

# ELECTROMOBILITY IN CEE:

## CAN THE REGION MAINTAIN ITS COMPETITIVE EDGE?

EXCLUSIVE INTERVIEW with Péter Kaderják, Managing Director, Hungarian Battery Association

EXCLUSIVE INTERVIEW with Balázs Szilágyi, Head of Public Affairs in Europe, CATL

Q&A with major EV associations from CEE and beyond (IEA, AVERE, BEPA & more)

Special insights on the developing EU battery regulatory framework

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# Table of Contents


4 Message from the Editor-in-chief

5 In brief: highlights of the e-mobility industry in CEE

8 Facts & Figures

9 Interview with Balázs Szilágyi, Head of Public Affairs in Europe, CATL

11 Feature: The developing European regulatory framework for the battery industry

14 Q&A with Apostolos Petropoulos, Energy Modeller, International Energy Agency (IEA)

15 Q&A with Maciej Mazur, President of AVERE & CEO of the Polish Alternative Fuels Association (PSPA)

16 Analysis: Circularity of raw materials, a second life for batteries

19 Interview with Péter Kaderják, Managing Director, Hungarian Battery Association



# Table of Contents


21 Infographic: How will the EU battery regulation affect the batteries' components?

22 Q&A with Wouter IJzermans, Executive Director, Batteries European Partnership Association (BEPA)

23 Analysis: Emissions still rising: is the future of heavy-duty vehicles electric?

25 Q&A with Anela Karahasan, Secretary, Association for Electromobility, Bosnia and Herzegovina

26 Q&A with Patrik Krizansky, Director, Slovak Electric Vehicle Association (SEVA)

27 In summary

# MESSAGE FROM THE EDITOR-IN-CHIEF



Globally, electric car sales reached over 10 million in 2022, according to the International Energy Agency (IEA), up from approximately 6 million in 2021, a trend that is continuing in 2023 and is growing momentum in Central and Eastern Europe as well. Large OEMs are present in the region, with manufacturing plants spanning from Hungary to Poland, from Slovakia to the Czech Republic and following the global transformation of the automotive industry, they are all (faster or slower) switching to EV fleets.

But this revolution of the transport sector is not only about EV sales but the whole value chain, including the charging infrastructure, the batteries and their components and the regulatory framework around it.

Indeed, it took years for the EU battery regulatory framework to be adopted and now that it is here it will create a level of certainty for battery players, something that was very needed.

In this second e-book about the electromobility sector in CEE, we had a look at how the new developing regulatory framework is affecting players in the region, with exclusive interviews with Chinese battery manufacturer CATL and with the Hungarian Battery Association. You will also find insights from the major EV associations from the region and beyond and global and European perspectives provided by the IEA and AVERE.

But challenges remain, that's why we also considered the circularity aspect of the EU battery regulation, as recycling batteries and coming across raw materials is indeed one of the main obstacles, not just in CEE but worldwide. And the heavy-duty transport sector, CO2 emissions from heavy-duty vehicles have increased on average 2.2 per cent annually since 2000 and decarbonising this segment is also a global priority.

Many pieces of this puzzle still have to come together and I hope that you will make use of the insights included in this e-book to collect them and have a clearer view of where the sector is heading and what is our role in it.

Claudia Patricolo

Editor-in-chief

# In brief: highlights of the e-mobility industry in CEE

## IGNITIS ON INSTALLS 400 KW ELECTRIC VEHICLE CHARGING STATION

Lithuanian state-owned energy company Ignitis announced that its electromobility subsidiary Ignitis ON has installed the first 400 kilowatt (kW) electric vehicle (EV) charging station in the Baltic region, enabling EVs to be charged in around seven minutes.

Located in Vilnius, the charging station is suited for electric trucks due to its high power capacity. According to Ignitis's Head of EV Network Development Andrius Šeršniovas, "there is no doubt" that soon more EVs will be capable of utilising 400 kW charging stations. "This is our investment into future solutions, a step forward," he added.

The charging station can charge all EV models intended for the European Union market that have a fast-charging CCS (Combined Charging System) connector. Additionally, the station can charge two EVs simultaneously at 200 kW each.




## EU BATTERIES REGULATION ENTERS INTO FORCE

A new EU law aiming to expand battery collection, reuse and recycling in Europe entered into force earlier in August.

The new Batteries Regulation will aim to support the shift to a circular economy, increase security of supply for raw materials and energy and "enhance the EU's strategic autonomy," the European Commission said in a press release.

The new regulation is the first piece of EU legislation taking a full life-cycle approach in which sourcing, manufacturing, use and recycling are enshrined in a single law.

In around 24 months, the regulation will gradually introduce declaration requirements, performance classes and maximum limits on the carbon footprint of electric vehicles, light means of transport (such as e-bikes and scooters) and rechargeable industrial batteries.

From 2025, targets for recycling efficiency, material recovery and recycled content will also be "gradually introduced." All collected waste batteries will have to be recycled and high levels of recovery will have to be achieved, in particular critical raw materials such as cobalt, lithium and nickel.

According to the EU Commission, this will guarantee that valuable materials are recovered at the end of their useful life and brought back into the economy by adopting stricter targets for recycling efficiency and material recovery over time.

## ČEZ TO BUILD 40 NEW ULTRA-FAST CHARGING STATIONS FOR ELECTRIC VEHICLES

Czech utility group ČEZ remains the main developer of the country's public charging infrastructure for electromobility.

According to the company, more than 2.3 million kilowatt-hours (kWh) of clean electricity flowed from its charging points into car batteries between January and June, five times more than in the same period five years ago.

The charging speed for drivers at ČEZ is on average the fastest in the entire country, thanks to the highest output of the entire charging point network, which reached 36.3 megawatts (MW) at the end of June.

This is mainly thanks to the installation of new ultra-fast stations with outputs of up to 360 kilowatts (kW), where people can, for example, replenish the energy needed to travel from Prague to Brno in 10 minutes. ČEZ plans to build around 40 of these this year.



## OMV PETROM CONFIRMS EU FUNDING FOR REGIONAL DEVELOPMENT OF ULTRA-FAST EV RECHARGING POINTS

Romanian energy company OMV Petrom has received a confirmation of EU funding for the company's project to install more than 400 ultra-fast recharging points for electric vehicles (EV) in Romania, Slovakia and Hungary until November 2025.

The group of companies formed by OMV Petrom Marketing (OPM), OMV Hungária Ásványolj/OMV Hungária (OMV HU) and OMV Slovensko (OMV SK) have received approval for a European funding contract with the European Executive Agency for Climate, Infrastructure and the Environment (CINEA) for the ultra-fast charging infrastructure project. The financing contract was signed by CINEA and OPM, as a coordinator of the application.

The project aims to install more than 400 ultra-fast recharging points, each with an installed power of 150 kilowatts (kW), by the end of 2025. 328 points will be installed in 80 locations in Romania, 52 will be installed in 11 locations in Slovakia, and 28 will be installed in 7 locations in Hungary.

## ALEXELA ENTERS THE LATVIAN MARKET

Alexela, a leading energy company and green innovator in Estonia, has announced its expansion into the Latvian energy market, solidifying its commitment to providing sustainable energy solutions.

Marti Hääl, Chairman of the Board at Alexela, emphasised the strategic importance of this expansion. "Entering the Latvian market is a significant step for Alexela," he said. "We are dedicated to delivering high-quality energy solutions and establishing long-lasting partnerships in Latvia."

With this expansion, Alexela reaffirms its commitment to driving innovation and sustainability in the energy sector and looks forward to contributing positively to the Latvian energy landscape.

Alexela is offering a range of customised offers for corporate and private clients in Latvia. These offerings encompass both natural gas and electricity solutions, providing flexibility to suit varying business needs.

"As the energy sector continues its transformation from fossil to renewable energy resources, it has also contributed to a volatile market environment," added Māris Avotiņš, Country Manager of Alexela in Latvia. "We believe that the arrival of a new player in Latvia's energy sector and Alexela's one-stop-shop approach will be a positive signal to both home and business energy needs, contributing to more stable and predictable pricing options as well as stressless consumer-focused and tailored solutions."

# In brief: highlights of the e-mobility industry in CEE

## LITHUANIA EXPANDS ELECTRIC VEHICLE INFRASTRUCTURE BY 2030

“The development trends of electromobility show that 90 per cent of the cars we drive today will soon be in museums. From 2035, neither trucks nor cars with internal combustion engines will be sold in the European Union,” emphasised Lithuanian Minister of Energy Dainius Kreivys while opening the Electromobility Conference earlier in September.

In 2022, the number of electric cars in the EU increased by 58 per cent, and in the first half of this year, by 18 per cent. In Lithuania, the number of electric cars grew last year by a third and in the first half of this year, by another 25 per cent. The share of electric cars in the total vehicle fleet is slightly more than 16,000, including hybrid cars, surpassing Italy, Spain, Latvia, Estonia, Croatia, Greece, and the Balkan countries. The number of electric vehicles is expected to amount to 262 thousand by 2030.

“Of course, with such ambitious goals, we have a lot of work ahead of us. One of the main tasks is the development of the infrastructure for electric cars. We need 60 thousand public and private charging stations by 2030,” said the minister.

## EU COUNCIL ADOPTS RULES FOR EV RECHARGING AND HYDROGEN REFUELLING STATIONS

The EU Council has adopted, earlier in July, a final text of the alternative fuel infrastructure regulation (AFIR) on additional alternative fuel stations for light and heavy-duty vehicles.

“The new law is a milestone of our ‘Fit for 55’ policy providing for more public recharging capacity on the streets in cities and along the motorways across Europe.

We are optimistic that in the near future, citizens will be able to charge their electric cars as easily as they do today in traditional petrol stations,” said Raquel Sánchez Jiménez, Spanish Minister of Transport, Mobility and Urban Agenda.

