THE ROLE OF BATTERIES IN HUNGARY'S GREEN TRANSITION

Péter Kaderják, PhD.

President of the Hungarian Battery Association

Director of Zero Carbon Hub, Budapest University of Technology and Economics

20 April 2023

Visegrád, Hungary

HUNGARIAN BATTERY ASSOCIATION

Net Zero objectives and batteries

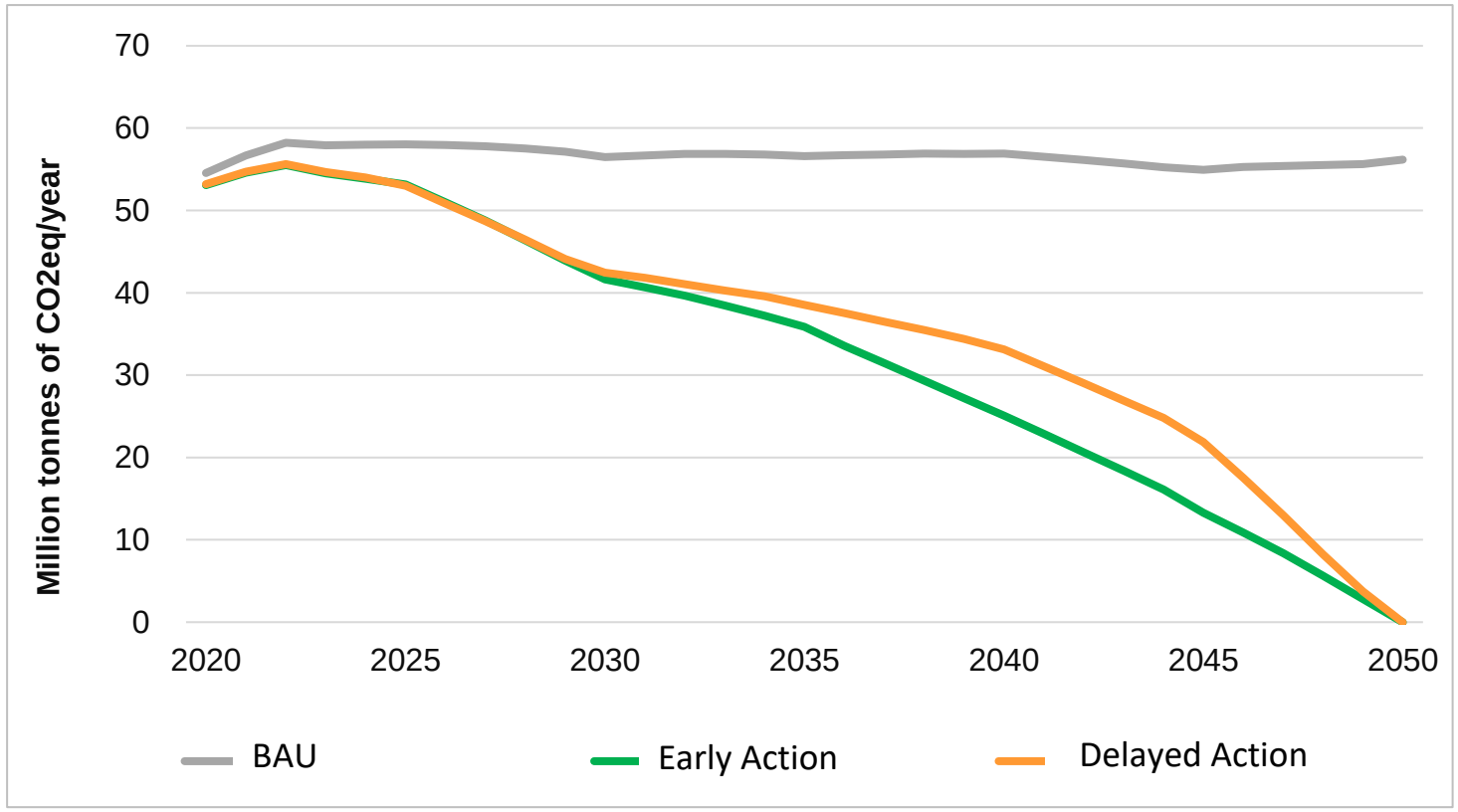
Battery value chain development trends in Hungary

Environmental and social sustainability of the industry

HUNGARIAN BATTERY ASSOCIATION

Hungary is dedicated to reach net zero by 2050
This requires to invest 3-4% of GDP/a over three decades

Net Greenhouse Gas (GHG) emission scenarios for Hungary, CO2eq/y

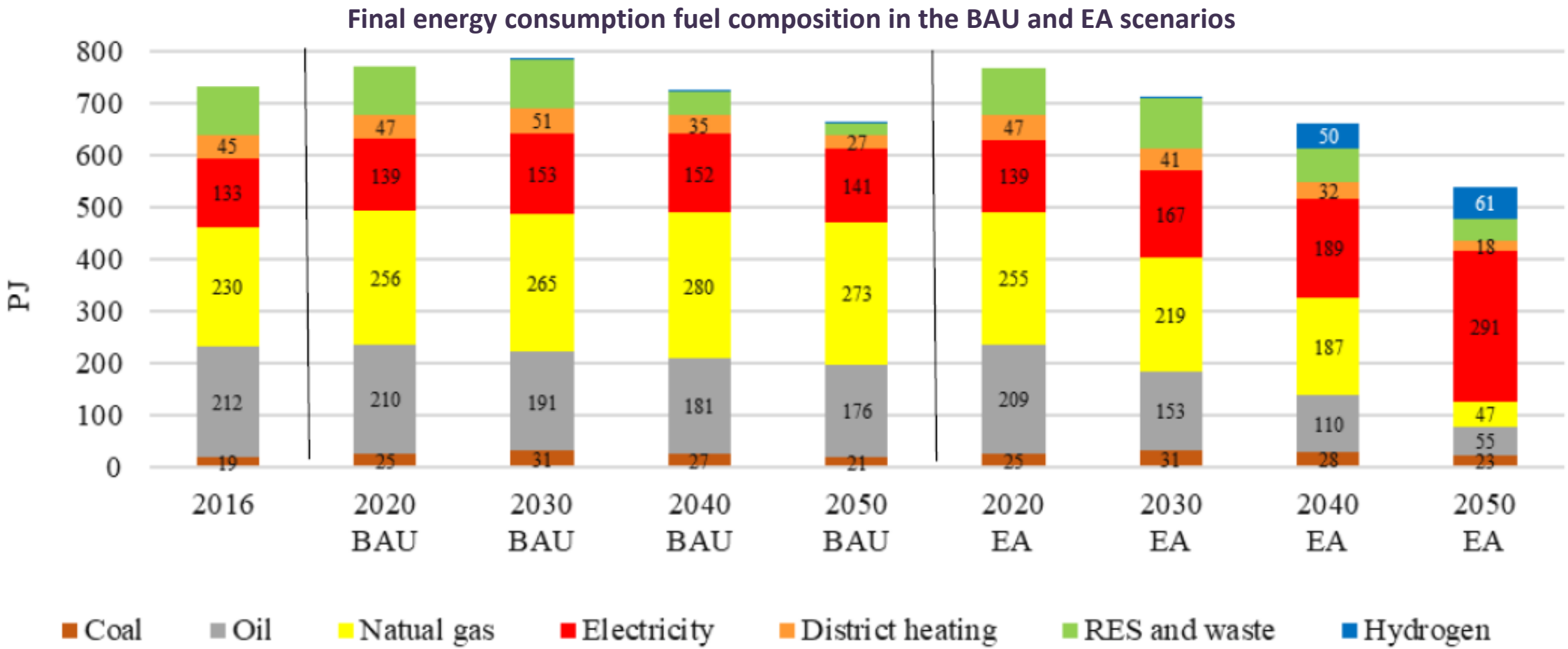


Early Action (frontloading of green investments) **brings the highest societal benefits**

