

Spain steps up as Europe's battery sector faces a crossroads

The 30th anniversary of the annual International Congress for Battery Recycling (ICBR) in Valencia set the stage for a high stakes race in the battery arena.

Growing demand for materials and patchy feedstock availability are in conflict, thrown more off balance by ever more ambitious recycling targets. The presence of lithium iron phosphate batteries could further disrupt the sector.

The global market for electric vehicles (EV) battery recycling is set to reach EUR 21.1 billion by 2035. This is up from EUR 492 million in 2024, representing 40.8% compound annual growth, report analysts at Vantage Market Research. They expect 200

million EVs will be on the road in 2030.

LFP WAVE

'What will these batteries look like?' posed market analyst Lee Allen of Fastmarkets at the Valencia assembly.

'Lithium-ion chemistries are not a fact of life. Let's not forget that higher volumes of lithium iron phosphate (LFP) batteries are already trickling into the European market. This segment will rise sharply in the next few years. Are we ready for that?' Allen laments that EU recyclers currently receive gate fees and are paid to take LFP scrap but there are few outlets for LFP black mass – even though leading brands such as Tesla, BYD, Toyota, Citroen and Ford have created LFP-based vehicles. Domestic recycling capacity to refine black mass of all chemistries is limited across Europe and recyclers are calling on EU regulation 'with teeth' to



Recycling players wonder if lithium-ion batteries will remain the preferred chemistry in the foreseeable future.

encourage the growth of domestic recycling – meaning more cathode active material (CAM) and precursor cathode active material (p-CAM) capacity.

There are concerns over the EU's updated List of Waste marking LFP black mass as hazardous waste, making it difficult to move across borders. 'India is promising for commercial-grade LFP material but it is tricky to capitalise on this seeing as it is a non-OECD country,' Allen points out. 'LFP potential can take flight, if we get rid of these obstacles.'

FORÇA!

Spain's Minister for Environment Vicente Mus told ICBR delegates that a new flagship facility specialising in car batteries will soon be online in Valencia. 'Operated by Volkswagen, it will start operations in mid-2026 and have a production capacity of 60 GigaW per year. It will not just produce unified battery cells, it will also be able to recycle them,' Mus points out. 'That's the kind of innovation that will drive real circular change.' José Morata, who heads Valencia's chamber of commerce, is proud Spain has been 'very actively' working on its battery recycling credits. The building momentum doesn't surprise him, as one in nine of registered cars is an EV. The latest figures by Mobility Portal Data indicate that, in August, 61 315 passenger cars were sold in Spain, of which almost 15 000 were electrified and 7 032 were 100% electric. The EV market grew by 162%, led mostly by businesses.

Spain's Ministry for Ecological Transition and the Demographic Challenge has launched a EUR 100 million programme for eco-design and recycling of renewable energy equipment, with another EUR 300 million in aid for their domestic production. 'This is meant to boost the recycling of solar panels, wind turbines and batteries,' Morata states.

AFTER THE FLOOD

Valencia councillor José Olano appreciated inquiries from delegates about the city's 'horrible floods' a year earli-

er. 'As someone who saw the chaos and destruction up close, it was something I will never forget. We've run the numbers and can now say that 120 000 vehicles were ruined in just 10 hours.'

Total cost to the environment and economy is estimated at EUR 30 billion. EU backing of almost EUR 2 billion has been approved to help Valencia recover, on top of central government support of EUR 10.5 billion.

Olano says many wrecks ended up in hard-to-reach locations or sunk into riverbeds. They were caught by fences, buildings or trees and damaged beyond repair, mostly due to corrosion. 'It proved to be an enormous challenge for emergency staff and recovery specialists. That makes me even more proud to say that we were able to overcome this big disaster and complete the proper recycling of all cars at authorised treatments facilities.'

This means the recycling process was fully supervised and carried out with the proper equipment. 'I do believe the flood was one of the most difficult challenges Valencia has faced in recent history.'

INVESTMENTS FLOWING

Another prime example of Spanish leadership for Morata is a collaboration between Ilunion Economía Circular, energy storage specialist EFT-Systems and Chinese start-up Botree Recycling Technologies. 'They announced the construction of an advanced lithium-based battery recycling plant in Valladolid in January. It will surely become an impressive plant taking up almost 30 000 square metres and processing some 6 000 tonnes of batteries per year.' Work is underway at Boecillo Technology Park, with the project creating at least 40 direct jobs. An added social benefit is that the site will be managed as a Special Employment Center, meaning that more than 70% of the workforce is made up of people with disabilities. The joint venture partners are turning to hydrometallurgy to extract lithium



Valencia had to clear at least 120 000 car wrecks following last year's floods.

from end-of-life batteries. The site will especially target LFP batteries with hopes of putting the materials back into the battery production cycle.

