InnoEnergy

Co-funded by the European Union

Overview of the domestic battery industry and opportunities in Europe

10th May 2022

EIT InnoEnergy at a glance
Reducing risk and time-to-market for energy innovations

EIT InnoEnergy Objectives

- Ensure security and safety of supply
- Reduce costs in the energy value chain
- Reduce CO_2 emissions
- Improve European competitiveness
- Remove barriers to innovation
- Encourage sustainable growth
- Create jobs

EIT InnoEnergy is the trusted open innovation ecosystem for sustainable energy in Europe

EIT InnoEnergy Activities

Human Capital: Master Programs and professional learning

Incubation: Investing in early-stage start-ups and scale-ups

Innovation: Investing in product development

Setting up Industrial value chains: European Battery Alliance (EBA), European Green Hydrogen Acceleration Center (EGHAC), European Solar Initiative (ESI)

Goal: Support innovations to go to market with less risk and reduced time

Promotion and co-creation of industrial projects across the value chain
Building connections with other industrial and energy value chains
Acceleration of technology development

Supporting innovations to get financed and help them to access foreign markets

Supporting European innovations to access local markets

EIT InnoEnergy
HUB Hungary is run by

eit InnoEnergy
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Building global connections

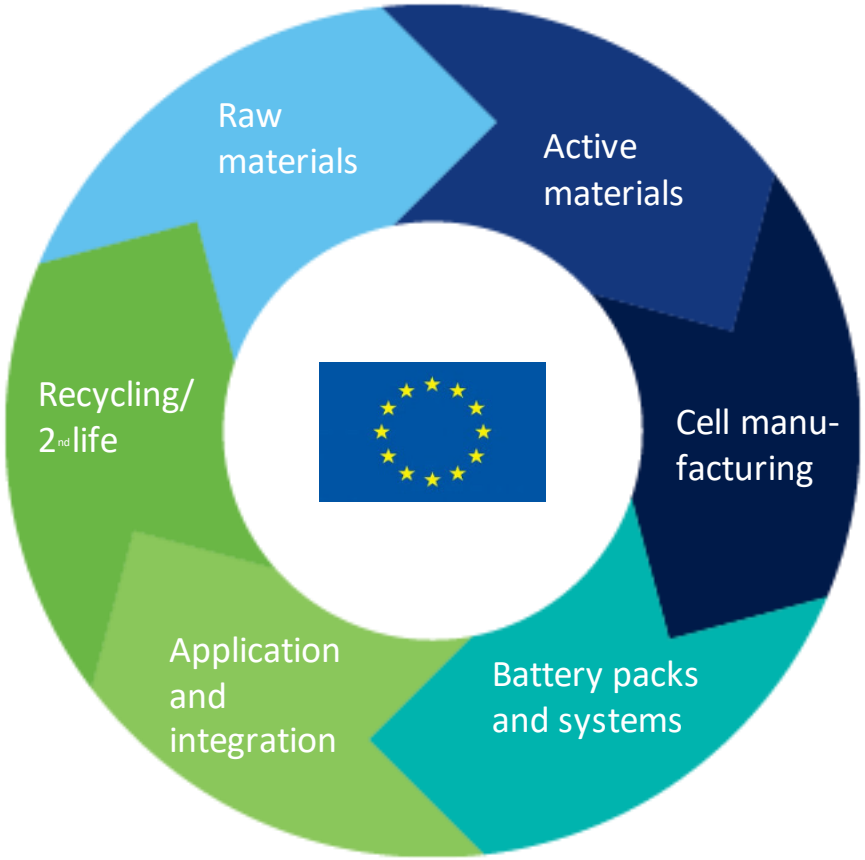
- Offices across **Europe** and in the **US**
- **500+** partners
- **27** shareholders

The opportunity: Europe becoming the fast follower in batteries

EUROPEAN BATTERY ALLIANCE | EBA250

This cooperative ecosystem gathers the European Commission, interested EU countries, investment institutions and key industrial, innovation and academia stakeholders