HUNGARIAN BATTERY ASSOCIATION

Source: National Clean Development Strategy 2050 of Hungary, https://kormany.hu/dokumentumtar/nemzeti-tiszta-fejlodesi-strategia

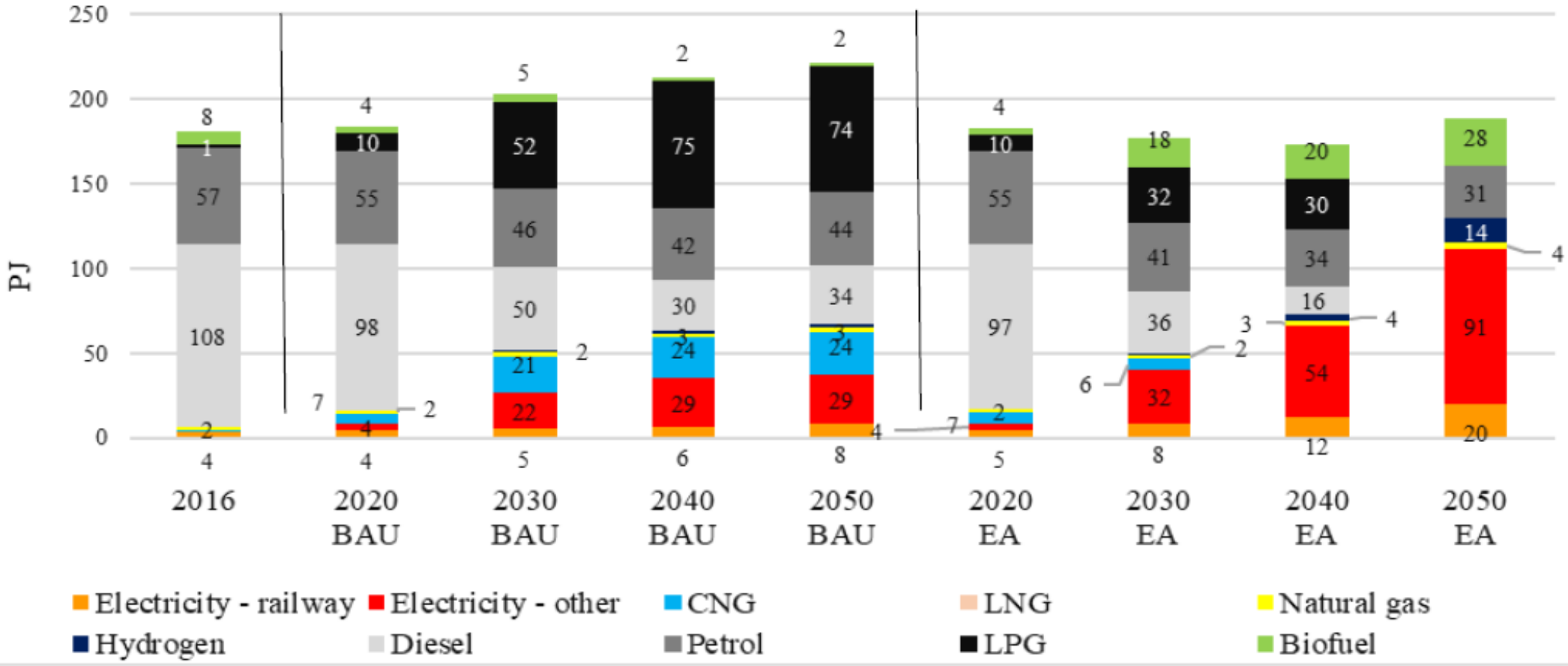
Electrification helps phasing out oil and gas



Source: National Clean Development Strategy of Hungary, 2021

Net Zero Transition puts tremendous pressure on the fuel mix of transport

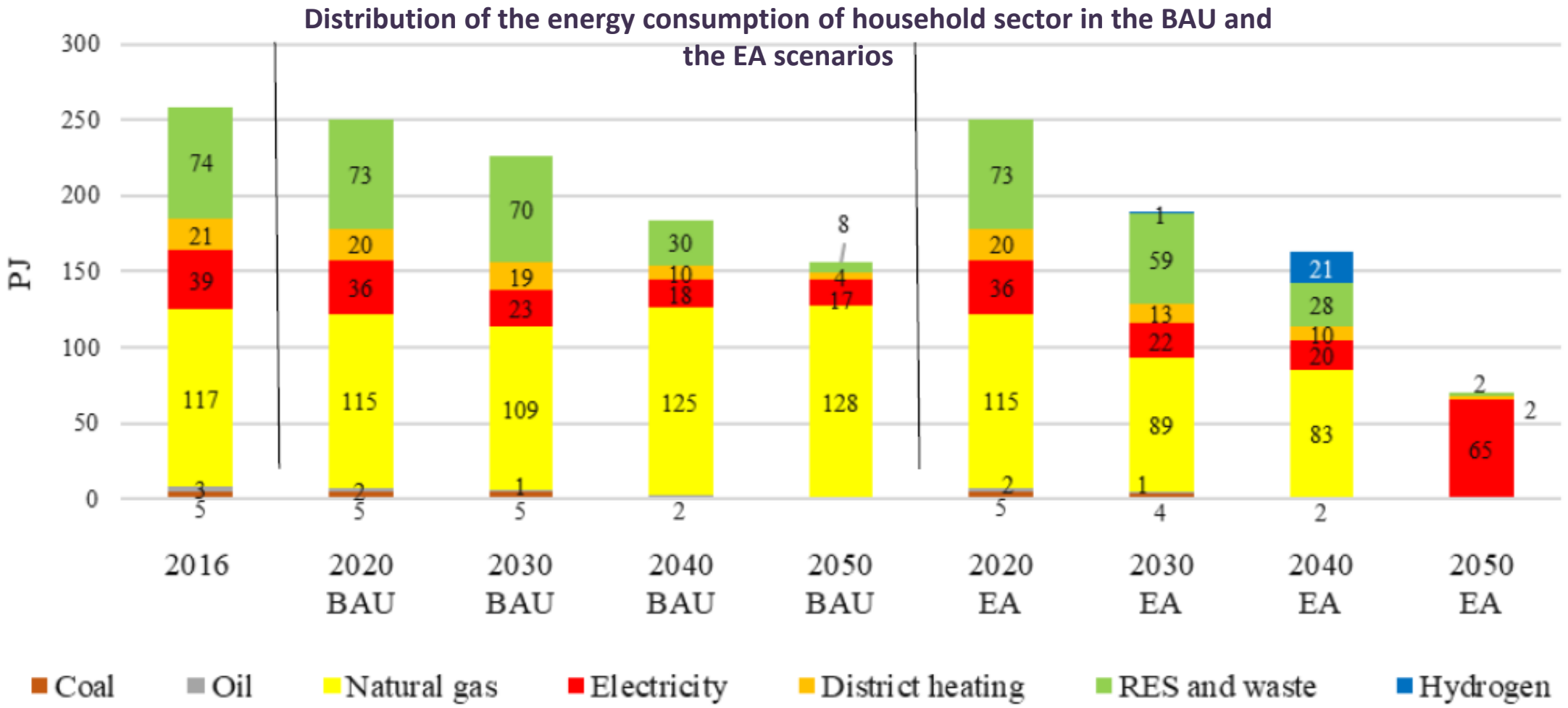
Distribution of the energy consumption of the transport sector in the BAU and the EA scenarios