From 2025 onwards, fast recharging stations of at least 150 kilowatts (kW) for electric vehicles (EV) will need to be installed every 60 km along the EU’s main transport corridors, ie. the Trans-European Transport (TEN-T) Network. In a proposal from the European Parliament, MEPs called for these charging stations to have an output of at least 400 kW.

In the same period, recharging stations for heavy-duty vehicles with a minimum output of 350kW will need to be deployed every 60 km along the TEN-T core network, and every 100 km on the larger TEN-T comprehensive network, with complete network coverage by 2030.




## ALEXELA UNVEILS 400 KW EV CHARGERS TO SPEED UP ESTONIA’S CHARGING INFRASTRUCTURE

Alexela is speeding up the development of Estonia’s charging infrastructure by installing 400 kilowatt (kW) superchargers. The charging speed of electric car chargers of such power is comparable to the filling time of liquid fuels. The first charger of this kind will be installed on the roadside of Via Baltica.

“The 400 kW superchargers are one of the most powerful EV chargers in the world, which is why their installation is extraordinary and unique not only in Estonia but in the entire region,” said Alan Vaht, Alexela’s head of e-mobility. “A charger of such power is faster than Tesla’s new V4 supercharger with its 350 kW, released just a few weeks ago.”

Considering that the batteries of electric cars currently on the market have an electric capacity of approximately 70 kilowatt-hours (kWh), a 400 kW charger makes it possible to charge an EV battery in less than 10 minutes. According to the intake capacity of the electric car, a 3-minute charging session can give the vehicle 100 kilometres of extra driving range. Such a charging speed is already comparable to the filling time of traditional liquid fuels.

## E.ON TO BUILD AND OPERATE MORE THAN 1,200 NEW FAST CHARGING POINTS IN GERMANY

E.ON has joined the Germany Network (Deutschlandnetz), after being awarded the contract to build and operate more than 1,200 new fast charging points at around 140 locations by the Ministry of Digital Affairs and Transport in Munich. In total, around 8,000 new charging points will be added to the existing charging infrastructure in Germany.

“Individual mobility is a valuable asset in a free society,” said Federal Minister Volker Wissing. “That is why I am pleased that, as the Federal Ministry of Transport, we are setting a milestone with the Deutschlandnetz, which guarantees users a reliably available range of fast charging options in Germany. With the Deutschlandnetz, we are complementing the expansion activities of the charging infrastructure operators in a meaningful and targeted way. Simple fast charging without gaps in the charging map will thus become a reality.”

“We are proud to have driven the development of the charging infrastructure in Germany from the very beginning and that E.ON will now also become one of the largest operators of the Deutschlandnetz,” said Patrick Lammers, Board Member for Customer Solutions at E.ON. “The aim is to have 15 million electric vehicles on German roads by 2030. To achieve this, we are committed to a rapid and unbureaucratic expansion of the charging infrastructure to meet the needs of users. We are convinced that this is the way to achieve the climate targets in the transport sector.”




## EBRD SUPPORTS PRISTINA’S FIRST ELECTRIC TAXI FLEET

Small and medium-sized enterprise (SME) Electric Mobility invested in becoming the first taxi company in Pristina, Kosovo, with the fleet consisting of only electric cars.

“Our company stands out for its commitment to sustainability and innovation,” said Fidan Hallaqi, founder and CEO of Electric Mobility. “We are proud to be the first electric taxi company in Kosovo.”

Electric Mobility’s investment was financed by a loan secured from the European Bank for Reconstruction and Development (EBRD) through Raiffeisen Leasing Kosovo, a local partner financial institution. Once Electric Mobility had carried out the investment, it received a 15 per cent cash-back grant from the European Union.

With support from the EBRD’s Advice for Small Businesses, the company has also developed a mobility-sharing platform to help digitalise all of its processes. The platform allows Electric Mobility to collect data about every journey and customer, track results and make changes on the go.

# In brief: highlights of the e-mobility industry in CEE

## HUNGARY LAUNCHES 156 MLN EUROS SCHEME TO PROMOTE ELECTRIC CARS

Hungary's Minister of Foreign Affairs and Trade, Péter Szijjártó, said, earlier in October, that the government will next month launch a 156.1 million euros scheme to promote the use of electric cars.

Speaking in Shenzhen, Minister Szijjártó said the program will involve the upgrade of the network of electric vehicle charging stations and government subsidies for the purchase of EVs.

"The government will spend 30 billion forints over the next two and a half years on building 170 new high-capacity charging stations along the busiest roads in Hungary," Mr Szijjártó said. "The other half of the scheme's budget will go towards grants for businesses such as sole proprietorships, taxi drivers and car-sharing companies that want to buy electric cars, minivans or pick-ups."

The Minister added that the ongoing revolutionary changes in the automotive sector, which he said represented the backbone of the global economy, also had a significant environmental protection aspect.



## NEW RULES ADOPTED TO STRENGTHEN CO2 EMISSION STANDARDS FOR HEAVY-DUTY VEHICLES

The EU Council has reached, earlier in October, an agreement on a proposal to update and strengthen the regulation on CO2 emission standards for heavy-duty vehicles. The aim of the proposal is to further reduce $CO_2$ emissions in the road transport sector and to introduce new targets for 2030, 2035 and 2040. The new rules will contribute to the EU achieving its ambitions to fight climate change.

"With today's agreement, we have reaffirmed our commitment to reach our ambitious climate targets," said Teresa Ribera Rodríguez, Spanish acting third vice-president of the government and minister for the ecological transition and the demographic challenge. "Lorries, buses and coaches are an important part of road transportation, affecting the daily lives of millions of citizens."

the Council maintained the targets set by the Commission. Besides the 2025 CO2 emissions reduction target of 15 per cent which was already provided for, the new rules introduce new targets: 45 per cent emissions reduction from 2030 (increased from 30 per cent); 65 per cent emissions reduction from 2035 and 90 per cent emissions reduction from 2040.

The proposed amendment also introduces a 100 per cent zero-emission target for urban buses by 2035, while setting an intermediate target of 85 per cent for this category by 2030.

## MOLDOVAN INFORMBUSINESS PRODUCES ITS FIRST ELECTRIC BUS

Moldovan transport company Informbusiness has completed the production of its first electric bus, making it the first electric bus domestically manufactured in Moldova.

The bus has a range of up to 70 kilometres and can be charged by the trolleybus network and special charging stations.

Attending an official presentation, held in the central Criuleni district near Chişinău, Moldovan Economic Development and Digitalisation Minister Dumitru Alaiba said that the government is looking to further support the producers who develop diverse branches of the economy.

"Due to your effort, the automotive industry gets a new breath and Moldova becomes a machine-producing country. Your success is the success of the entire country," he said.

Energy Minister Victor Parlicov stressed that about 35 per cent of all energy from Moldova is consumed by transport and the simplest way of decarbonising this sector is its electrification



## LG MAGNA E-POWERTRAIN ANNOUNCES NEW FACILITY IN HUNGARY TO SUPPORT CONTINUED GROWTH IN EV MARKET

LG Magna e-Powertrain, the joint venture (JV) between LG Electronics and Magna announced that it will build its first European production facility in Miskolc, Hungary, by investing 51.6 million euros. The project is set to create some 200 new jobs and it will produce e-motors, inverters and on-boarding chargers.

The investment will be the fourth plant of the company overall and its first one in Europe, with completion scheduled in 2025. Currently, CLG Magna e-Powertrain operates production facilities in Mexico, China and South Korea.

"Adding the new Hungary facility marks another milestone for the JV in executing its growth plan," said Diba Ilunga, president of Magna e-Powertrain. "With this new capacity – the JV's first in Europe – LG Magna e-Powertrain is well positioned to keep pace with customer demands and increases in global EV production."

## INNOVATION IS KEY FOR A FAIR COMPETITION WITH CHINESE ELECTRIC VEHICLES

The European Commission has formally launched an anti-subsidy investigation into the imports of battery electric vehicles (BEV) from China.

The investigation was first announced by the President of the Commission, Ursula von der Leyen during the State of the Union speech and it will determine whether BEV value chains in China benefit from illegal subsidisation and whether this subsidisation causes or threatens to cause economic injury to EU BEV producers.

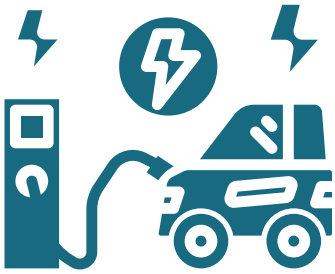
If both claims are proved to be true, the investigation will proceed and it will examine the possible consequences on importers, users and consumers of electric vehicles in Europe.

These numbers are indeed expected to rise as in 2022 EV sales in Europe increased by more than 15 per cent compared to 2021 (in other words, a total of 2.7 million EVs sold across the continent), as reported by the International Energy Agency (IEA). Europe is in fact the world's second-largest market for electric cars after China, accounting for 25 per cent of all electric car sales and 30 per cent of the global stock.

China itself has turned from a net importer into the world's largest exporter of cars. According to investment bank and financial services company UBS, BYD and other leading Chinese OEMs are set to dominate the global automotive market with high-tech, low-cost EVs for the masses, accelerating worldwide EV adoption. And even with growing trade barriers in mind, there is a sustainable approximately 25 per cent cost advantage for BYD over legacy competitors, bearing the potential to disrupt legacy OEMs on their home turfs.

# FACTS & FIGURES

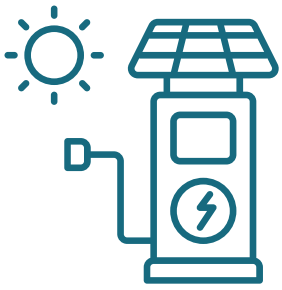
In **Europe**, the second largest market, **electric car sales** increased by over **15%** in 2022, meaning that more than one in every five cars sold was electric.



Global **lithium-ion battery production capacity** is expected to increase eightfold by 2027. **Poland** and **Hungary** account for as much as 9% of global production capacity.



