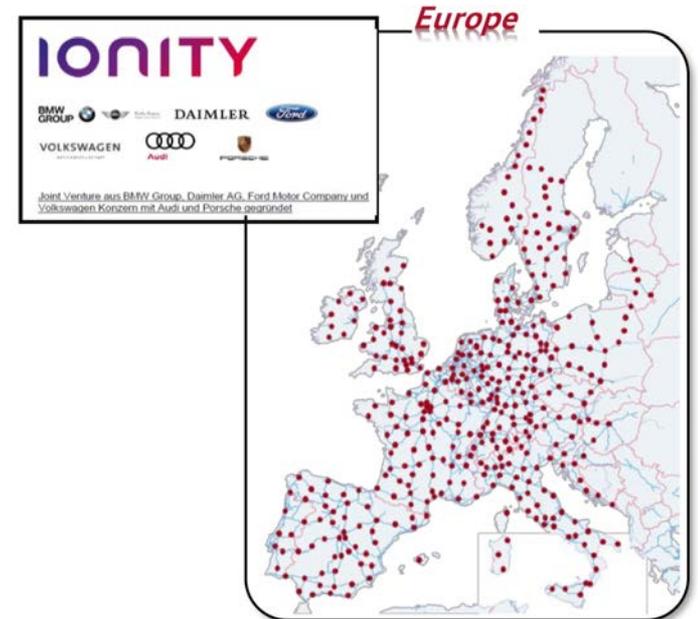
### EU Level:

- Establish EU plan
- Use funding programs (CEF calls, REDI)
- Monitor and follow up (e.g. by EAFO, the European Alternative Fuels Observatory)
- Implement the SET Plan TWG “Fast Charging Flagship”

### Member states:

- Establish National plan transposing at least European obligations, and going beyond on a voluntary basis
- National funding plans
- Authorization process

## Industry initiative



- 400 sites until end of 2019 planned
- Roughly 6 charge points per site



- **Presentation of the EBA@250 industrial stream by Diego Pavia at the Clean Energy Industrial Forum in the panel lead by VP Šefčovič.**
- **Delivery of the finalized package (recommendations, actions and time-impact dashboard) to the European Commission by the beginning of March.**

# EU Battery Alliance, way forward

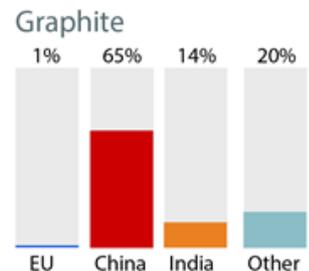
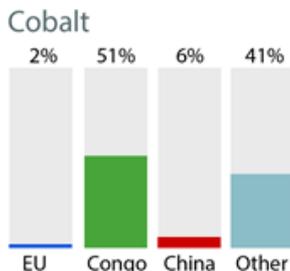
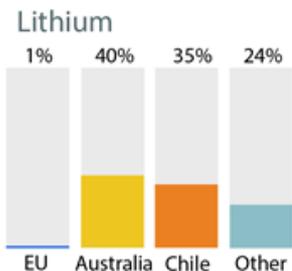
- **The finalized package (recommendations, actions and time-impact dashboard) was delivered to the European Commission by the beginning of March.**
- **The Commission is currently discussing the next implementation steps and formulating an official mandate for InnoEnergy.**
- **A physical meeting with all stakeholders planned on April 25 where (1) we will be sharing the implementation ambitions and plans, and (2) we will already identify, elaborate, and eventually launch some of the actions and business opportunities identified.**

# Battery manufacturing in Europe

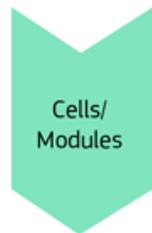
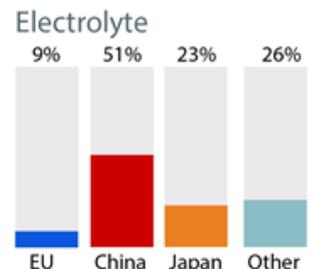
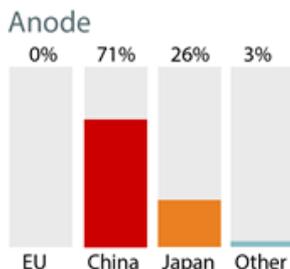
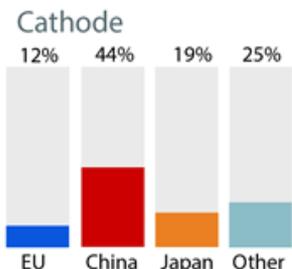
# Supply chain dependence EU battery industry