Source: National Clean Development Strategy of Hungary, 2021

phase-out: diesel; **phase-in**: electrification, hydrogen, biofuels

An almost full electrification of household heating required to phase out natural gas



Source: National Clean Development Strategy of Hungary, 2021

The battery industry supports electricity, transport and household sector decarbonisation…

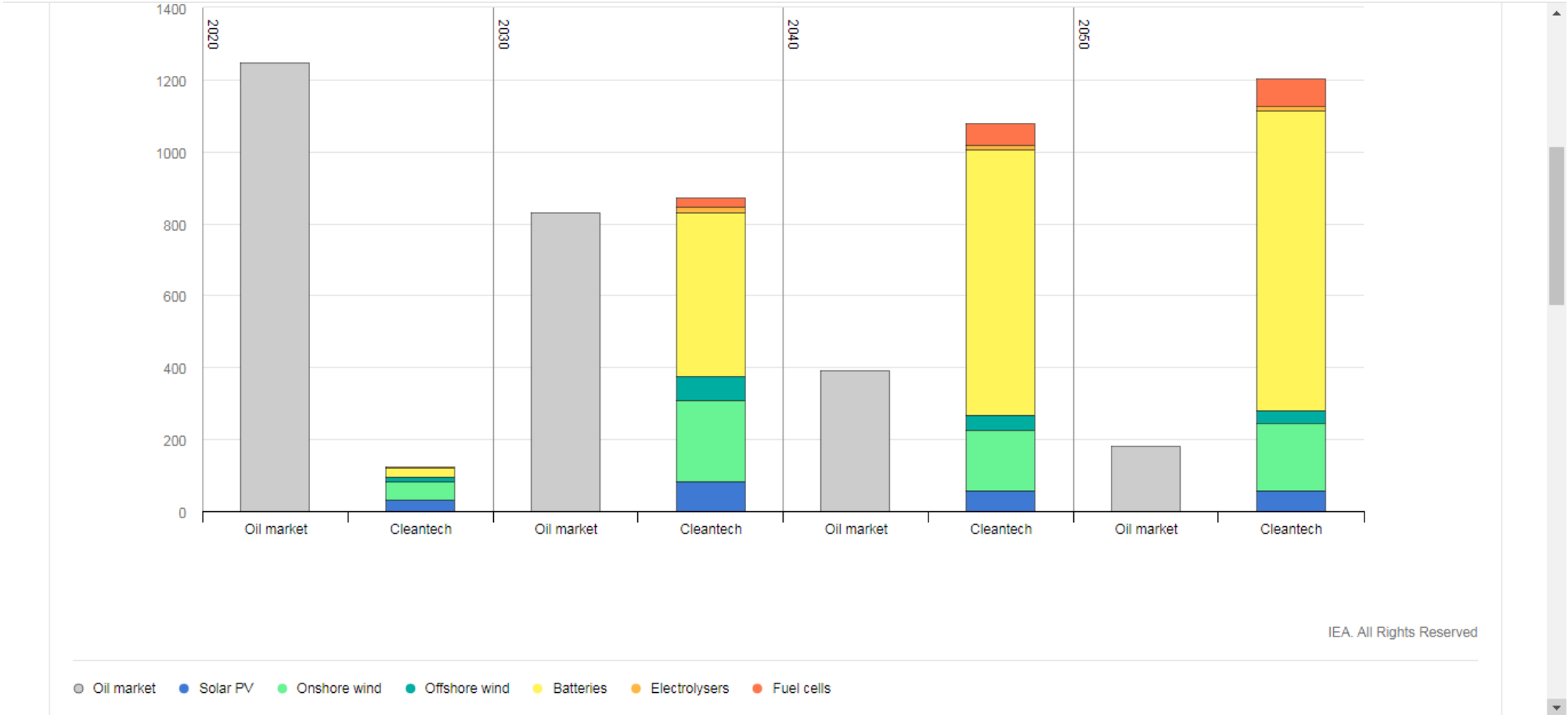
Focus areas for policy action aiming at climate neutrality

Electricity sector decarbonisation	**Transport sector decarbonization**	**Energy efficiency market development**	**Renewable heat solutions**
Developing the hydrogen economy	**Developing the battery value chain**	Carbon Capture, Use and Storage (CCS/CSU)	Digitalization and AI to promote decarbonisation
Greening the financial market (e.g. green bonds)	Agriculture and Land Use, Land-Use Change and Forestry reform	Circular economy	Promoting green jobs, R+D+I and local supply chain

HUNGARIAN BATTERY ASSOCIATION

…and also has a unique market perspective…why?

Estimated market sizes of oil and selected clean energy technology equipment in the Net Zero Scenario, 2020-2050 (USD billion, 2020)