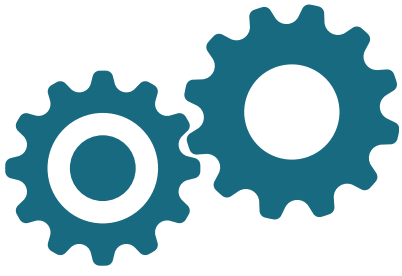
There are **more than 600,000 charging points** for electric vehicles (EVs) across Europe.



**Croatia, Lithuania, Turkey and Ukraine** are the only countries from Central and Eastern Europe to have joined the **Global MoU on Zero-Emission Medium- and HeavyDuty Vehicles,** through which signatories commit to work together to achieve 100% ZEV bus and truck sales by 2040, with an interim goal of 30% zero-emission vehicle sales by 2030,



As of March 2023, announcements on the planned **battery manufacturing capacity** delivered by 2030 are more than sufficient to **cover the demand for electric vehicles** in the Net Zero Emissions by 2050 Scenario.



*Data: International Energy Agency, Polish Alternative Fuels Association.*

# INTERVIEW WITH BALÁZS SZILÁGYI, HEAD OF PUBLIC AFFAIRS IN EUROPE, CATL

written by Claudia Patricolo, Editor-in-chief, CEENERGYNEWS



Balázs Szilágyi
Head of Public Affairs
in Europe, CATL

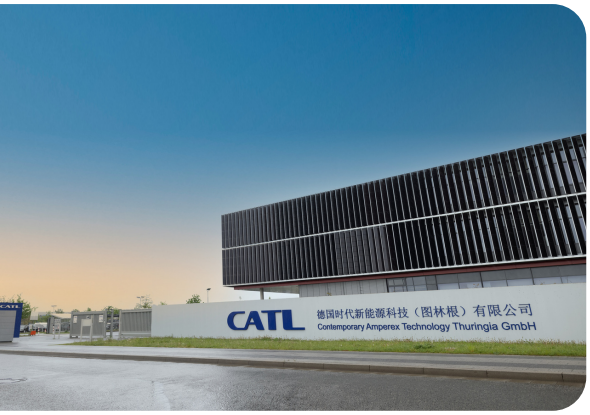
**Q: Overall, how important is the European market for CATL?**

A: CATL is a global leader in new energy solutions and our company has had several European clients for more than a decade. While the role of the European EV market is increasing, thanks to the European commitments to the green energy transition, we have been keeping our leading role of manufacturing EV batteries and Energy Storage Systems.

As Europe steps up its ambition to combat climate change, our German and our future Hungarian plants dovetail nicely with the EU's ambition and also mark a milestone in CATL's global journey. Our battery plant near Erfurt, in Germany, started operation in 2022 which was the start of moving its production closer to our customers. Our Debrecen plant will be our biggest factory in Europe, which will help our company respond to customers' needs in a timely manner.

**Q: CATL's factory in Arnstadt operates with the same technology as the one planned for Debrecen. What did the company learn from its first European experience that can be replicated in Hungary? What do you think will be the main differences, in terms of both challenges and opportunities?**

A: CATL uses the most advanced technology in both European factories. Our technology is focused on green manufacturing, green energy and green logistics based on industry 4.0 technology. Our goal is to replicate these experiences in Debrecen too and of course our company must comply with the regulations of the European Union both in Germany and Hungary. CATL strives for a close relationship with the local communities in both countries.




*CATL factory in Germany, photo courtesy of CATL.*

As a global organisation, CATL embraces the philosophy of thinking locally: in doing so CATL has significantly expanded its local footprint and contributions to the communities it operates in.

As a partner to the German Dual-Education-System, CATL offers dual studies in cooperation with German universities, contributes to the development of training programs for modern industry needs and supports a range of scholarships and internships. CATL is a main sponsor of the Thuringian basketball team "CATL Löwen" and has participated in reforestation projects to protect the woodlands of the Thuringian Forest. Together with local partner Baumpaten Thüringen, the company is planting 4.500 trees in 2023.

As we have been in Germany for a while, the local people can see how CATL operates, what our values are and how we support the community, so we have gained their trust. The social and economic differences between the two countries require certain adaptation of course.

**Q: Could you share with us more details on the current status of the plant, the next steps and the opportunities offered by the Hungarian market in particular?**

A: We have completed the ground levelling and the piling work in our Debrecen location by the end of September. Currently, we are building the superstructure of the factory, so our construction is developing according to the plans.

As Hungary is in the centre of Europe and home to many automotive enterprises, we believe that our company will be able to better respond to customer demands when the Debrecen plant starts production. In recent years, Hungary has also focused its economy on becoming a regional hub for battery manufacturing. We are also confident that the research and development opportunity Hungary has to offer can play a prominent role in the battery industry in the future.

# Exclusive interview

## with Balázs Szilágyi, Head of Public Affairs in Europe, CATL

**Q: What will be the environmental impact of the new plant in Debrecen?**

A: It is important to see that CATL has gained extensive experience from operating 13 production sites worldwide, which will ensure that in our Debrecen plant, no pollutants are released into the geological environment, air, surface water or groundwater. We are complying with the current

EU and Hungarian legislation to the highest extent and carrying out the operation within the framework of the official permits.

We are very proud that we have already achieved carbon neutrality in four of our battery plants. At this year's Shanghai Auto Show, we announced our plan to achieve carbon neutrality in our core operations by 2025. Our German and Yibin Plants have achieved 100 per cent green energy use in operations.

We will also optimise our energy consumption in Debrecen and will install on-site solar panels on our roofs. Our aim is to achieve carbon neutrality shortly after the start of our Debrecen operation.

**Q: How will CATL be affected by the new European battery regulation?**

A: CATL has closely followed the process of adoption of the new EU batteries regulation, we are still waiting for the secondary regulation. All in all, the new regulation makes batteries-related legislation more coherent and transparent. We welcome it and we are ready to take advantage and fulfil our new obligations.

**Q: According to some data, the demand for car batteries will outpace the forecast production. How is CATL, as one of the world's biggest battery makers, preparing to meet this growing demand, keeping up with competition and advancing technologies?**

A: CATL's expansion of production capacity closely follows the growth of demand.

Our company managed to become the world's leading battery manufacturer within a decade thanks to our core beliefs in strong strategic planning, constant innovation, and commitment to high quality.

We, as a company, believe that continual innovation is necessary in this fast-evolving industry. Therefore, we are always looking for solutions that help improve battery performance.

One of our latest products, the Shenxing LFP battery that we launched this August is a great example. Shenxing is the world's first 4C superfast charging LFP battery, capable of delivering 400 km of driving range with a 10-minute charge as well as a range of over 700 km on a single full charge, thus making advanced battery technology accessible for all. Following its announcement several OEMs including Chery, Neta and Avatr have announced Shenxing will be used in their EV models.

For high-end electric vehicles, we have launched Qilin batteries in 2022. With an energy density of up to 255 Wh/kg, it is capable of delivering a range of over 1,000 km in a breeze. Moreover, it adopts the latest high-safety protection technology of NP2.0, our latest safety protection solution that pioneers active isolation and decoupling of high-pressure and runaway flue gas. The innovative technology and excellent performance of the Qilin battery can bring our customers' high-end products to a new level. It has been used on multiple high-end EVs of renowned brands such as ZEEKR, AITO and Li Auto.

In addition to our devotion to product development, we also put high emphasis on advancing our manufacturing technology to effectively meet the growing demand globally. We have established an extreme manufacturing system architecture by introducing seven intelligent manufacturing technologies, such as AI, digital twin, edge computing and building an ecosystem with deep interaction of multiple platforms and systems. Our cell production defect rate has been improved from the PPM (part per million) level to the PPB (part per billion) level. We are now able to produce a cell in one second and a module in 20 seconds on average. According to the World Economic Forum, our two plants in Ningde and Sichuan are the only two Lighthouse factories in the battery industry globally, which demonstrates our leadership in applying Fourth Industrial Revolution technologies.

In terms of production capacity and delivery, we have mapped out a coordinated global production network at home and abroad. We already have established 11 production bases in China. Outside of China, our German factory started serial production of battery cells in December 2022. We also announced to build our second European factory in Hungary, which is expected to be completed in three years. Our efforts in sustainable development will also be one of our competitive edge. In April this year, we unveiled the CATL carbon neutrality plan: we aim to achieve carbon neutrality in our core operations by 2025 and across the battery value chain by 2035. It means, that in just two years, all of our battery factories will be transformed into "zero-carbon factories," and in twelve years, all of our batteries themselves will be "zero-carbon". So far we have achieved carbon neutrality in four of our factories.



# The developing European regulatory framework for the battery industry

written by Claudia Patricolo, Editor-in-chief, CEENERGYNEWS



# THE DEVELOPING EUROPEAN REGULATORY FRAMEWORK FOR THE BATTERY INDUSTRY

**In August 2023, the European Battery Regulation entered into force, replacing the old directive from 2006. Why now? Of course, among the drivers is the exponential growth of electric vehicles (EVs), which in 2022 accounted for over 1.3 million vehicles sold in the European Union.**

Secondly, one might say that the EU needed to level the playing field with the United States after the adoption of the Inflation Reduction Act (IRA) which, in just over a year has been followed by more than 110 billion US dollars in clean energy investments, with just over 70 billion US dollars earmarked for the US battery supply chain, particularly downstream cell projects (so-called gigafactories).

Finally, due to the advancement of technologies, the increased usage of different types of batteries from the consumers' side and the growing competition, the old directive had become obsolete and needed to be replaced to be more in line with the times.