Key to achieving this is Botree's direct material-to-material repair method. Its proprietary co-extraction process simultaneously recovers nickel, cobalt and manganese for battery-grade materials. Company founder Lin Xiao and ICBR exhibitor explains this innovative method cuts equipment costs by more than 30% and reduces energy use by over 10% compared to conventional processes.

'Botree recently landed a new round of funding of more than EUR 12 million to scale up our impact in the near future,' Lin enthuses. 'It's a very dynamic market seeing a lot of changes. That's why we try to be the bridge between the battery recyclers and manufacturers.'

Similarly, South Korean battery recycler SungEel HiTech has also expanded into Spain – as well as France and

Germany. Its sites have the capacity to treat at least 10 000 tonnes of batteries per annum, enough to power around 25 000 electric vehicles. More than EUR 18.5 million was invested in the Spanish facility, which recently opened in Navarre.

ANTICIPATE, ADAPT

José Pérez García, president of Ecopilas, a Spanish network of battery collection points, was celebrating the group's 25th anniversary. 'Much has changed since day one. We were originally founded by primary battery producers but over time our scope expanded to rechargeable batteries such as nickel-cadmium and lithium. Today, Ecopilas covers all categories and chemical families of batteries.' The battery market is not what it was 25 years ago, García recalls, and technology has changed drastically. 'At that time, lithium and electric mobility was virtually non-existent. Alkaline and lead-based batteries were the cornerstone of the industry. As a result, we've had to continually adapt to this evolving reality and the new waste flows that have emerged. New players, new channels, new treatment technologies... Evolving remains an exciting challenge.'

Ecopilas strives to be more in touch with the market through participation in European R&D projects via its innovation platform Recyclia. 'Currently, we are working on five projects, and two more have been granted to us in the past year. Most of these focus on various aspects of lithium treatment, including safety, transportation and commercialisation.'

GOODBYE DRONES

In Ukraine, Lyuba Kolosovska, founder of collection scheme Battery Busters, is keeping her eyes to the sky. 'It's absolutely vital to recover every last battery. I am hoping to reclaim those from drones sent in by Russian forces. Turning them into a power source for my people would be so meaningful,' she tells Recycling International. 'It's a way to turn a negative into a positive.'

Ukraine currently produces around four million small military drones per year. The nation's monthly production increased tenfold this summer. 'It would be an eternal waste to just let these valuable assets lie in the dirt,' Kolosovska asserts. 'The recycling opportunity is huge in both directions. I am here to learn more about dismantling and recovery methods,

and to network. Ukraine needs recycling allies now more than ever.' Although her country is at war, doesn't mean her colleagues at Battery Busters will give up on our quest. 'I think we can all agree that resource independence is more important today, with everything that's going on.'

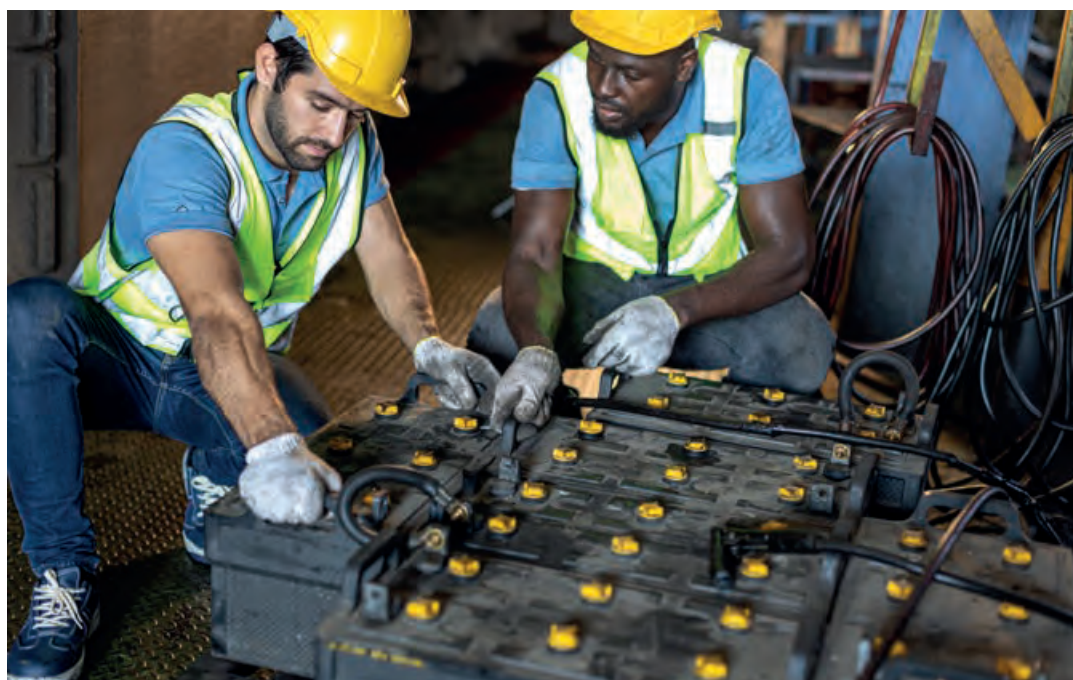
To help Ukraine amass more tonnage, Kolosovska is trying to unite European citizens, recyclers, battery importers and retailers to send used batteries to Ukraine for recycling. The slogan is 'Surrender your batteries', with 1 600 collection points in busy public areas nationwide. There are also plans to mine landfill sites. Official recycling rates are unclear, with reports putting them between 5% and 10%. Some developments could help the country catch up, despite political tensions. For instance, Eco Recycling Lviv is setting up a modern battery recycling plant in the city of Lviv (about an hour from the Polish border) that will treat 10 000 tonnes of batteries per year. This would be Ukraine's second dedicated lithium-based battery recycling plant. The recycler hopes to increase processing capacity to 24 000 tonnes per annum.