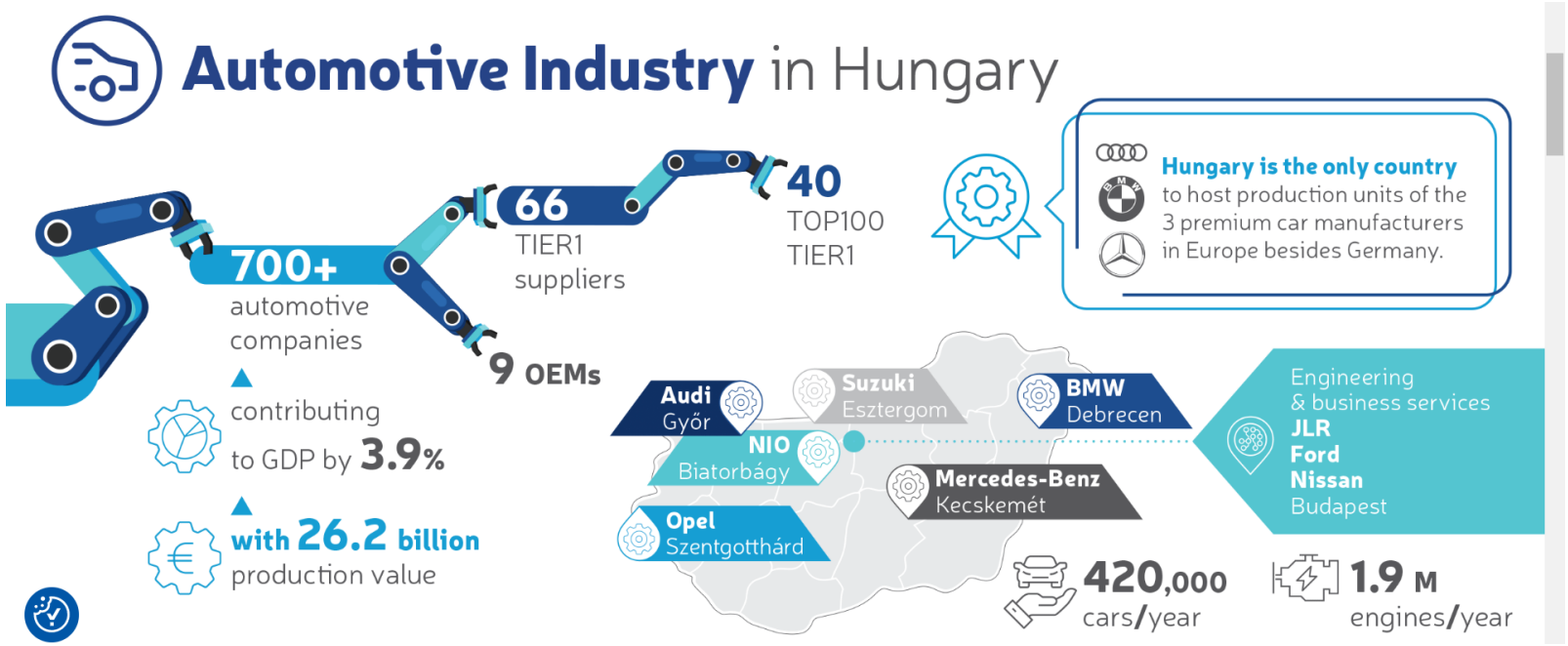


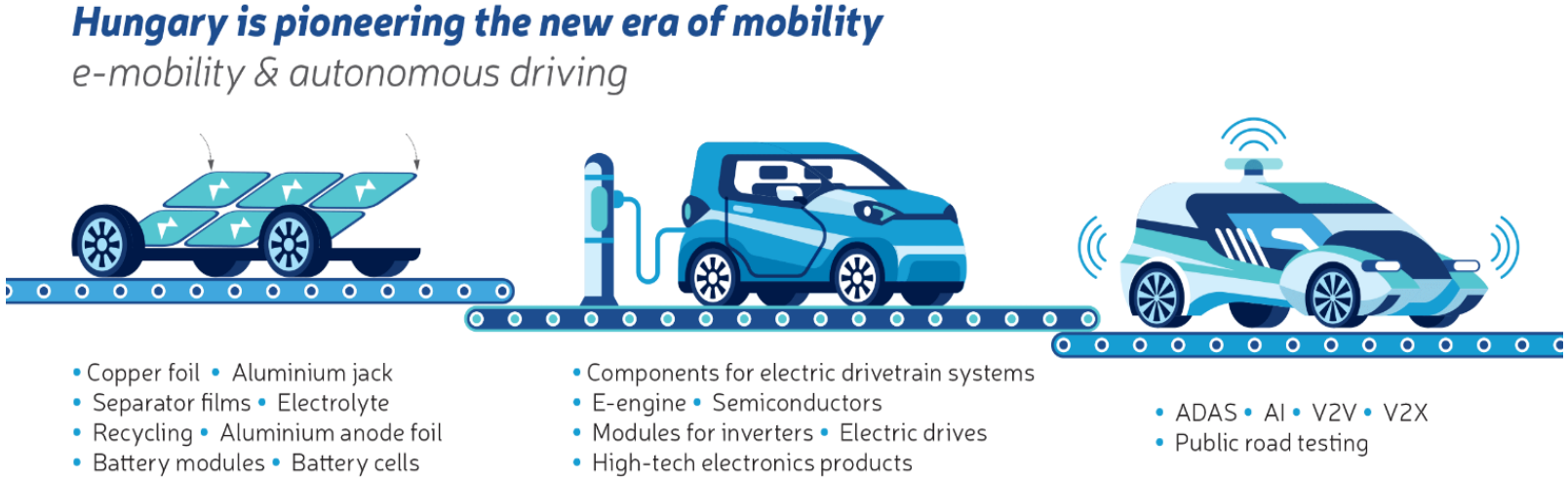
HUNGARIAN BATTERY ASSOCIATION

Source: IEA World Energy Outlook 2021

Automotive industry transformation

- The automotive industry is a cornerstone of the Hungarian economy
- Vehicle manufacturing: 6% of Hungarian GDP
- Automotive suppliers account for an additional 8% to 9%
- Around 30% of industrial output derives from this sector
- Around 90.5% of goods created in the industry are exported to European superbrands