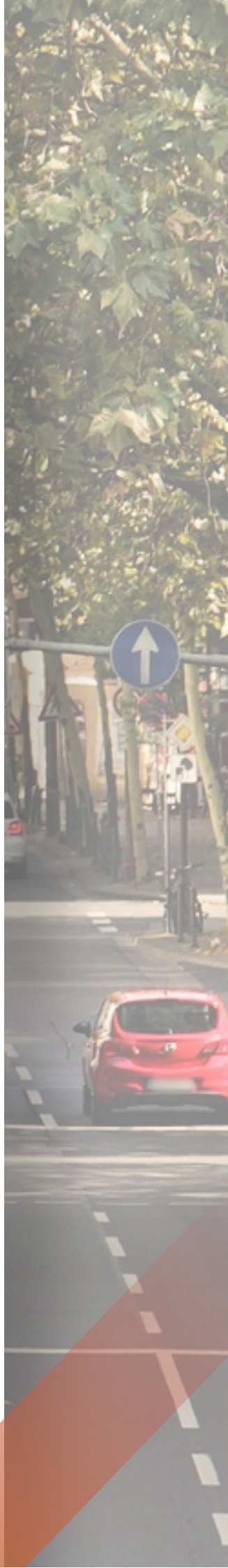
**Taking into account the whole battery value chain**

The old directive didn't differentiate the types of batteries, both in terms of composition and end-use. Now, with the overall objective of minimising the harmful effects of batteries on the environment, the new regulation will cover the entire lithium battery life cycle. It is the first time that the whole process, from extraction of the raw material to production, design, labelling, traceability, collection, recycling and reuse is taken into consideration.

"As a regulation, it will be implemented directly into the legislation of every Member State and this will help to promote a level playing field among them," comments Pau Sanchis, Senior Policy Manager at EUROBAT, the Association of European Automotive and Industrial Battery Manufacturers. "One of its main advantages is that it covers the entire life cycle of a battery, from mining to recycling. It is a product-specific legislation."

"We now have the legislative framework to produce the most sustainable and greenest batteries in the world, setting a standard for all other jurisdictions," Mr Sanchis tells CEENERGYNEWS. "However, the high level of complexity in the provisions means that the exact interpretation of several mandates and obligations will need to be agreed upon in secondary legislation."

As one of the main players in the CEE region, Chinese battery manufacturer CATL believes that energy transition will become an increasing priority for all economies.



# The developing European regulatory framework for the battery industry

"We are confident that this will facilitate the sustainable operation and production of cars and their batteries, as well as the spread of electric vehicles," Balázs Szilágyi, CATL's Head of Public Affairs in Europe tells CEENERGYNEWS. "CATL is also actively exploring the path to carbon neutrality during the full life cycle of batteries. For example, we have carried out nearly 140 sessions of carbon footprint training for upstream partners. We have also created CREDIT, the first audit toolkit in the industry for the lithium-ion battery supply chain. As the industry is constantly evolving, we strive to apply modern solutions in manufacturing and throughout the supply chain."

**What all the players are thinking about: how to calculate the carbon footprint**

So, how does the new regulation work? First of all, beginning May 2026, batteries above 2 kilowatt-hours (kWh) placed in the Union market will be required to be electronically registered. This will be in the form of a Battery Passport carrying an identification QR Code and CE label that will ensure compliance with the safety and traceability requirements. Also, from May 2024, every battery must be equipped with a Battery Management System (BMS), which can estimate the battery's State of Charge and State of Health.

An important aspect is the one related to the assessment of the batteries' carbon footprint as the regulation introduced a number of rules and methods for quantifying it. And it is exactly this approach that is extended to the batteries' entire life cycle. It begins with the origin of the raw materials and their extraction, takes into account their transport and processing and also maps out the global impact of post-production activities.

Specifically, when it comes to CEE, in Hungary and Poland, currently the two countries where most of the (non-European) battery factories are located, the carbon footprint is 76 and 109 grams of CO2 equivalent per kilowatt-hour (CO2e/kWh) respectively. Thus, if we think about the fact that producing a battery in Sweden would result in a lower carbon footprint, some might fear that CEE countries might lose their competitive advantages, against all the investments of the past years.

"This is something that the European Commission is working on, the development of the methodology to calculate the carbon footprint for EV batteries," states Mr Sanchis.

> ***This is crucial for the industry and all the batteries need to abide by the same requirements. So far, we know that it will be applicable to industrial batteries (above 2 kWh), EV and LMT batteries, but with different timelines and with an staged approach: first declaration of the carbon footprint, then performance classes and lastly maximum thresholds.***

However, it is not just to abide by the regulation but also to keep in line with the ambitious targets Europe has set to become the first climate-neutral continent by 2050, that companies investing in these industries have to take into account the sustainability aspect. And indeed they are.

CATL, with 13 production sites around the world is said to have extensive experience in the design and operation of battery plants to ensure continuous progress in sustainable development in its plants across the globe.

"At this year's Shanghai auto show, we have announced to achieve carbon neutrality in core operations by 2025, which means all of CATL's battery factories will become carbon neutral by 2025," Mr Szilágyi says. "In fact, our German and Yibin Plant have achieved 100 per cent green energy use in operations. Through innovation and practice in green energy, green manufacturing and green logistics, CATL has built up a wealth of valuable experience in green development. [...] So far we have achieved carbon neutrality in four of our battery plants. In the future, CATL will replicate these plants' zero carbon experiences in the Debrecen plant to reduce carbon footprint, thus contributing to the development of sustainable production."

As part of its commitment to reducing the carbon footprint in battery manufacturing, CATL also plans to build its own green power supply on and off the site in Debrecen too.

"We will install on-site PVs with a capacity of about 18 megawatts (MW) on our roofs," explains Mr Szilágyi. "With regard to off-site PV, we have a variety of solutions, which can be purchased from PPA companies, constructed independently or in cooperation with other investors. The goal for the Debrecen plant is to become carbon neutral shortly after it starts its operation too."

**Valuable secondary materials contained in batteries: the circularity clause of the regulation**

Finally, the European Battery Regulation also aims at promoting the circular economy along the entire battery life cycle and to do this, it has set out end-of-life requirements, including targets and obligations regarding material and waste battery recovery by manufacturers. First of all, batteries cannot be discarded as unsorted municipal waste, as it was with the old directive, but, instead, must be collected separately as WEEE (waste electrical and electronic equipment) by specialised centres.



# The developing European regulatory framework for the battery industry

"We have been evaluating the effect of the new regulation on our operations," Mr Szilágyi says. "We are glad to be part of the circular economy and have developed all the cutting-edge technology to implement the new regulations in practice."

The collection target for portable batteries should go from the current 45 per cent of the market to 70 per cent by 2030. According to the European Association of National Collection Schemes for Batteries (Eucobat), these new targets are unrealistic, as in a market like lithium-ion batteries that grows very quickly year after year, this leads to collection targets that are higher than the volume of batteries consumers actually disposes of for collection and recycling.

"Regarding the targets for lithium recovery from waste batteries [50 per cent by the end of 2027 and 80 per cent by the end of 2031]," points out Pau Sanchis, "it is true that they are very high. However, given the context and the significant dependency on third markets, those thresholds are to be seen as an attempt to avoid raw material leakages towards other non-EU jurisdictions. For now, we are waiting for the Commission to produce the Delegated Act establishing the methodology for material recovery. As with many things in life, the devil is in the details."

Another aspect to take into account is the fact that most of the critical materials are produced elsewhere (see the infographic at page 23) but they are not available everywhere. To compensate for this shortage, the regulation has set a required minimum percentage amount of minerals coming from recycling that batteries in several categories must contain.

Also, Mr Szilágyi mentions that end-of-life batteries contain a lot of valuable secondary materials and are therefore highly recyclable.

"The recovery technology is available to CATL, with the aim of recovering as much of the secondary materials as possible, thus improving both the efficiency and sustainability of the manufacturing process," he underlines.

"Supported by our subsidiary Brunp, CATL has developed a world-leading ability to recycle valuable metals in retired batteries. By upgrading the process technology, iterating the separation and purification system and improving the standard of equipment automation, we have achieved recovery efficiency of 99.3 per cent for nickel, cobalt and manganese and 90 per cent for lithium," he continues. "In 2022, we recycled 101,200 tons of battery waste and reproduced 13,600 tons of lithium carbonate out of it."

So the final question is: can the new regulation really make Europe more competitive and the preferred choice for investments?

For Mr Sanchis yes, but there is still a lot to be done as the regulation comes with more than 50 pieces of secondary legislation that are going to have a clear impact on how this legislative framework is going to be implemented, "ranging from raw material sourcing and battery design to manufacturing processes, recycling and reuse."



*Visual plan of the future CATL plant in Debrecen, courtesy of CATL.*




# Q&A WITH APOSTOLOS PETROPOULOS, ENERGY MODELLER, INTERNATIONAL ENERGY AGENCY (IEA)

Apostolos Petropoulos
Energy Modeller
International Energy Agency (IEA)

**Q: What are the major trends we can observe in the electromobility industry worldwide? Are we on track to reach a net-zero emission scenario by 2050?**

A: Electric vehicles (EVs) are pivotal in the effort to decarbonise the road sector, which is responsible for approximately 15 per cent of global energy-related emissions. Major car markets have taken the lead in electric car sales: more than one in four cars sold in China, over one in five in the European Union and nearly one in ten in the United States were electric in 2022. Globally, electric car sales reached over 10 million in 2022; up from approximately 6 million in 2021. This trend continues into 2023, with monthly EV sales equal to the sales from the entire year of 2017. Beyond cars, urban buses and two/three wheelers are also following a similar trajectory, especially in emerging markets and developing economies. If the growth observed over the past two years persists, we are on track to meet the requirements for passenger cars to align with the Net Zero Emissions by 2050 (NZE) Scenario. However, this trend must be accompanied by efforts to decarbonise the power sector, which plays a crucial role in providing low-carbon electricity for charging EVs. Additionally, new low-carbon technologies are necessary for reducing emissions from building and industrial sectors.