ENERGY NEEDS

Kolosovska adds that energy storage solutions are gaining popularity in Ukraine in the wake of the nation's infrastructure crisis following Russian attacks. Recently, DTEK Group, Ukraine's largest private energy company, teamed up with Fluence, a joint venture of Siemens and AES, to launch the country's largest battery energy storage system with a 200 MW capacity.

The project includes six sites, each with 20 MW to 50 MW, capable of storing up to 400 MW-hours, enough to power about 600 000 homes for two hours.

Ukraine has large deposits of 21 of the 30 raw materials recognised by the EU as 'critical', including lithium, cobalt, manganese, plus rare earth elements. 'Developing recycling and mining partnerships would benefit



Adapting to new battery recycling realities is an exciting challenge, according to Ecopilas.

our European allies and help secure critical feedstock in the long run,' adds Kolosovska. 'It's a win for all of us.'

'Nissan Leaf is hardly a novelty anymore, yet it is having a resurgence in Ukraine,' observes Hans Eric Melin, md of think tank Circular Energy Storage Research & Consulting. 'Ukraine as well as Denmark, Georgia, Jordan and Hungary are huge importers of used electric cars. The reuse ratio of light car batteries is quite high, with energy storage applications soaring to new heights practically every year.'

Melin adds that the thriving reuse market for car batteries is becoming a big problem for recyclers. 'It is really difficult to have a strong position if the market is against growth in a certain segment, so recyclers are trying to grow upstream.'

REVERSE LOGISTICS HUBS

Ceva Logistics is launching a reverse logistics service for the recycling and reuse of lithium-ion batteries in Europe. Central to this mission is building a network of 15 battery logistics centres across ten countries by 2027. They are being designed with carmakers in mind to ensure a reliable, scalable solution.

The new service includes:

- Collecting end-of-life batteries from car dealerships, resellers and end-of-life vehicle centres across Europe
- Transporting them to recycling companies after processing
- Providing battery diagnosis, dismantling, regeneration or reconditioning services
- Tracking each battery in real time through the reverse logistics and recycling process

ICBR delegates heard that battery recycling centres will be set up in France, Spain and the UK by the end of this year. 'We are planning additional centres in Germany, Italy, Poland, Sweden, Switzerland, the Netherlands and the Czech Republic in 2026 and 2027,' according to company ceo Mathieu Friedberg. A trial battery logistics centre has been running successfully at Ceva's vehicle

logistics hub in Ghislenghien, Belgium since 2022.

Ceva organises the collection of batteries from car dealerships, vehicle resellers and end-of-life vehicle centres. It then analyses the status of the batteries to determine whether they should be dismantled or reconditioned. After temporary controlled storage, Ceva delivers the modules and waste to recycling centres or second-life facilities.

Each of the battery centres will be co-located at Ceva's finished vehicle logistics platforms. They will feature battery-proof storage zones and secure containment units installed in temperature-controlled containers equipped with racks, temperature and humidity monitoring equipment. 'Safety will be ensured by 24/7 alarm system,' says company ceo Mathieu Friedberg.