EIT InnoEnergy has been trusted by the European Commission to drive forward and promote EBA250 activities, acting as network manager and project facilitator



Creating a **competitive and sustainable battery industry** in Europe by 2025, to capitalize on opportunities and capture a new market worth €250B/year

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Boom in battery production in Europe supported by concerted policy and investment effort

Securing Access to Raw Materials

- Communication on critical raw materials
- Raw Materials Alliance with a focus on upstream supply chain elements

Accelerate R&D Innovation

- Various programs such as Horizon 2020, Batteries Europe, Horizon Europe, Battery 2030+ promoting technology leadership

Sustainability Focus

- Battery Regulation Proposal (Dec 2020) as part of a Circular Economy Action Plan

Supporting Cell Manufacturing

- Important Projects of Common European Interest to the tune of €3.2bn (Dec 2019) and €2.9 BN (Jan 2021) launched and funded

Securing Skilled Workforce

- Dedicated projects such as ALBATTS, DRIVES, and COSME
- Automotive Skills Alliance launched (Nov 2020)

Policy Consistency

- Aligning broader frameworks like EU's trade policy, clean energy strategy, mobility packages, and Green Deal

Sources: European Commission, Oliver Wyman

Increasing activities in all part of the value chain – EBA is a European success

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Raw materials | Active Materials | Battery Manufacturing (Machinery | Cells | Packs | Systems) | Application & Integration (E-mobility | ESS | Ind. applications) | Recycling & 2nd life

NORWAY
Active Materials: SKALAND and ELKEM (graphite anodes)
Battery manufacturing: MORROW and FREYR

FINLAND
Raw Materials: KELIBER (lithium)
Active materials: BASF
Recycling: Fortum/BASF/NORNICKEL

UK
Raw Materials: Cornish Lithium
Battery Manufacturing: ENVISION, BRITISHVOLT

GERMANY
Raw Materials: VULCAN (lithium)
Active Materials: BASF
Battery manufacturing: ACC, NORTHVOLT/VW, TESLA, CATL, VARTA, BMW, CELLFORCE, AKSAOL, MICROVAST, FARASIS
Recycling: VW, PROMOBIUS

NETHERLANDS
Active Materials: LEYDEN-JAR

BELGIUM
Active Materials: UMICORE, LEYDEN-JAR
Recycling: UMiICORE

FRANCE
Battery Production: ACC, VERKOR
Recycling: SNAM/HONDA

SPAIN
Raw Materials: Infinity, LITHIUM IBERIA (lithium)

ITALY
Battery Production: FAAM/LITHOPS
Application &Integration: ENEL (ESS)

CZECH REPUBLIC
Raw materials: CINOVEC (lithium), EURO MANGANESE (managense)
Battery Production: MES

HUNGARY
Battery Production: SAMSUNG, SKI Innovation

SLOVAKIA
Battery Production: INOBAT

SWEDEN
Raw Materials: TALGA, VOXNA (graphite)
Active Materials/Battery manufacturing/Recyding: NORTHVOLT
Applications: EPIROC (industrial), SEEL (IPCEI)

DENMARK
Application& Integration: DTU (ESS) , LITHIUM Balance (BMS)

ESTONIA
Battery Manufacturing: SKELETON (supercaps)

IRELAND
Raw materials: INTERNATIONAL LITHIUM (lithium)

PORTUGAL
Raw materials: SAVANNAH (lithium)