**Q: National policies and incentives are definitely boosting the sales of EVs and are helping to decarbonise the transport sector. What can still be recommended to create a major shift in this direction especially in CEE?**

A: In my view, policies play a crucial role in shaping the future of electromobility. Recent examples include the Inflation Reduction Act (IRA) in the USA which has contributed to driving up electric car sales over the last twelve months. On the legislative side, measures such as CO2 standards adopted by the EU or ZEV mandates applied in California are key levers for promoting electromobility. In parallel, investment in public charging infrastructure is crucial for alleviating consumers' range anxiety. Another area that should not be overlooked is grid enhancement. Grid systems are vital for providing adequate and uninterrupted electricity to consumers. Electrification is a "no-regret" option for achieving climate goals and both automobile and battery industries have moved fast in this race. The announced battery manufacturing capacity for 2030 is sufficient to cover the future battery demand from EVs in the NZE scenario. Although Central and Eastern European Countries lag behind large car markets in the adoption of EVs, the future reduction in battery costs and the availability of more affordable EV models could be a game-changer in the region. Electromobility will also create new opportunities for the region, particularly in countries with a high-level skilled labour force, to attract investment in battery plants and EV production facilities.



# Q&A WITH MACIEJ MAZUR, PRESIDENT OF AVERE, CEO OF THE POLISH ALTERNATIVE FUELS ASSOCIATION (PSPA)

Maciej Mazur
President, AVERE & CEO, Polish Alternative Fuels Association (PSPA)

**Q: From a European perspective, what are the biggest opportunities and challenges for the electromobility industry in the next 12 months – and how could these challenges and opportunities impact Central and Eastern Europe?**

A: As transport is the source of 24 per cent of European CO2 emissions, where 70 per cent of that is road transport, electromobility and its aligned industries can play a key role in supporting this process. This, however, will be strongly based on driving innovation and actually establishing manufacturing plants on the Old Continent. For the CEE region, this carries additional significance because of its delayed status in terms of decarbonising transport and the economy in general. With the Chinese global leadership in terms of electromobility and other very important factors like the US IRA, Europe must focus its efforts on achieving competitiveness in this context. For the CEE, this is a double challenge, because Western and Northern EU States are already much more attractive for green investments, also due to the access to low-emission or fully renewable energy. For the CEE this is a problem related to its ongoing effort of reducing coal in the energy mix of the countries of this region. Further challenges arise with the effects of the atrocities of the Russian invasion of Ukraine on the energy, financial and industrial markets, as well as other disrupting global issues. [...] The entire zero-emission transport industry emphasises these challenges are also opportunities for economic and social development. New investments will bring new jobs and drive economic innovation, which will also foster competitiveness for the region and for the EU. In the context of the next 12 months, this entire set-up encounters additional challenges because of the EU elections and the approaching new term of the European Commission. The ecosystem of stakeholders involved in new mobility must really accelerate its work and for the CEE this is also true, but at double the pace.

**Q: Looking specifically at Poland, what could the country's private and public sector leadership do to seize on the above opportunities and respond to the upcoming challenges?**

Poland has recently seen its parliamentary elections, which also means a change in government. At this point, it's not yet possible to definitively tell what exactly this new government will pursue, but most observers expect that Poland will be more enthusiastic towards zero emission transport and decarbonisation efforts. As PSPA has shown, if the key market players join their efforts, then electromobility and its aligned industries can generate as much as 5 per cent of the Polish GDP by the end of the current decade. With the tools presented by the legislation acts of the Fit for 55 package and the available market potential of the 6th EU economy that Poland currently is, those goals seem highly achievable. Already in 2023, nearly 3 per cent of the Polish annual export value is generated by the lithium-ion battery industry. The opportunities seem clear and we have the means to exploit them, but we have to be mindful not to miss this chance. As 2024 nears, Poland is close to this situation and hence, the change of government and the possibility of a joint effort from private stakeholders, local government and the central administration – with a bit of support of experts and NGO's – will surely mitigate those risks.

# Circularity of raw materials, a second life for batteries

written by Filip Derewenda, Journalist, CEENERGYNEWS



# CIRCULARITY OF RAW MATERIALS, A SECOND LIFE FOR BATTERIES

**In 2020, the EU added lithium to its list of critical raw materials amid increased demand for lithium-ion batteries in electric vehicle (EV) production and high import resilience from China. Last winter's energy crisis demonstrated the green transition's ability to not only respond to the climate emergency but also strategically bolster energy security. As Europe seeks strategic autonomy in lithium supply, the green transition's circular economy model may once again provide the EU with the strategic tools it needs.**

### Assessing the legislative landscape

On the legislative front, 2023 has been a breakthrough year for implementing circular solutions for Europe's EV industry. In August, the first piece of EU legislation (EU Battery Directive) with a full life-cycle approach to sourcing, manufacturing, use and recycling of lithium-ion enshrined in a single law entered into force. In less than two years, the new legislation is set to introduce minimum requirements for recycling efficiency, material recovery and recycled content in EVs, light means of transport and rechargeable industrial batteries.

The directive is an "encouraging step" towards the creation of a domestic circular supply chain, says Dr Christian Marston, COO of Altilium, a UK-based EV battery company, with a regional presence in Bulgaria.

"The introduction of minimum requirements will result in lower carbon emissions for EVs produced in Europe and less reliance on international supply chains," he tells CEENERGYNEWS.

"We expect this will lead to a 'green premium' for recycled battery materials, especially as the market is likely to struggle to meet some of these targets for recycled content," Altilium's COO notes. "Targets for recycling efficiency are also an important development for the industry, especially for lithium. Achieving the lithium recovery target will require significant investment in hydrometallurgical processes, such as those being developed by Altilium, as opposed to the pyrometallurgical recycling currently employed by most European recyclers."

The hydrometallurgical processes involve metal recovery by combining water, oxygen and other chemical reagents with or without the use of a pressurised environment. "There is a range of activities ongoing that can support new battery recycling technologies, including hydrometallurgical processes, to support our goals in the area of EV recycling," a European Commission official tells us about the bloc's policy in this area.

# Circularity of raw materials, a second life for batteries

Notably, the “Batt4EU Partnership” under Horizon Europe has allocated funding for projects related to sustainable recycling processes, including hydrometallurgy.

CEO Felix Paul Wagner and CTO Jan Born, co-founders of German circular EV technology company Circunomics, in which Polish energy group ORLEN is an investor, highlight that “a true circular economy” includes both recycling and second-life/ re-use.

> ***Therefore, in addition, I would like to see targets on re-use here in the EU. In China, the OEMs [original equipment manufacturers] have to test the batteries first. If they are still usable, they have to reuse them instead of recycle them. This is good practice!, Mr Wagner and Mr Born tell CEENERGYNEWS.***

Looking deeper into the new EU battery regulation, Dr Marston believes that the EU should ban the export of black mass, which, as he says, would ensure that these valuable raw materials remain in Europe’s domestic supply chain.

In terms of black mass, the EU Commission points to a targeted amendment of the List of Waste in the Batteries Regulation and the Communication on Critical Raw Materials.

From 2024, the amendment would aim to improve the identification and classification of relevant waste streams arising from the production of batteries and from their recycling (including black mass from different types of batteries).

The European Commission's Joint Research Centre (JRC) is currently working on a report, due in the first quarter of 2024, that will support the Commission's proposal to make a targeted amendment to the List of Waste. It will identify specific waste streams and determine whether, generally, they are hazardous or non-hazardous waste, the EU official adds.

**The situation ‘on the ground’**

Despite robust - and perhaps optimistic - legislative action in the past few months, a lack of necessary infrastructure appears to be a major obstacle in Europe’s circular ambitions.

“Recycling EV batteries at scale requires large scale infrastructure, particularly for processing black mass, which contains the critical battery materials, such as lithium,” Dr Marston notes.

“Incumbent pyrometallurgical recycling technologies are unable to recover lithium. Only hydrometallurgical processes can recover lithium at recovery rates set under new EU legislation.

Currently, there is a lack of this hydrometallurgical processing capacity in Europe but Altilium has plans for two such facilities, in the UK and Eastern Europe,” Dr Marston.

The gaps in infrastructure are particularly visible when it comes to black mass, Dr Marston highlights. “We are seeing more recyclers dismantling and shredding batteries in the UK and Europe, but most only go as far as producing black mass, which is then exported to Asia. We need to build the infrastructure in Europe to process black mass, in order to build a sustainable domestic supply chain.”

When thinking about a potential response to this growing challenge, the role of both private and public stakeholders naturally comes to mind. On this point, Dr Marston references the key role of public investments in the United States to de-risk these projects, attracting private capital in the process.

The US Inflation Reduction Act (IRA) contains a provision that automatically designates EV battery materials recycled within the country as domestically produced for subsidy purposes, irrespective of their source. As a result, companies utilising recycled battery materials in the US become eligible for incentives in their EV manufacturing processes.

"Simply act and make it work,” say Circunomics’s Co-Founders when asked about the needed solutions going forward. “Of course, we need more regulations, but in battery circularity in particular.

Here lays a considerable amount of value for the OEMs. Once they understand this, I'm sure they will follow our approach. Simply shouting for more regulations is too basic from my point of view."




*Photo courtesy of Altilium.*

# Circularity of raw materials, a second life for batteries

**Can Poland and Hungary capitalise on Europe's circular pivot?**

As seen above, big changes are ahead – or are already taking place. The pivot towards circularity may also present a strategic opportunity for countries across Central and Eastern Europe to strengthen their competitiveness. "Poland and Hungary are likely to be important markets, given the investment in gigafactories in both countries. Altilium sees Central and Eastern Europe as having huge strategic importance and we will begin recycling EV batteries in the region in 2024," Dr Marston tells CEENERGYNEWS.

Poland, in particular, has been at the forefront of attracting capital for its EV recycling capacity. In January, the European Bank for Reconstruction and Development (EBRD) announced a 120-million-euro loan for the construction of a greenfield recycling facility in southern Poland for the extraction of rare metals from automotive waste, EV batteries and other e-waste.