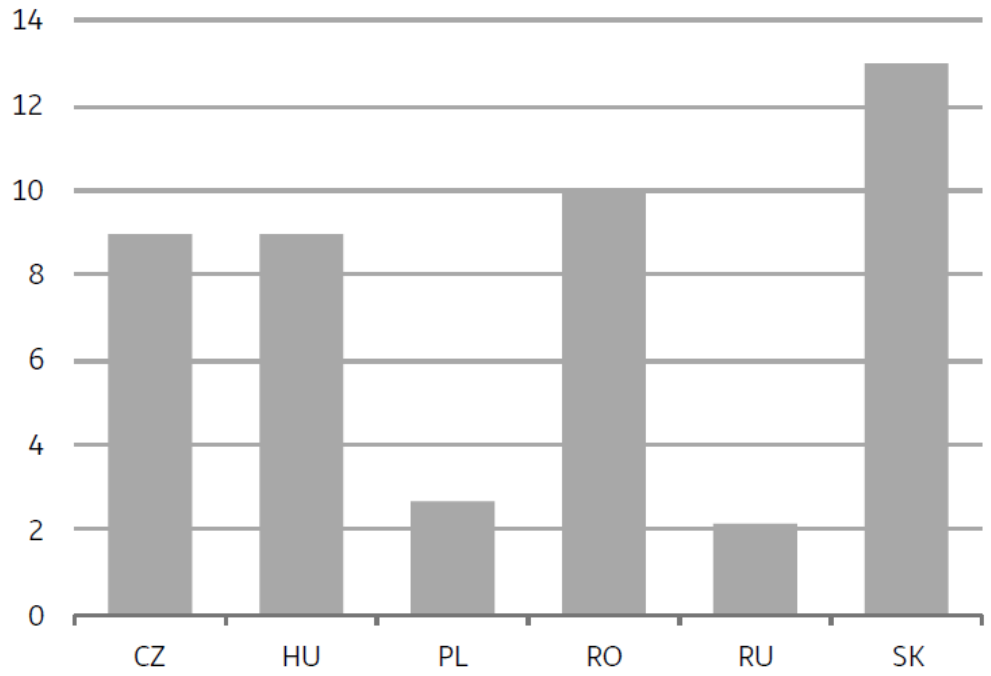




HUNGARIAN BATTERY ASSOCIATION

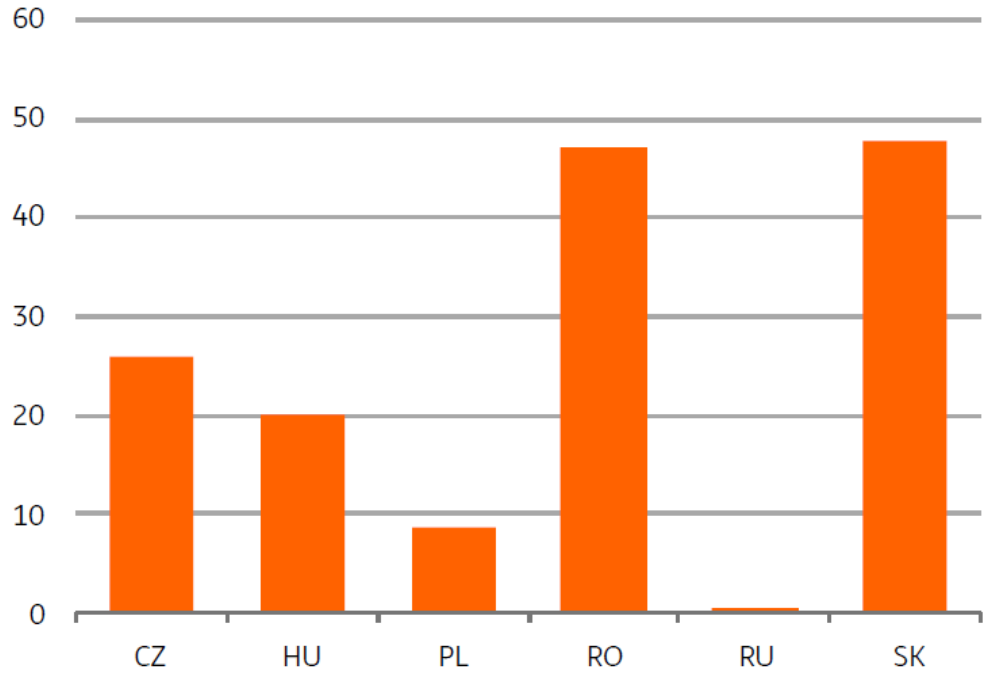
Regional context: successful transformation of automotive & battery industries is a must

Fig 3 Automotive's share of GDP (%)



Source: ING, local statistical offices

Fig 4 Automotive's share of exports (%)



Source: ING, local statistical offices

Net Zero objectives and batteries

Battery value chain development trends in Hungary

Environmental and social sustainability of the industry

HUNGARIAN BATTERY ASSOCIATION

The Hungarian story is part of a common EU project…

The Net Zero Industry Act correctly recognises batteries as a critical enabler for achieving the ambitious EU Green Deal objectives and introduces accelerated administrative procedures and capital support for critical investments along the battery value chain.

EUROBAT statement, March 17, 2023

Beginning May 2023, the European Battery Regulation will be gradually replacing Directive 2006/66/EC. It will be implemented in all the member countries simultaneously for the common purpose of minimising the harmful effects of batteries on the environment

…and promoting West – East co-operation

Home › Transport › SK Innovation builds Europe's largest EV battery plant in Hungary

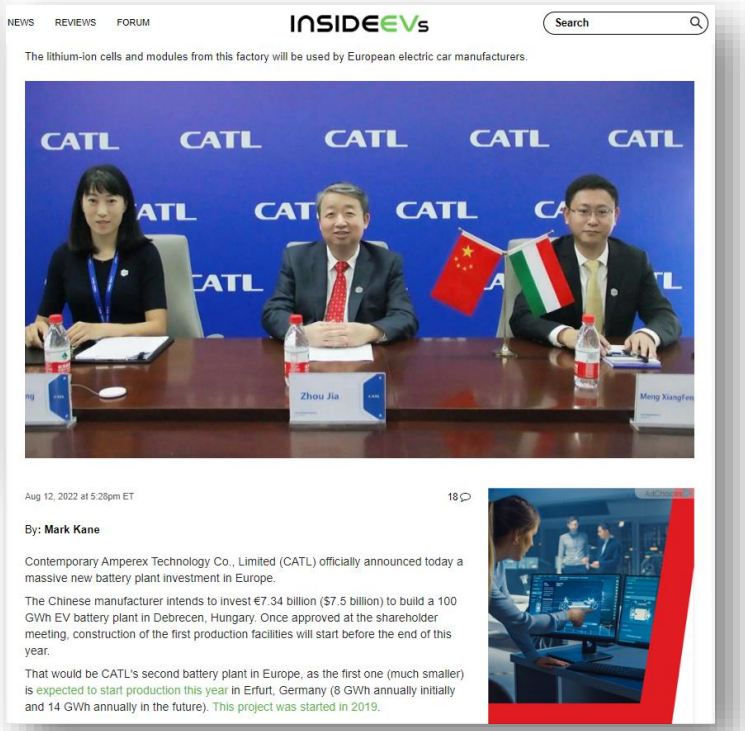
Transport

SK Innovation builds Europe's largest EV battery plant in Hungary

By Evelin Szőke February 2, 2021

Facebook Twitter WhatsApp LinkedIn Email Print

Korea's SK Innovation already operates a 7.5 gigawatts-hour (GWh) factory in the Hungarian town of Komárom and is building the second one at the site. The announced



NEWS REVIEWS FORUM INSIDEEVs Search

The lithium-ion cells and modules from this factory will be used by European electric car manufacturers.

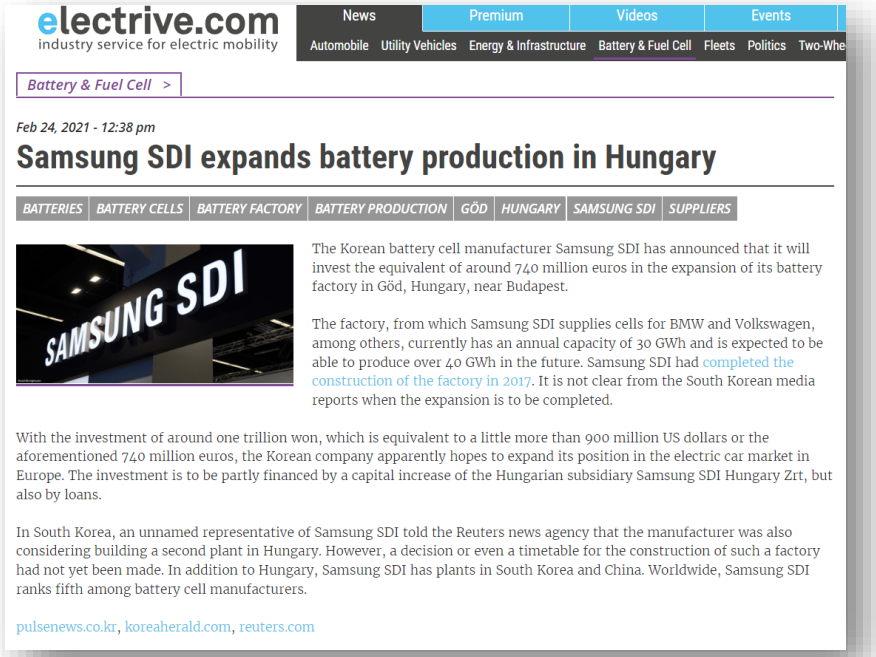
Aug 12, 2022 at 5:28pm ET 18

By: Mark Kane

Contemporary Amperex Technology Co., Limited (CATL) officially announced today a massive new battery plant investment in Europe.

The Chinese manufacturer intends to invest €7.34 billion ($7.5 billion) to build a 100 GWh EV battery plant in Debrecen, Hungary. Once approved at the shareholder meeting, construction of the first production facilities will start before the end of this year.