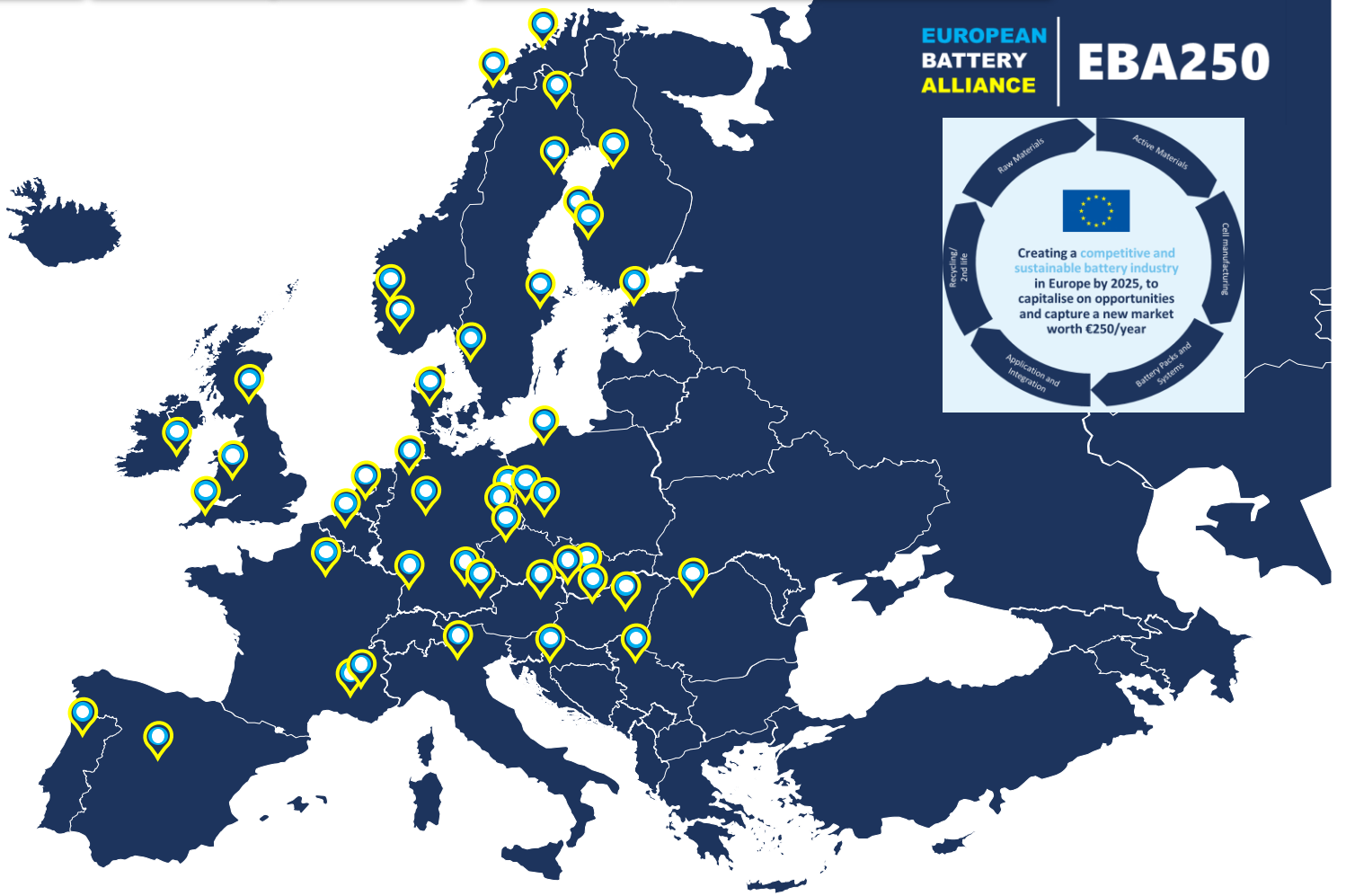
POLAND
Active materials: UMICORE
Battery manufacturing: LG CHEM

ROMANIA
Application & Integration: ROMBAT

SERBIA
Raw materials: RIO TINTO, NEOMETALS (lithium)

AUSTRIA
Raw materials: EUROPEAN LITHIUM (lithium)
Application & Integration: MAGNA STEYR (E-mobility), CYBERGRID (ESS)

CROATIA
Application& Integration: RIMAC (e-mobility)