Developed by Polish recycling company Elemental Holding, the facility is planned to be completed by the end of this year. Once operational, it will recycle production scrap and end-of-life lithium-ion batteries (LiBs) from EVs and other electronic devices including smartphones or laptops, as well as platinum group metals (PGMs) from automotive waste.

It is also worth noting that Elemental Holding is financially backed by the Joint Initiative on Circular Economy (JICE). Under the guise of the EU's European Investment Bank (EIB), JICE provides long-term financing for projects related to the circular economy, with Poland's Bank Gospodarstwa Krajowego among its participating partners.

As Dr Marston points out, Poland and Hungary are leading the region when it comes to EV battery investments – especially when considering that Poland is home to the biggest lithium-ion battery factory in Europe (LG Energy Solution) and Hungary's construction of a 100-gigawatt hours (GWh) battery plant by Chinese CATL, planned to be completed by 2025.

Looking at other regional developments, Belgian company Avesta Battery & Energy Engineering announced earlier this year plans to build a 22 GWh battery plant in Romania. In August, Korean LG Energy Solution (LGES) announced its first battery recycling joint venture with Huayou Recycling, a subsidiary of Chinese Huayou Cobalt. With the planned start of operations in late 2024, battery scrap generated from the LGES Nanjing facility and waste batteries collected by Huayou Recycling will be delivered to the joint venture company to produce recycled metals, including nickel, cobalt and lithium.

It will be interesting to see the future shape of LGES's EV recycling portfolio - and whether the company's facility in southwestern Poland will become a beneficiary of the circular revolution. Looking at today's EV recycling environment – Central and Eastern Europe, in particular countries like Poland, Hungary and Romania are clearly generating key investor interest in this area. Complemented by a strong political appetite from Brussels, the region seems to be on the right track to aid Europe's strategic circular pivot.




*Photo courtesy of Altilium.*

# INTERVIEW WITH PÉTER KADERJÁK, MANAGING DIRECTOR, HUNGARIAN BATTERY ASSOCIATION

written by Claudia Patricolo, Editor-in-chief, CEENERGYNEWS

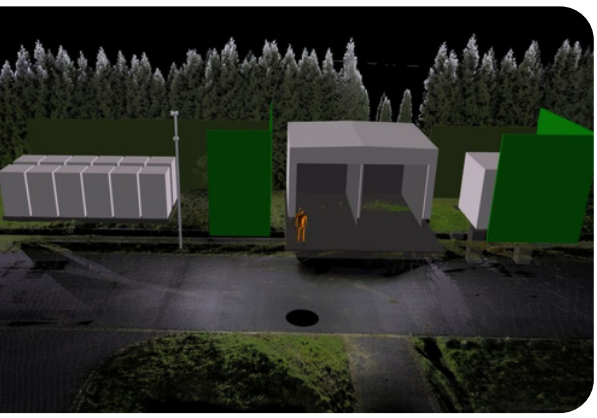


Péter Kaderják
Managing Director,
Hungarian Battery Association

**Q. Overall, what do you think are the main advantages of the new regulation? On the contrary, what challenges still remain and delegated acts?**

A. We have welcomed the new regulation after all the years of regulatory work. It will create a level of certainty for battery players which is something very needed. However, because we still have to wait for implementing acts and additional regulations from the Commission's side, there are still some uncertainties. The most important aspect is that it will help move the European battery industry towards a sustainable path. And it is especially true for Hungary where major investments are taking place by foreign investors, especially from Korea, China and Japan. This regulation is important to inform investors of the conditions in which they will operate.

Still, there is work to be done, it is a learning process. In fact, the Hungarian Battery Association is planning to create some workshops and trainings to assist in this learning process, trying to be active in supporting our members (which currently account for 78). But it is not just the battery regulation that will define this industry, but the whole package of regulation part of the Green Deal and the Fit-for-55, like for example the AFIR regulation which will definitely impact the EV industry and the battery one as well. Furthermore, this sector will receive additional support as part of the Net Zero Industrial Plan proposed by the Commission. Finally, I would like to mention the Critical Raw Material Act with its specific targets. So we have a significant body of regulation that must be finalised and there is still a lot of work to do. In Hungary it is important to emphasise that European policies are not only about using green energy solutions but also for an industry that serves the green transition and the battery industry should be considered as a key sector.



*ALTEO's project: Integration of storage facility built with battery cells of various parameters into the electricity system.*

**Q. Focusing on recycling and second-life/ re-use, for example, in China, the OEMs have to test the batteries first. If they are still usable, they have to reuse them instead of recycle them. Is this a practice we can adopt here as well?**

A: Absolutely yes, it is something we should use more in Europe as well. EV batteries are designed in a way to serve the full lifetime cycle of cars. Even after that, batteries still have 80 per cent of the original capacity to store electricity, so at the end of this first life we have the opportunity of additional years of usage. Second-life applications can take the form of containers, energy storage for households and so on. In Hungary, we have some ongoing projects, like the one. Carried out by Alteo, one of our members, who built a grid-scale battery storage facility (5 MWh) partly composed of used car batteries and it is already in operation in Hungary. I have seen similar applications also in Austria, so it is becoming a growing business especially now that the first wave of electric cars will finish the first life cycle.

The big question is: how can we ensure that used batteries are safely applied in the new applications? Because the safety standards of taking out batteries, testing them, removing damaged components and making sure that they operate safely in a new environment, is not a fully regulated process and it is important to build the testing capacity of used batteries and have entrepreneurs that develop innovate ways to reuse these batteries. In Europe, we have several enterprises working on this and in Hungary there are some actual applications not only using batteries from passenger cars but also from buses, as in Hungary we have had this very successful green bus programme.

# Exclusive interview

**with Péter Kaderják, Managing Director, Hungarian Battery Association**

**Q. Regarding the carbon footprint aspect, when it comes to CEE, how can countries like Hungary and Poland remain competitive in this market? What an upcoming delegated act should include to create a real level-playing field?**

A: Investors in this country are very well aware of the sustainability requirements of batteries because they are suppliers of big OEMs like BMW, Mercedes and Audi and these already require them to become carbon neutral and to use only green electricity. So Asian investors in Hungary not only face the pressure of battery regulation but especially of their clients and buyers to carry out their operations in a climate-neutral and environmentally friendly way. Sunwoda, for example, already plans to use 100 per cent green energy in the operation of its battery plant in Nyíregyháza, bringing down the carbon footprint of their production. So, it is also a very nice opportunity for green electricity operators and green energy investors, because new solar, new wind and new geothermal units will be required.

**Q. Speaking of competition, what is the role of both private and public stakeholders and how can it be further developed? For example, the US Inflation Reduction Act contains a provision that automatically designates EV battery materials recycled within the country as domestically produced for subsidy purposes, irrespective of their source.**

A: The IRA and follow-up actions in the US created a very tough and competitive position for Europe to be the home of green technologies. Actually, subsidies can only be offered if EVs and components are produced in the US which creates a trade barrier and it is not competitive friendly. However, Europe presented the Net Zero Industrial Plan as a response, opening up the possibility for Member States to provide subsidies to green technology producers and component producers who decide to settle down in Europe. It is great news the Member States can legally use state aid to promote new investments in these green and industrial areas.

For example, Hungry provided some subsidies to Samsung's factory in Győr and there was an investigation on the legality of the subsidies which were then approved by the EU, even according to former rules. So now, these new efforts are trying to further promote this kind of incentives in order to convince investors to invest closer to Brussels, maybe in Debrecen, instead of Houston. More recently, the European Commission has approved a 2.36 billion euro scheme for accelerated investments in strategic sectors in Hungary, including batteries. So it is a significant sum and a big opportunity to continue bringing investors to Hungary not only in the battery industry but also for the production of solar panels, heat pumps, wind turbines and so on.

**Q. What are the biggest opportunities and challenges for the electromobility industry in the next 12 months for the Hungarian EV industry – and what steps ought to be taken to seize such opportunities and respond to the challenges?**

A: The automotive sector is a key industry for the Hungarian economy. Two years ago maybe the question was if Hungary would be able to keep it after the transition from ICE to EVs. Now we are on a good track to keep not only the automotive industry already in place but also to attract those investments that can help this transition. Like BMW's factory in Debrecen to which many of the battery investments are also related, but also Audi in Győr, Mercedes started to electrify its production in Kecskemét, Ikarus is producing and exporting electric buses to Poland and many other examples could be made.

This transformation of the car industry is very promising and it was also possible because of the investments in the battery industry value chain. Maybe also Chinese carmakers will arrive in Hungary or Suzuki will start electrifying its European production. Hungary became sort of a hub for the electric vehicles manufacturing industry as we have premium European OEMs combined with Asian batteries and battery parts producers which I think is a very competitive combination. The popularity of EVs is also increasing all over Europe. It is not the politicisation of the topic (like the argument to ban ICE cars by 2035) but the consumers who like EVs, so we have to follow the market and Hungary is in a very good position. Now the task is to ensure that the large amount of investments in battery production that will take place in Hungary are sustainable, both from an environmental point of view and a social point of view, keeping the people and the workers safe.



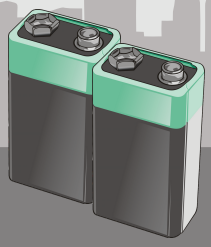

*Ikarus electric buses in Hungary.*

# How will the EU battery regulation affect the batteries' components?

**Certain substances present in batteries, such as cobalt, lead, lithium or nickel, are acquired from scarce resources which are not easily available in the European Union and some are considered critical raw materials by the European Commission.**

**By the end of 2025, it will be mandatory to recycle 65 per cent of the average weight of lithium-based batteries, to be increased up to 70 per cent by 2030.**







**Lithium-ion batteries, the kind that power almost all EVs, use the following "critical minerals":**

**GRAPHITE** Mainly produced in **China**, Mozambique, Madagascar. About 8% of global natural graphite production goes into battery manufacturing.