That would be CATL's second battery plant in Europe, as the first one (much smaller) is expected to start production this year in Erfurt, Germany (8 GWh annually initially and 14 GWh annually in the future). This project was started in 2019.



electrive.com industry service for electric mobility

News Premium Videos Events

Automobile Utility Vehicles Energy & Infrastructure Battery & Fuel Cell Fleets Politics Two-Whe

Battery & Fuel Cell >

Feb 24, 2021 - 12:38 pm

Samsung SDI expands battery production in Hungary

BATTERIES BATTERY CELLS BATTERY FACTORY BATTERY PRODUCTION GÖD HUNGARY SAMSUNG SDI SUPPLIERS

The Korean battery cell manufacturer Samsung SDI has announced that it will invest the equivalent of around 740 million euros in the expansion of its battery factory in Göd, Hungary, near Budapest.

The factory, from which Samsung SDI supplies cells for BMW and Volkswagen, among others, currently has an annual capacity of 30 GWh and is expected to be able to produce over 40 GWh in the future. Samsung SDI had completed the construction of the factory in 2017. It is not clear from the South Korean media reports when the expansion is to be completed.

With the investment of around one trillion won, which is equivalent to a little more than 900 million US dollars or the aforementioned 740 million euros, the Korean company apparently hopes to expand its position in the electric car market in Europe. The investment is to be partly financed by a capital increase of the Hungarian subsidiary Samsung SDI Hungary Zrt, but also by loans.

In South Korea, an unnamed representative of Samsung SDI told the Reuters news agency that the manufacturer was also considering building a second plant in Hungary. However, a decision or even a timetable for the construction of such a factory had not yet been made. In addition to Hungary, Samsung SDI has plants in South Korea and China. Worldwide, Samsung SDI ranks fifth among battery cell manufacturers.

pulsenews.co.kr, koreaherald.com, reuters.com

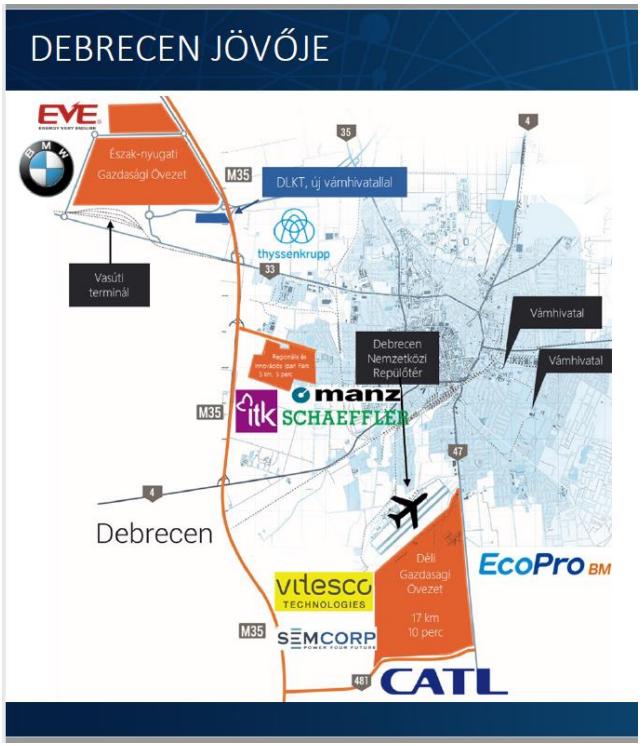
HUNGARIAN BATTERY ASSOCIATION

https://insideevs.com/news/604099/catl-100gwh-battery-plant-hungary/

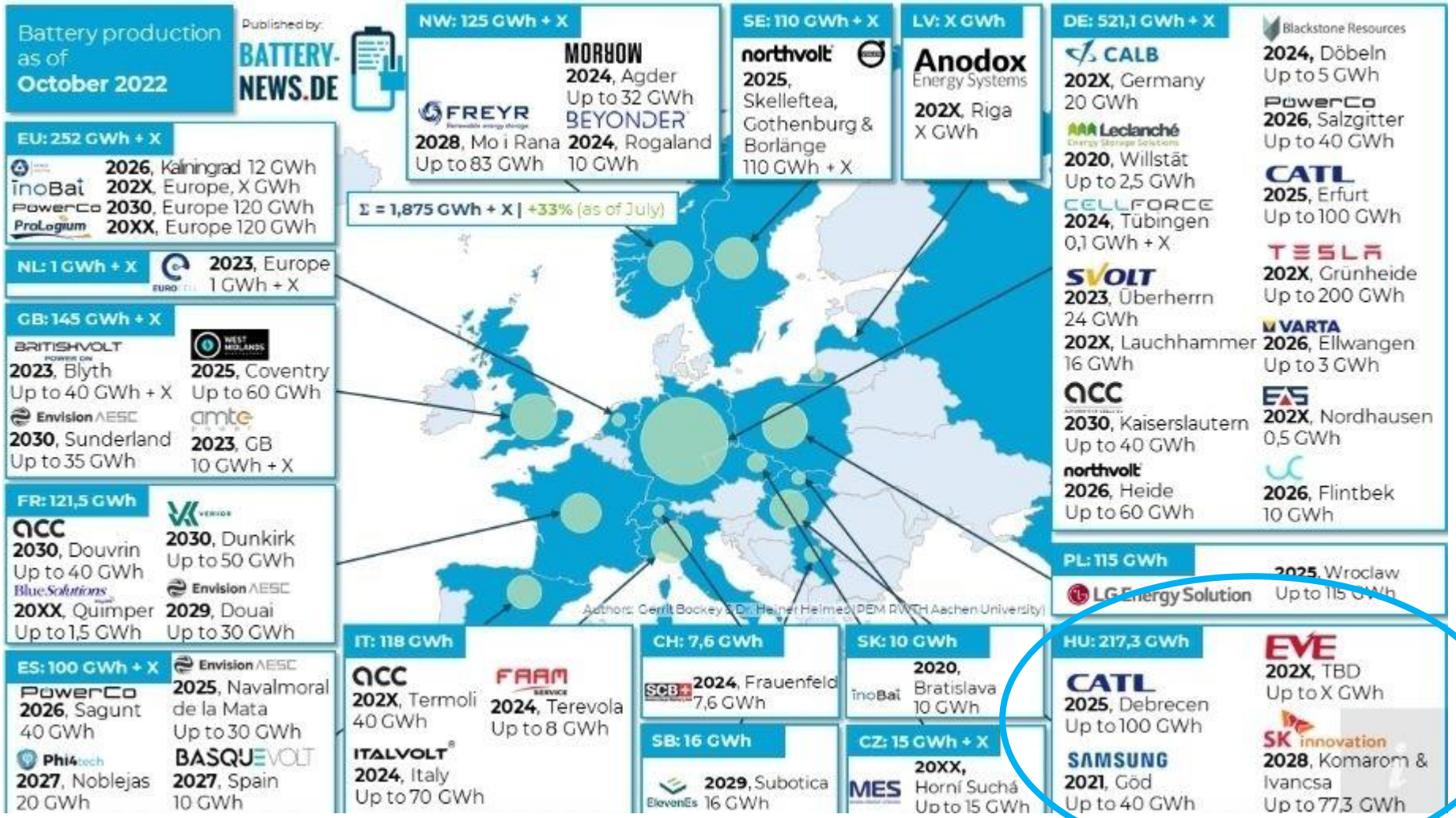
https://ceenergynews.com/transport/sk-innovation-builds-europes-largest-ev-battery-plant-in-hungary/

https://www.electrive.com/2021/02/24/samsung-sdi-expands-battery-production-in-hungary/