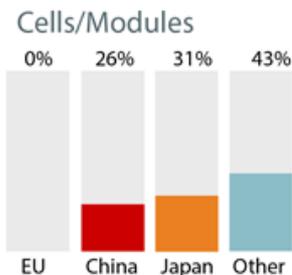
Raw materials



Processed materials



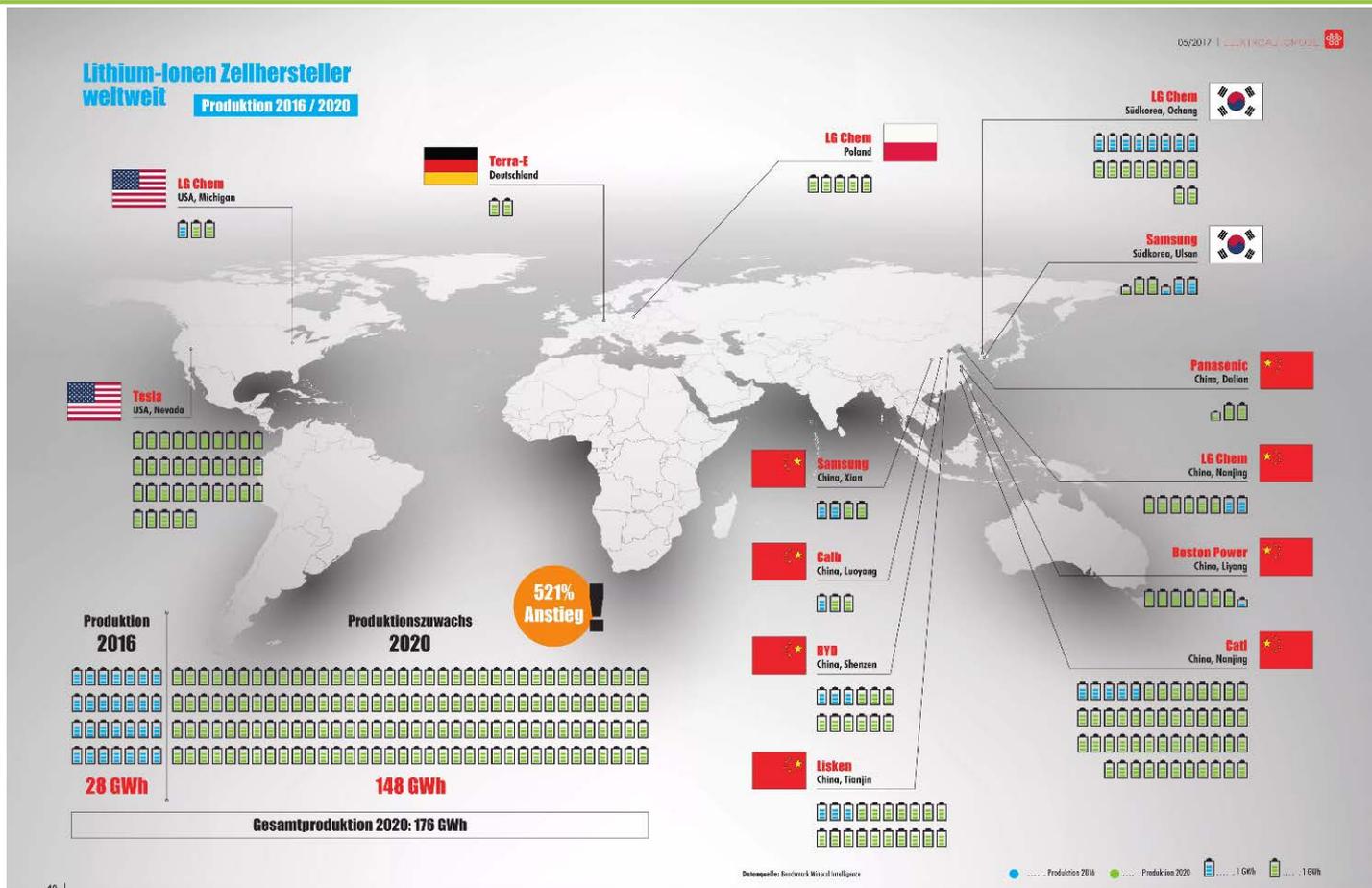
Cells/ Modules



High dependence on both materials & components for Li-ion batteries

Source: Stathis Peteves et al., JRC, Materials' supply chain bottlenecks in the course of the EU energy transition, WRF 2017

# 5 x times increase in production to 2020



## Tesla-avhopparen vill starta svensk batterifabrik

2016-09-29 14:40 Av: [Linda Nohrstedt](#)



Teslas förre logistikchef, svenske Peter Carlsson, jobbar för att Sverige ska få en batterifabrik likt Teslas Gigafactory. Det meddelade han för första gången offentligt under onsdagen.

September 2016  
the plan went public.

# Northvolt Labs in Västerås; EIB loan Febr 2018

**Northvolt beviljas 520 miljoner kronor i lån från EIB till batterifabrik**



## First large-scale battery factory in Europe



## De startar Sveriges första storskaliga fabrik för litiumjonbatterier

2018-01-29 16:18

Av: Johan Kristensson

2 kommentarer



Alelion ska bygga en fabrik för modultillverkning och montering av litiumjonbatterier i Göteborg. Den blir Sveriges första storskaliga fabrik för modultillverkning.

## Kinesisk företag planerar batterifabrik i Trollhättan

Publicerat onsdag 14 mars kl 16.15



Nevs koncernchef: En väldigt positiv händelse

(2.05 min)



Jianghua Su och Stefan Tilk på dagens presskonferens.