**COBALT** Mainly produced in the Democratic Republic of the **Congo** (little in the US, Canada, Australia). 38% from nickel mining, 60% from copper mining and 2% from primary cobalt mining. Over 50% of the global demand for cobalt is used for battery production.

**NICKEL** Mainly produced in **Indonesia**, Philippines, Russia. About 8% of global natural graphite production goes into battery manufacturing.

**LITHIUM** Mainly produced in **Australia**, Chile, Argentina, Zimbabwe, Bolivia.Over 60% of the world's lithium is used for battery production.

**From 2028 industrial batteries with a capacity greater than 2 kWh [with some exceptions] shall be accompanied by documentation containing information about the percentage share of cobalt, lithium or nickel that is present in active materials and that has been recovered from battery manufacturing waste or post-consumer waste. A minimum percentage of recovered materials will be mandatory from 2031 (i.e. 16 % cobalt; 6 % lithium; 6 % nickel). This percentage will increase from 2036 (26 % cobalt; 12 % lithium; 15 % nickel).**
***this does not apply to batteries that have been subject to preparation for re-use, preparation for repurposing, repurposing or remanufacturing.**

*Data: GlobalData, Statista, Nickel Institute, Cobalt Institute, International Energy Agency, Eurostat.*



# Q&A WITH WOUTER IJZERMANS, EXECUTIVE DIRECTOR, BATTERIES EUROPEAN PARTNERSHIP ASSOCIATION (BEPA)

Wouter IJzermans
Executive Director, Batteries European Partnership Association (BEPA)

**Q: What are the major trends in emerging battery technology? Which ones will define our future?**

A: On Tuesday 26 September 2023, two new Roadmaps were simultaneously published, outlining the major research trends for the European battery value chain. The Batteries Europe Roadmap is the product of hundreds of experts from European research centres and industry players coming together in working groups to discuss European research priorities. The Battery 2030+ Roadmap is looking at the long-term research needs in Europe, outlining the ambition to radically transform the scene. The Batteries Europe Roadmap shows the continued need for building up the raw materials processing and recycling capacities in Europe in order to achieve a higher degree of strategic autonomy for Europe. On the material development side, there is a lot of attention to the reduction of critical raw materials by diversifying the battery chemistries used. However, the materials section also stresses the need for affordable lithium-ion batteries to accelerate the green transition.

**Q: On the research side, what is still needed to further unlock the potential of electric vehicles (especially in the CEE region)?**

A: Further down the value chain, the Batteries Europe Roadmap argues for more flexibility in the manufacturing processes to deal with future disruptions. The mobile applications section targets not only the needs for electric vehicle development but also sets out priorities for other applications like heavy-duty road transport, vessels, trains and aeroplanes. It shows that all these sectors are moving towards electrification, at least partially. The Battery 2030+ Roadmap follows the main tracks from the earlier two versions while including updates on the most recent developments in battery research, development and commercialisation. The three themes outlined in the roadmap are: accelerated discovery of battery interfaces and material; integration of smart functionalities; and cross-cutting areas. As the first projects that were based on Battery 2030+ are reaching the end soon, the updated roadmap includes some pre-final results on the three themes.

Both documents are influencing the direction that European research funding will take, as they are taken on board as sources for the update of the Strategic Research and Innovation Agenda (SRIA) for the BATT4EU Partnership. This SRIA sets out the basis for all future research calls on batteries under Horizon Europe. BATT4EU welcomes stakeholders from Central and Eastern Europe to join the Partnership association BEPA, to join discussions on how the SRIA will be implemented in future Horizon Europe Work Programmes.

# Emissions still rising: is the future of heavy-duty vehicles electric?

written by Claudia Patricolo, Editor-in-chief, CEENERGYNEWS



# EMISSIONS STILL RISING: IS THE FUTURE OF HEAVY-DUTY VEHICLES ELECTRIC?

**On 16 October 2023, the EU Council reached an agreement on a proposal to update and strengthen the regulation of CO2 emission standards for heavy-duty vehicles (HDVs).**
**HDVs, such as trucks, city buses and long-distance buses, are responsible for more than 25 per cent of greenhouse gas (GHG) emissions from road transport in the EU and account for over 6 per cent of total EU GHG emissions. Despite some improvements in fuel consumption efficiency in recent years, these emissions are still rising, mainly due to increasing road freight traffic.**

Thus, the new proposal aims to further reduce $CO_2$ emissions in the road transport sector and to introduce new targets: a 45 per cent emissions reduction from 2030 (increased from 30 per cent); a 65 per cent emissions reduction from 2035; and a 90 per cent emissions reduction from 2040.

“Lorries, buses and coaches are an important part of road transportation, affecting the daily lives of millions of citizens,” said Teresa Ribera Rodríguez, Spanish acting third vice-president of the government and minister for the ecological transition and the demographic challenge. “Citizens deserve to live in a greener and healthier environment and we are now a step closer towards this objective.”

**Charging infrastructure: without it, there is no future for truck electrification**

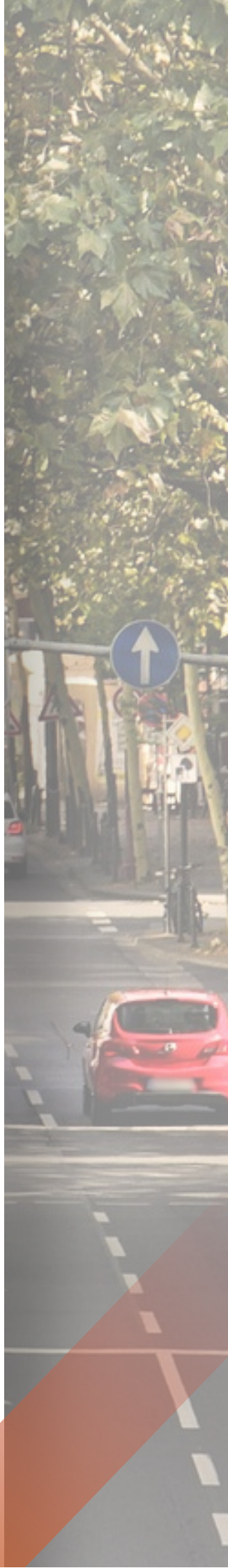
While electric passenger cars are becoming the norm in many Member States, for truck electrification many countries are lagging behind, especially in Central and Eastern Europe.

According to a recent study by pan-European integrated payments and mobility platform Eurowag, the main challenge seems to be related to the lack of charging infrastructure, which has to be suitable in terms of size, accessibility, power of the charging station and location, all factors that differ from the EVs charging points.

The report showed that in terms of readiness of the European infrastructure for battery-powered trucks, Northern and Western European countries rank at the top, led by Norway, Netherlands and Switzerland.

When it comes to CEE, Slovakia ranked 20th, followed by. the Czech Republic (21st) and Poland (22nd), which were described as moderately prepared for the operation of electric cars. At the tail end of the ranking are other Eastern European countries, like Bosnia and Herzegovina, Albania and North Macedonia.

Also, Klaus Wallenstein, CEO of MAN Truck & Bus Poland recognises that a successful electrification of heavy-duty transport will not be possible without sufficient public charging infrastructure.



# Emissions still rising: is the future of heavy-duty vehicles electric?

“The recent adoption by the European Council of the Regulation on the Deployment of Alternative Fuels Infrastructure (AFIR) is the right step towards zero-emission, heavy-duty transport,” he tells CEENERGYNEWS. “However, effective electrification of long-haul transport requires additional efforts. MAN as a manufacturer of heavy-duty electric vehicles strongly supports the development of public charging infrastructure.”

> ***The TRATON GROUP, which MAN is a part of, has signed a joint venture agreement under the name Milence to set up and operate a high-performance public charging network: 1,700 charging points are to be created for battery electric long-haul trucks throughout Europe. Nevertheless, the development of charging infrastructure dedicated to electric trucks comes with challenges. In Central and Eastern Europe and especially in Poland, the most important point is to reduce the lead time for grid connections, which can currently take up to 18 or even 24 months.***

**LNG: a bridge technology on the way to fully emission-free drivelines**

But why we should insist on truck electrification when there are many alternatives, such as liquefied natural gas (LNG) or renewable gases like biomethane?

“The future of heavy-duty transport will be zero-emission and there is no doubt that electromobility will play the key role in the upcoming transformation,” comments Mr Wallenstein. “Battery electric vehicles with fast charging are the best solution to achieve the goals of the “Fit for 55” package. This is due to the low operating costs, the top energy balance and the high efficiency of over 90 per cent.”

According to him, low-emission fuels, such as LNG, could be used for specific applications but only as a bridge technology on the way to transitioning to fully emission-free drivelines.

Currently, natural gas has a significantly lower carbon content than diesel and it emits fewer air pollutants. Especially while we wait for more infrastructure to be installed and the technology to improve, the range and the fuel efficiency are of utmost importance and LNG can promise a drivable range of up to 1,000 kilometres (for example, the Volvo FH LNG or the Scania LNG). When it comes to hydrogen, the decisive factor for the switch to battery-electric trucks is the energy cost advantage.

“On the other hand, in areas distant from charging infrastructure, the use of hydrogen or biogas may be a useful alternative, but currently it is cost-ineffective due, among other things, to higher operating costs compared to battery electric vehicles,” adds Mr Wallenstein.

As pointed out also by Catharina Modahl-Nilsson, Chief Technical Officer of TRATON Group, in truck traffic, especially on long-distance routes, pure e-trucks will in most cases be the cheaper and more environmentally friendly solution. “This is because hydrogen trucks have a decisive disadvantage: only about a quarter of the output energy flows into the drive, three quarters is lost through conversion losses. With the e-truck, the ratio is reversed,” she said.