2020: ~ 26 GWh Capacity

Battery manufacturing capacity

2030: ~ 500 GWh Capacity

Promising

- 2800 B Forints (€7,4 B EUR) CAPEX already spent by 6 foreign companies *(67% decided in 2021)*
- Further foreign direct investments (FDI) expected.
- Governmental goals: 2nd or 3rd position in exported value of batteries in Europe
- Hungarian successes (selling on the market):
  - Supply to Northvolt
  - Component, cabinet supply
  - Assembly of battery packs

Challenging

- Most of the investments taken by non-Hungarian / non-European players:
  - SK Innovation: 1030 B,
  - Samsung: 763 B,
  - LG Chem-Toray: 270 B,
  - Ecopro BM: 264 B
- No economic metrics by KSH
- Usually last third of the value chain covered by Hungarian companies
- No design and brand -> smaller value added
- Technology and high value components procured from abroad
- No news of Hungarian successes in the press

National industrial strategy with EIT InnoEnergy

The planned Strategy covers the entire value chain of battery production: from raw materials through cell production to their use and recycling. The focus of the work related to the preparation of the Strategy is to enable Hungary - together with industrial partners, authorities, the academic and financial sector - to be integrated into the European ecosystem, the European Battery Alliance.

The preparation of the Strategy is a result of the activities of ITM & EIT InnoEnergy, with the involvement of key industry experts.

Ilka von Dalwigk
Policy Manager, European Battery Alliance

Johan Söderbom
Head of Unit, Smart grid & Storage

Bo Normark
Senior Industrial Executive and Founding Member of the European Battery Alliance

Hungarian Ministry of Innovation Technology

MINISTRY OF INNOVATION AND TECHNOLOGY

CORE TEAM

Fruzsina Csonka
Business Developer
Project Coordinator

Andrew Machirant
Senior Commercial Advisor

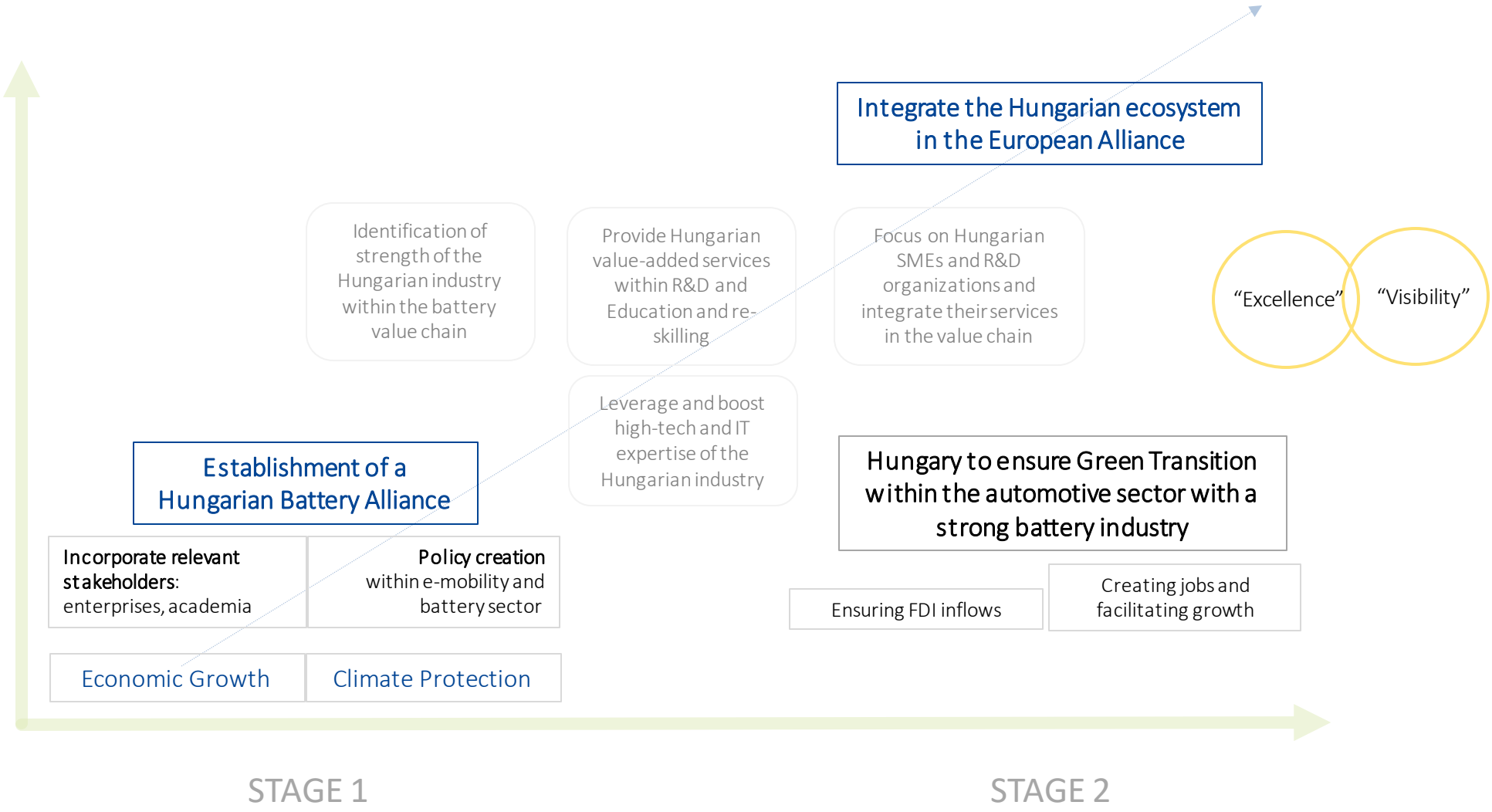
Ákos Dervalics
EIT InnoEnergy Hub Hungary