Det kinesiska företaget GSR satsar nu fyra miljarder kronor i elbilstillverkaren Nevs i Trollhättan. Samtidigt har GSR planer på att bygga en batterifabrik i Trollhättan.

## Nya batterifabriker kan få grafitgruva att öppna igen

2018-04-05 06:00

Av: Ania Obminska

29 kommentarer



Woxnagruvan utanför Edsbyn i Hälsingland kan snart öppna på nytt. Skälet är den batteriindustri som är på väg att etableras i Europa.

## Regeringen öppnar för fler svenska gruvor

2018-02-14 13:45

Av: TT

7 kommentarer



Sverige har "unika tillgångar" i berggrunden, enligt regeringen. Nu ska Bergslagen genomsökas i jakt på nya metaller, enligt ett beslut som tas imorgon.

– Ett av de mest intressanta områdena i Sverige och världen är faktiskt Bergslagen, säger närings- och innovationsminister Mikael Damberg (S), till TT.

Det gäller då metaller som exempelvis kobolt, litium och sällsynta jordartsmineraler. Efterfrågan på dessa, och andra, mineraler har ökat eftersom de används i exempelvis mobiltelefoner, elbilsbatterier och inom sol- och vindkraft.



## **Drygt 50-tal forskare från tre olika institutioner:**

Institutionen för kemi – Ångström (oorganisk kemi, polymerkemi och strukturkemi) och fysik och astronomi (kondenserade materien och teoretisk fysik)

**Framförallt experimenterare men också teoretiker**

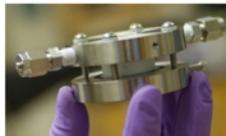
Dessutom ca 6 personer i prof. Maria Strömmes grupp i nanoteknologi Inst teknikvetenskaper

**Minst ca 50 internationella publikationer per år**

**3-5 disputationer per år**

**Disputerade finns i svensk industri och i olika akademiska miljöer**

Batterifondsprogrammet



# The EBA@250 continues with a new and extended mandate

www.innoenergy.com

**MAROŠ ŠEFČOVIČ**  
Vice-President of the European Commission

Brussels, 11 April 2018  
ARES(2018) 1340726

**Subject: The EBA@250 Action plan – your letter dated 29 March 2018**

Dear Mr. Pavia,

First and foremost I would like to personally thank you and your team for all the work accomplished under the European Battery Alliance (EBA).

By my letter dated 15 October 2017, I had asked InnoEnergy “to continue its ground work in partnership with EU industry, academia, financial sectors, with a view to delivering first recommendations on enabling framework conditions” by March 2018.

I am pleased by the breadth and depth of the work completed in such short time frame, and the effective way in which you managed to mobilise EU industry, the innovation community and other stakeholders (more than 120 actors in total) to deliver a list of 21 priority actions (out of 49). I am also happy to see that there is a series of important actions that the EU industry is committed to carrying forward in a lead capacity, including: strategic investment in cells manufacturing, in skills and training, in demonstration lines for primary/secondary raw material processing, building of a clearing house for battery recycling, and many more.

Following these key recommendations, I will present in the forthcoming weeks the Third Mobility package including a **strategic action plan dedicated to batteries**. This will consist of the strategic actions the **European Commission wants to carry forward**, based visibly on the input from the industry, to support the establishment of a complete value chain in Europe.

As you know we are working in parallel with interested Member States and industrial stakeholders on the setting up of relevant manufacturing projects and their corresponding ecosystems in Europe.

Our objective is ultimately to serve as the “**system facilitator**”, that was called for by the industry to bring all segments of the value chain together and gather key players under the European Battery Alliance in order to scale up production of battery cells in Europe.

Diego Pavia, EIT Innoenergy CEO  
Email: [Diego.Pavia@kic-innoenergy.com](mailto:Diego.Pavia@kic-innoenergy.com)

*I am pleased by the breadth and depth of the work completed in such short time frame, and the effective way in which you managed to mobilise EU industry, the innovation community and other stakeholders (more than 120 actors in total) to deliver a list of 21 priority actions (out of 49). I am also happy to see that there is a series of important actions that the EU industry is committed to carrying forward in a lead capacity, including: strategic investment in cells manufacturing, in skills and training, in demonstration lines for primary/secondary raw material processing, building of a clearing house for battery recycling, and many more.*

*But to be effective, this action plan needs to continue to be industry-led in its implementation phase. I am convinced that thanks to your continued support and dynamic network we will manage to deliver on our ambitious plan and related deliverables. As you very well know, time is of the essence on this matter. **I therefore welcome the fact that InnoEnergy will pursue its important implementation work with industrial and other key stakeholders, with a view to delivering your first tangible results already before the end of the year.***

***I do look forward to our continued cooperation under the umbrella of the European Battery Alliance.***

- **Batteries will change the power and transport sectors**
- **Tipping point in battery market around 2020**
- **EU can play a major role along the entire value chain**
- **EU Battery Alliance is a key initiative**

# EU Battery Alliance, way forward