**What makes a company ready for the electrification of heavy-duty transport**

Despite the ambitious targets set by the EU and all the regulations that entered into force in the past years and months, a recent report by Transport & Environment found out that only a few truck brands are ready to transition to 100 per cent zero-emission sales. MAN is among these.

“The successful launch of electric trucks requires actions in many sectors,” explains Mr Wallenstein. “Vehicle is still the heart of the entire project, but other areas such as recycling and charging infrastructure must be taken into account. MAN follows a closed-loop strategy for high-voltage batteries, starting with our factory in Nuremberg that will produce lithium-ion batteries, especially for our eTrucks and eBuses, up to MAN’s recycling partners who can provide a second life for the batteries or recycle them to recover valuable raw materials.”

The next key area he mentions is charging, as MAN’s customers often choose to expand their depots with their charging stations, where MAN can provide professional expertise through its premium charging partners.

“This holistic approach has made MAN ready for the electrification of heavy-duty transport,” he underlines. “Developing electromobility, bringing exceptional electric vehicles suitable for everyday use to the roads and offering innovative technologies to our customers - these are our immediate goals. MAN's Starachowice plant has just produced its 1,000th electric city bus and 80 all-electric buses have been sold in Poland. We have shown therefore already that we can handle electromobility both in terms of products and related services.”




*MAN Truck & Bus SE.*



# Q&A WITH ANELA KARAHASAN, SECRETARY, ASSOCIATION FOR ELECTROMOBILITY, BOSNIA AND HERZEGOVINA

Anela Karahasan
Secretary, Association for Electromobility, Bosnia and Herzegovina

PRIVREDNA/GOSPODARSKA KOMORA FEDERACIJE BOSNE I HERCEGOVINE

**Q: What are the biggest opportunities and challenges for the Bosnian electromobility industry in the next 12 months – and what steps ought to be taken to seize such opportunities and respond to the challenges?**

A: The biggest challenges are reflected in the development of the infrastructure in general, considering that a building permit is still needed for the installation of charging stations in new locations and this requires a lot of time and financial resources. The installation of DC charging stations is especially a challenge in the development of infrastructure, considering their cost. With the new law on electricity, we hope that this issue will be settled in the coming period, because the law provides room for the possibility of charging for EV charging services, which should significantly increase interest in the installation of charging stations, especially when we are talking about gas stations, as a great potential for the installation of DC charging stations. For Bosnia and Herzegovina, the price of EVs is still another challenge and in this regard, we as an Association for Electromobility will initiate the extension of the decision on the suspension of customs duties on the import of electric vehicles, as well as subsidies exclusively based on CO2 emissions, in the coming year. In terms of opportunities, we are talking about new business models foreseen for energy communities and according to the new law on electricity. The opportunity is represented by numerous innovations and new jobs, considering that BiH has a strong and developed automotive industry and e-mobility is a new opportunity and chance for BiH in this "war against cheap prices" with China.

**Q: Bosnia and Herzegovina's government is allocating about half a million euros to support the purchase of electric and hybrid vehicles. To what extent are the government's policies contributing to the evolution of the electromobility market? How are both individuals and businesses affected?**

A: The Government's decision on subsidies for the purchase of electric, hybrid and plug-in hybrid vehicles for individuals and private individuals has awakened interest in environmentally friendly vehicles, additionally due to the crisis in the price of fuel. The configuration of the terrain in BiH and the distances that are covered on a daily basis, along with the savings that are achieved by long-term purchase of these vehicles, also influenced the awakening of interest in environmentally friendly vehicles. It is particularly important here to mention the companies that have shown interest in a green fleet through this government decision, not only in order to realise all the above-mentioned advantages, but also because of the demands of their customers, suppliers from the EU, who demand that the companies in their work have a sustainable green, component, especially from transport. On the other hand, this Government measure has resulted in the initiation of subsidies next year only for EVs or according to the level of CO2 emissions. Through the analysis, we saw that this exact same picture happened in almost all EU countries and the region. Even now, despite all the challenges and based on the pace of achieved results and progress, especially those that we are yet to expect, we can say that electromobility is no longer knocking on BiH's door. Electric mobility, albeit shyly, is already present in BiH.



# Q&A WITH PATRIK KRIZANSKY, DIRECTOR, SLOVAK ELECTRIC VEHICLE ASSOCIATION (SEVA)

Patrik Krizansky,
Director, Slovak Electric Vehicle Association (SEVA)

**Q: What are the biggest opportunities and challenges for the Slovak electromobility industry in the next 12 months – and what steps ought to be taken to seize such opportunities and respond to the challenges?**

A: Several key initiatives should be implemented to drive the uptake of the EV market and the deployment of charging infrastructure. They are all part of the recently approved Slovakia's E-mobility Action Plan, which needs to be further implemented through specific tools and regulations. Firstly, government-approved EV purchase subsidies and corporate tax incentives are foreseen to stimulate the vehicle market to make EVs more accessible. These incentives reduce the upfront costs of EVs and encourage their adoption by lowering the total cost of ownership. A substantial investment of 46 million euros has been allocated to deploy charging infrastructure. This funding includes normal AC chargers and high-power DC charging points deployed by municipalities and businesses. In addition, 30 million euros of this package are dedicated to creating tens of Ultra-Fast charging hubs along highways, improving the convenience and range of EV long-distance travel.

**Q: In 2021, Slovakia saw a record figure in the number of cars produced in the country, maintaining its reputation as a regional leader in car manufacturing. What can the Slovakian government do to maintain the country's competitiveness in the EV transition?**

A: Slovakia's automotive industry is gradually shifting towards electric vehicles, with approximately 16 per cent of all cars produced in 2022 featuring electric powertrains. All four OEMs already make Battery Electric or Plug-in Hybrid Electric Vehicles in their facilities, signalling a commitment to EV production. Anticipated product launches are expected to boost the transition further. Stellantis will start production of its Citroën ë-C3 in its facility in Slovakia. In the next few years, another three models should be produced at the same site, while Volkswagen is set to launch a new electric Porsche model. Moreover, a fifth OEM, Volvo, is slated to begin EV production in 2026 with an annual capacity of 250,000 BEVs. Substantial investments are being made in the first and second-tier suppliers' manufacturing base. These investments are directed toward critical components such as electric powertrain, power electronics, or battery cooling systems. Companies like Schaeffler, Porsche, Bosch, Manga, Mubea and others have already launched or are preparing new production facilities. To support the growing EV production in Slovakia, attracting investments in battery cell production and battery recycling is essential. According to SEVA's estimates, Slovakia's automotive industry will require at least 80 GWh of batteries annually. For all these requirements, Slovakia should focus on building sufficient green and renewable energy capacity. Green energy sources such as wind, solar, and hydropower can provide energy for the expanding automotive and battery industries without increasing carbon emissions.

# IN SUMMARY

The question is not "*if*" the automotive sector will be electric, nor "*when*" it will happen, as we have clear targets and deadlines going towards only one direction: the reduction of greenhouse gas emissions and ultimately Europe's climate neutrality.

It is rather "*how*", this transformation will happen. Throughout this e-book we have seen that the EU as a whole has made huge steps with the adoption of the battery regulation, the AFIR and other important pieces of legislation.

Still, as we learned in our exclusive interviews, it is an ongoing learning process and many pieces must come together. For example, the infrastructure must be strengthened and further developed, especially in Central and Eastern Europe. The continent must also retain its competitiveness taking into account the different starting points of the Member States and the industry's requests, especially when facing global competitors like the US (with its new subsidies programme) and China.

But especially how the transformation of the automotive sector will lead to a greener and more sustainable Europe, not just in terms of the number of electric vehicles circulating on our roads, but also considering all the components, from the raw materials to the batteries' end of life.

We are looking forward to seeing how recent policies and regulations will be implemented nationally, especially in CEE, which is slowly turning into a hub for EVs and batteries. And, as usual, we look forward to sharing all of this with you!

Claudia Patricolo
Editor-in-chief

# MORE FROM CEENERGYNEWS



## NEXT E-BOOK

LNG & hydrogen: decarbonising CEE while ensuring security of supply

**MARCH 2024**

# EVENT HIGHLIGHTS

### 28 November - 1 December 2023 - Grand Hyatt Athens , Greece

Bringing together the most senior LNG leaders from across the global value chain, this year's World LNG Summit & Awards will define the critical role LNG and gas will play in delivering energy security, economic stability and the ongoing drive for decarbonisation.

23rd World LNG Summit & Awards

### 14 - 15 November 2023 - Bordeaux, France & online

The Battery Innovation Days event fosters dialogue among the Research community, Policy makers, Industry players and end-users to ensure a constructive feedback loop towards the definition of research and innovation priorities in Europe.

BATTERY INNOVATION DAYS

### 4 December 2023 - Hotel Marriott Budapest, Hungary

The Budapest Climate Summit brings together policymakers, industry experts, corporate leaders, technology pioneers and next-generation sustainable leaders to share their perspectives on how to enable businesses and civil society to deliver actions necessary to achieve our common climate objectives.

BUDAPEST CLIMATE SUMMIT

### 4 December 2023 - Hotel Marriott Budapest, Hungary

The CEENERGYNEWS Awards ceremony will recognise for the first time the most influential energy leaders and experts in Central and Eastern Europe.

CEENERGY NEWS AWARDS 2023

### 9 April 2024 - Hotel Marriott Budapest, Hungary

The Budapest LNG Summit is focusing on the up-and-coming LNG region of Central & Eastern Europe, connecting regional demand with the international supply chain.

BEST BUDAPEST LNG SUMMIT ALL ABOUT NATURAL GAS

### 10 April 2024 - Hotel Marriott Budapest, Hungary

The Budapest Hydrogen Summit aims to bring together top industry stakeholders and policymakers from the CEE region and beyond to discuss the opportunities and challenges of shifting towards hydrogen technology and to find out how this fuel could contribute to a carbon-free future.

BUDAPEST HYDROGEN SUMMIT

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