PROJECT PARNERS

Zoltán Vigh
Executive Director
Jedlik Anyos Electromobility Cluster

JEDLIK ÁNYOS KLASZTER
ELECTROMOBILITY IN HUNGARY

Goals and Vision – Hungarian Battery Strategy



Results: action plan for a vertically integrated battery industry

Objectives	Pathways	Actions	Goals
Decarbonizing the transport and power system using batteries and increased electrification	Develop and support sustainable **market solutions** for the use of batteries in the power, transportation and industry sectors in line with EU climate goals	• Implement the EU Sustainable Battery Regulation to open new business opportunity • Develop a beneficial market design for the use of batteries • Accelerate decarbonizing of the transport system • Decarbonizing the electricity systems using batteries • Remove regulatory barriers for stationary storage • Create regulatory sandboxes for batteries as a service in the grid • Create opportunities for stationary storage on different levels (peaking plants to household levels) • Increase access to batteries for stationary storage applications	• Position Hungary on the **forefront of electrification** • Achieve **climate goals**
A competitive and sustainable Hungarian battery value chain	Supporting projects **involving Hungarian actors** covering different segments of the battery value chain	• Increase value of production in Hungary • Requirements on FDI's to get integrated in Hun. Ecosystem • Develop financial instruments for sustainable technologies targeting small innovative clean-tech companies along the battery value chain • Create incentives for financing sustainable investments	• Create a network of strong players, including SME's representing the **entire value chain**
Competitive advantage through the growth of a strong Hungarian R&I capacity	Targeting **research and innovation** to support the development of a competitive battery value chain in Hungary	• Strengthen the Hungarian innovation ecosystem • Strengthen the collaboration between academia and industry	• Increase Hungary's **Innovation Scorecard** on a European level
Charged to meet the future demands of an electrified society	Developing and strengthening a **skilled workforce** in the battery value chain	• Increase quantity and quality of battery research and education • Develop skills for an electrified society • Financial support for the training of the workforce along the battery value chain	• Number of **jobs retained** and established as a result of the focus on the battery industry by 2030
Battery materials in a sustainable and circular economy industry	Secure access to raw materials for battery manufacturing through **extraction, recycling and re-use**	• Develop flagship for domestic access to raw materials from mining and recycling • Stimulate re-use and recycling of batteries for increased circular material flows	• **Create value and business opportunities** in the transition to a sustainable and circular economy
Hungary – a focal point for the European battery industry	Stimulate **national and regional collaboration** for a strong position in European Battery value chain	• Implement and follow up the action proposals through broad collaboration throughout the battery value chain • Facilitate access to the European value chain for batteries • Positioning Hungary in the European battery ecosystem • Working actively in European Networks	- Establish **strategic partnerships and business opportunities** with neighboring economies - Connect the relevant local stakeholders to the European battery industry and thereby expanding value chains - Possibilities to influence EU agenda