He adds that dedicated workshops will carry out battery diagnostics, deep discharge, dismantling and reconditioning operations. All of this will ensure that his team's new service complies with strict regulatory requirements for battery processing. Ceva Logistics became a member of the EU Respect consortium in 2022. The collaboration of 18 companies aims to foster a green recycling process of lithium-ion batteries. Ceva's contribution is to develop the processes round handling, storing and transporting the batteries.

'HOPELESSLY OUTDATED'

Speakers at the 30th ICBR warned that policy and investment must catch up with growing EV sales and recycling targets. 'This is easier said than done. The road to hell is paved with good intentions,' observes Petr Kratochvil, general manager at Ecobat. 'The EU List of Waste (ELW) urgently needs updating to take into account new chemistries and products.'

Kratochvil argues the EU waste list dating back to 2000 is 'hopelessly outdated'. It covers only five battery types while the new one will identify 55. The Czech Republic, his home country, already recognises 44 cate-



Ukraine-based collection group Battery Busters aims to recycle military drone batteries.

gories. 'The presence of hazardous substances in batteries doesn't make it hazardous waste,' he adds, underlining that the proposed update is 'too narrow'.

'They only looked at chemical substances and recycling efficiency reporting. This is a big mistake, an oversimplification of a complex waste stream.'

Transboundary shipment rules add to the burden. 'There are many notifications these days because the transport goes through multiple countries. A recycle may receive up to ten notifications for one shipment before it reaches its final destination. That's a little over the top, isn't it?'

Rana Plant of the European Commission's DG Environment added a policy perspective and noted that 'batteries are lasting longer these days'. Chemistry diversity remains a challenge and manufacturing scrap is

BATTERIES

growing fast. 'Modern recyclers are dealing more and more with manufacturing waste, which is a lot purer than scrap,' he said.

'There are many varieties of battery chemistries and some are easier to treat than others. The EU's standpoint is not to push tricky chemistries out of the market from the get-go. We want to enhance available technologies to treat them better.'

Plant reminded delegates that, from February 2027, batteries from EVs will need to be removable and easy to dismantle.

BATTERY LEAKAGE

Emilie Acke, lithium-ion specialist at Belgian collection group Bebat, highlighted the hidden losses of the scrap waste stream. 'About half of Europe's battery feedstock leakage is due to third-party collection, according to Deloitte data,' she said. 'Ultimately, it's vital to be aware we measure collection data too early and overlook too much.'

Batteries often stay embedded in discarded electronics or are quietly hoarded. Exports to other EU states further blur the picture. 'We don't just need good data, we need a better system,' Acke stressed. 'Or we will not be able to meet future recycling or collection targets.'

For her, cooperation is key. 'The success of our future depends not on single actions but on the unwavering commitment of everyone at the table.' Cédric Demonthy, vice president battery solutions at Umicore, warned of a fragile supply chain. 'Leakage of black mass to markets outside of Europe is a real problem. We need to incentivise Asian battery producers to recycle locally here. So how to address this issue? Especially bearing in mind trade rules are too slow and trade notifications take too much time.' Demonthy insists the industry has to stop wasting time and instead focus on creating unity. He believes Europe must act now. 'If you really want to be competitive, you have to take down borders in Europe first. The good news is that Europe has the technology and capacity. With the right levers and steady investments, we can build a resilient BEV supply chain.'

Encouragingly, Umicore returned to profitability in the first half of this year after recording losses in the first and second halves of 2024. Umicore reports adjusted earnings in its recycling unit before interest, taxes, depreciation and amortisation amounted to EUR 190 million in the first half of 2025. Sales revenue rose by approximately 17% in the first half of this year compared to 2024.

BASF BACK ON TRACK

BASF's head of marketing and project management battery recycling Daniel Waldmann struck a similar note of cautious optimism, sparked by relatively strong sales in the EV segment. 'There are many encouraging headlines about e-mobility and battery innovation, growing consumer awareness as well as R&D breakthrough and funding for start-ups.'

The chemical engineer lamented that Europe lacked refining capacity for black mass. 'Building up the value chain remains challenging. As we all know, there is no magic button that delivers 100% pure black mass in one go. Recycling is a multi-step and arduous process.'

BASF opened a black-mass facility in Schwarzheide, Germany in June after a five-year delay. It can treat 15 000 tonnes of EV batteries a year, including production scrap. The process is flexible and includes a comprehensive off-gas treatment system.

'We delayed our investments because market conditions were not favourable,' Waldmann said. 'So while we are confident this is the right path, there are some detours and some outstanding concerns.' He is calling on the sector to join forces. 'Let's shape the future of e-mobility together.'

Battery 'leakage' due to third party collection and exports remains an issue.