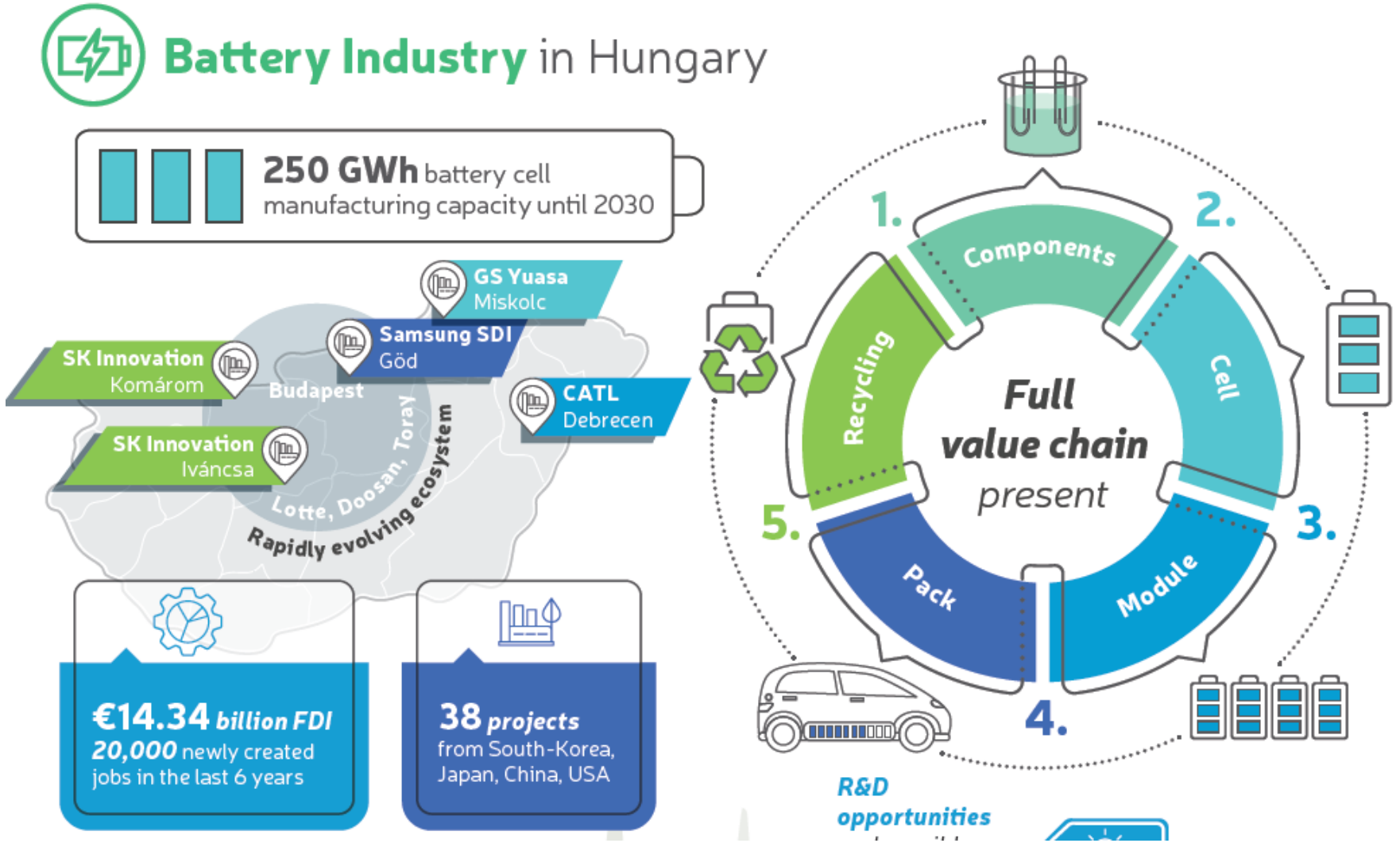
Significant battery value chain is developing in Hungary…



HUNGARIAN BATTERY ASSOCIATION



… primarily due to > €14 billion FDI



HUNGARIAN BATTERY ASSOCIATION

Battery industry in Hungary

Rapidly developing battery industry

For more info please visit:
https://hipa.hu/main
Hungarian Investment Promotion Agency (HIPA)

Inzi Controls
Battery **module** production for EVs
Location: Komárom

SK Innovation
EV battery cell manufacturing
Location: Komárom, Iváncsa

Samsung SDI
EV battery cell manufacturing
Location: Göd

GS Yuasa
Lithium-ion battery, **traction batteries** & chargers, power supply systems
Location: Miskolc

JaeWon
Battery components manufacturing and **recycling**
Location: Komárom

CATL
EV battery cell manufacturing
Location: Debrecen

Dongwha
Electrolyte production and **NMP recycling**
Location: Sóskút

Toray -Zoltek
Separator films production required for lithium-ion batteries
Location: Nyergesújfalu

Bumchun
Aluminium jacks for electric car batteries
Location: Salgótarján

Doosan
Production of **copper** foil
Location: Tatabánya

Shinheung Sec
EV battery **pack components** manufacturing
Location: Monor

Lotte
Production of **aluminium** cathode foil
Location: Tatabánya

SungEel Hitech
Recycling of Li-ion battery materials
Location: Szigetszentmiklós

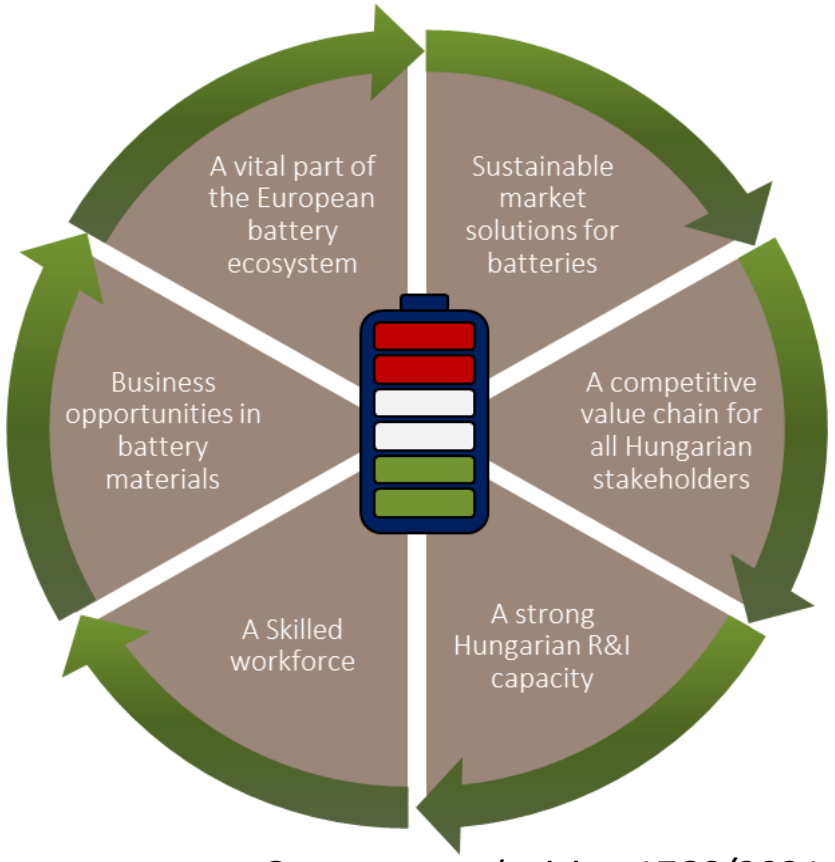
Soulbrain
Production of **electrolyte**
Location: Tatabánya