The Hungarian Battery Alliance – Implementation of the Strategy

2021

2021. 07. 01.
Foundation of the Hungarian Battery Platform

Adoption of the National Battery Strategy 2030

6 working groups of the Platform start working

Platform transformed into the **Hungarian Battery Association**

2021. 09. 30.
Hungarian Battery Day (Budapest)
Hungarian Battery Association joins EBA

Signing MoU about implementation of trainings and education based on the „European Battery Academy" in Hungary

2022

Preparation of highlighted industrial projects for deployment

39 founding members in

Working groups

1. Manufacturers and suppliers
2. R&D&I and Education
3. E-mobility
4. Stationary storage
5. Manufacturing and recycling
6. Regulations

HUNGARIAN BATTERY DAY

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CONFERENCE AND MATCHMAKING
HUBA joins the European Battery Alliance

EBA Academy in Hungary

	Automotive	Battery	Energy
		Raw materials → Active materials → Battery cells & packs → Aplications → Recycling/ 2nd life	
Key challenges/ opportunities	Net-impact of **10-25%** job losses because of automotive transformation acc. to McKinsey* "35% of workers in the automotive industry are expected to require retraining in the next two years, and we certainly have less than 8 years to complete all retraining." (BCG, KPMG)	Integration of Hungarian corporates and SMEs into the European battery supply chains increase the Hungarian added value. Strategic execution of one of the key pillars of the Hungarian Battery Strategy (Education)	Business model shift of utilities Changing role of the distribution players regarding grid management and storage solutions- Increasing role of the need for storage on B2B and B2C segments Grid stability and security, increasing distributed energy generation
Future needs (employment)	Direct: **30.000** to require re-skilling Indirect:**35.000** to require re-skilling	Direct: **10.000** New jobs in 5-6 years Indirect: **40-50 000** new jobs	Direct: about **3.000** can require new skills and upskilling Indirect: **9.000** can require new skills and up-skilling
Solution	Main focus on re-skilling (2-5 years)	Main focus on deploying new knowledge base	Main focus on knowledge base extension of current workers

Opportunities of the Hungarian Battery Industry

Domestic added value

Power of suppliers	*Implementing the competence development projects of the Hungarian Battery Industry Association*
Reskilling and upskilling training the workforce	*Launch of EBA Academy in 2022*
Financial resources	*Joining European R&D funding programmes and consortia with funding opportunities* *Providing financial support for R&D, CAPEX and trainings*
Market incentives	*Stimulating the domestic battery market to provide domestic manufacturers with a reference and initial income*
Technology development	*Joining European consortia for strategic development paralel with global targets*

Ákos DERVALICS
Country Manager
EIT InnoEnergy HUB Hungary
akos.dervalics@innoenergy.com

EIT InnoEnergy
Kennispoort 6th floor
John F. Kennedylaan 2
5612 AB Eindhoven
The Netherlands
info@innoenergy.com
www.innoenergy.com

EIT InnoEnergy is the innovation engine for sustainable energy across Europe, supported by the European Institute of Innovation and Technology (EIT). InnoEnergy has been entrusted by the European Commission to drive forward and promote the EBA250 activities.
EIT InnoEnergy's role in the European Battery Alliance is to provide background data and to define key questions, recommendations and actions. InnoEnergy also supports the establishment of a European battery ecosystem by providing EBA250 workshops, a meeting place for key stakeholders along the entire value chain.
Take a look at our portfolio of 300+ technologies, here.