SEMCORP
Lithium-ion battery **separator** films
Location: Debrecen

HUNGARIAN BATTERY ASSOCIATION

…and much more

The Hungarian Battery Strategy is to provide future policy framework



Government decision 1766/2021 (X.29)
https://kormany.hu/dokumentumtar/nemzeti-akkumulator-iparagi-strategia-2030

HUNGARIAN BATTERY ASSOCIATION

The Strategy builds on earlier achievements to help Hungary grow into the center of the European battery value chain

1) by creating an environmentally and socially sustainable battery value chain:

- ✓ the environmental footprint of manufacturing processes can be reduced
- ✓ recycling capacities can be built

2) by developing a competitive national industry:

- ✓ shift from products “made in Hungary” to products “developed in Hungary”
- ✓ an organic value chain needs to be established with the participation of companies involved in working capital investments and domestic SMEs and research organizations
- ✓ domestic lithium-rich geothermal deposits need to be involved in the production of quality raw materials for battery production

- ✓ **Skilled workforce along the battery value chain**

HUBA supports the implementation of the government's battery strategy

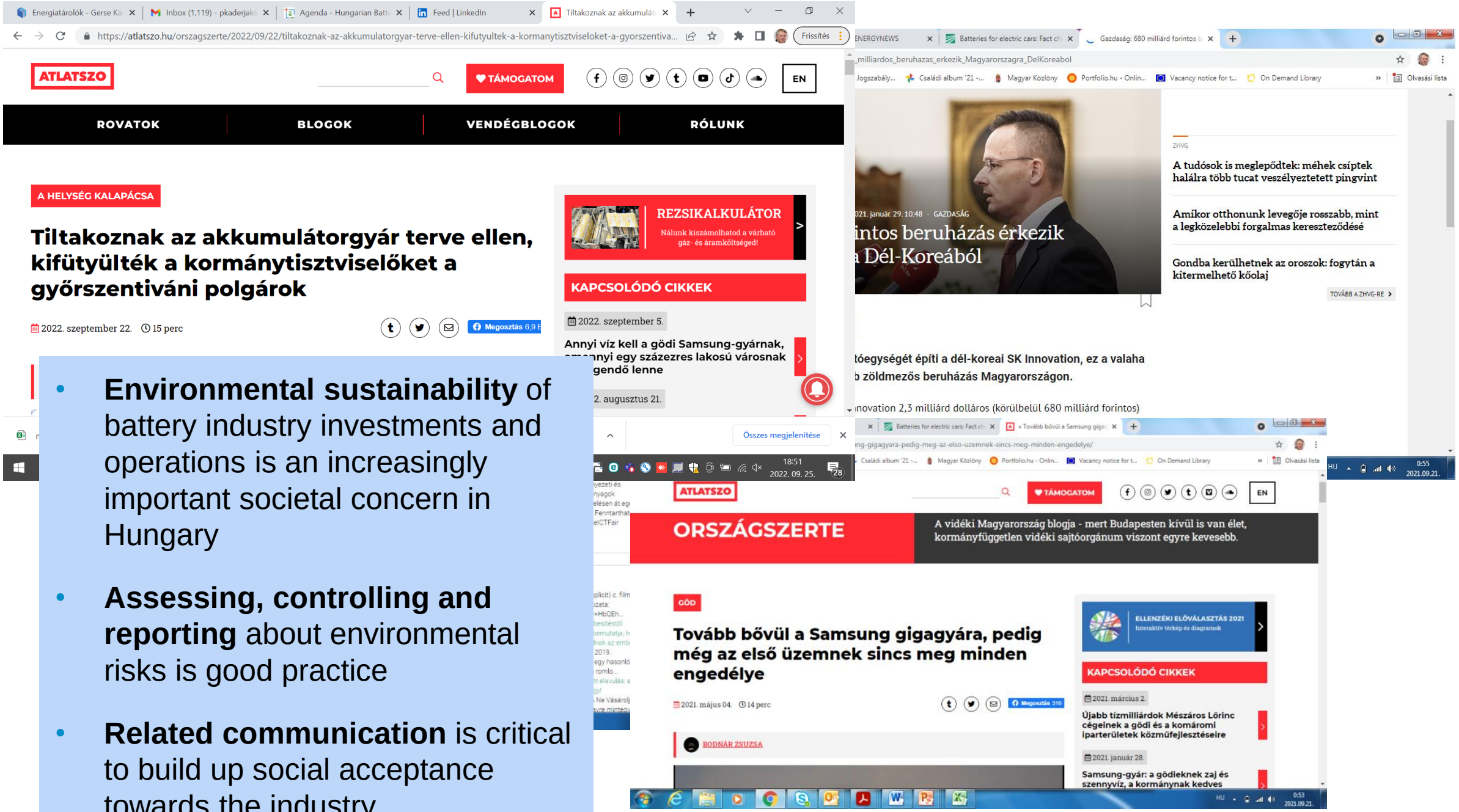
- Mission: to increase local value added
- Founded in December, 2021
- 63 members, more in pipeline
- Full EBA member
- Major activities: information exchange, networking, policy recommendations, training
- Battery Strategy implementation project package submitted to the government
- Working groups

HUNGARIAN BATTERY ASSOCIATION

HUBA working groups – in one sentence

R & D & I and training	Created in Hungary instead of made in Hungary
Manufacturers-suppliers	From giga-factories to a competitive, integrated industrial ecosystem
Grid storage	Winning the competition for increased electricity sector flexibility
E-Mobility	Creating cooperative & world-class automotive and battery industries in Hungary
Raw materials and recycling	Reducing import dependence on raw materials for battery production
Environment, healt, safety	Creating an environmentally and socially sustainable battery value chain

HUNGARIAN BATTERY ASSOCIATION



- **Environmental sustainability** of battery industry investments and operations is an increasingly important societal concern in Hungary
- **Assessing, controlling and reporting** about environmental risks is good practice
- **Related communication** is critical to build up social acceptance towards the industry

Net Zero objectives and batteries

Battery value chain development trends in Hungary

Environmental and social sustainability of the industry

HUNGARIAN BATTERY ASSOCIATION

Sustainability related challenges

- Controlling conventional pollutants
  - air, water and land emissions
- Natural resource conservation issues
  - water use, critical materials, waste management & recycling, energy conservation
- Decarbonisation
  - gradual reduction of Greenhouse Gas (GHG) emissions by 2050
- Social sustainability, health & safety issues

HUNGARIAN BATTERY ASSOCIATION

Sustainability related challenges

- Controlling conventional pollutants
  - „do as the Germans (Swedish) do” – level playing field
- Natural resource conservation issues
  - water use – innovative solutions (e.g. gray water)
  - critical materials, waste management – recycling and sustainable mining
  - energy – conservation and green energy Power Purchase Agreements
- Social sustainability, health & safety issues
  - independent monitoring, transparency & communication
  - strong and independent enforcement with civil society involvment

HUNGARIAN BATTERY ASSOCIATION

Thank you for your attention!

HUNGARIAN
BATTERY
ASSOCIATION