Automotive News Europe
A CRAIN FAMILY BRAND

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Why an Audi, Stellantis battery 'matchmaker' expects to help automakers generate billions

Germany-based Circunomics is using digital tools to marry supply and demand for new and used EV batteries.

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AUDI

When the Audi Q4 E-Tron reaches the end of its life cycle, its battery (shown, right) will be used in second-life concepts or recycled as a source of raw materials. German supplier Circunomics is helping Audi with this.

Felix Wagner, a co-founder and the CEO of Circunomics, has captured the auto industry's attention with a big promise. He says the German company can help global top 10 automakers generate €1 billion in additional annual revenue starting in 2030.

How? By helping them sell the batteries in their full-electric vehicles to companies looking to give them a second life – or a first life, to help automakers cope with the slowdown in electric vehicle sales in Europe.

The Mainz-based startup, which is currently in negotiations with several leading automakers, made the calculation based on current market conditions, under which automakers receive between €40 and €70 ($44 to $77) per kilowatt-hour per battery, depending on the battery's condition.

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That number is expected to grow, especially as more automakers in Europe transition to offering EVs to comply with 2035 rules, which will require that new cars sold in the region emit zero CO2 emissions.

Starting in 2030, Circunomics expects 5 to 6 million end-of-life batteries from passenger vehicles alone to be scrapped each year. In secondary use, companies will utilize the remaining performance capacity of the batteries for several years before they reach their end of life and need to be recycled.

Matchmaking supply with demand

Circunomics essentially acts as a battery broker, working directly with leading automakers such as Stellantis and Volkswagen Group subsidiary Audi to trade batteries and identify demand for second-life batteries, as well as helping with contract negotiations and clarifying any technical issues.

"We know there are others out there that might be willing to use these batteries in whatever use case," Wagner said. "We help automakers find the right partner."

CIRCUNOMICS FAST FACTS

What it does: Matches supply and demand for batteries and employs predictive analytics to assess the health of batteries
When established: 2019
Where: Mainz, Germany
Goal: To establish itself as the world's largest digital marketplace for second-life use and recycling of used batteries within the circular economy
2023 trading volume: 279 megawatt-hours of storage capacity (batteries,
2024 trading volume goal: 625 to 650 mWh
2026 trading volume target: 3 gigawatt-hours

In other words, the company offers a type of matchmaking service.

"The battery is quite complex, so you cannot use every battery for every potential use case. It needs to be clear what is the desired potential reuse case and if these batteries also fit from a technical perspective," he said. "That is where we come into play and help both sides of the market to make a perfect match."

For batteries where a second life isn't possible, Circunomics connects automakers with recyclers, which helps brings down prices, speeds up efficiency and creates a kind of stock market, Wagner said.

Europe's EV battery oversupply

Circunomics has found itself performing another function: finding homes for the growing number of batteries that are not being placed in vehicles in Europe because of the slowdown in EV sales in the region.

Through July, sales of full-electric vehicles rose 0.7 percent to 1,097,433 in Europe. After the first seven months of 2023 sales of those cars grew 47 percent to 1,089,412, according to figures from market researcher Dataforce.

WHO IS FELIX WAGNER?

CIRCUNOMICS

Circunomics CEO Felix Wagner

Circunomics CEO Felix Wagner co-founded the company in 2019. Before that he worked as a partner at Next Mobility Labs in Mainz, Germany. Previous roles include working as a business and innovation manager at mediaman, a digital agency in Mainz, and as a senior project leader for Cocomore, an online marketing agency in Frankfurt.

"A lot of automotive-oriented factories actually have an oversupply of batteries because of declining sales numbers and that is a problem at the moment," Wagner said. "Obviously, they had to make long-term purchase agreements, so those suppliers keep on shipping batteries from Asia to Europe."

Calendric aging means that automakers can't just store batteries in a warehouse until demand rebounds. Those batteries lose capacity over time.

Automakers can't sell a car equipped with a stored battery with capacity that is below 100 percent. This results in pressure to bring this oversupply to the market.

Moreover, if a dissatisfied EV customer returns to a dealership and asks for a battery replacement, automakers have to take back the pack for free, assuming any costs involved in logistics, recycling and potential repurpose, Wagner said.

He added that automakers currently refuse to sell their oversupply of battery packs to a competitor. Therefore, Circunomics sells the batteries from full-electric and plug-in hybrid electric vehicles to non-automotive players. For example, the startup helps Audi sell its unused and second-use batteries to the German rail company Deutsche Bahn.

Circunomics also trades battery raw materials such as black mass to cover the whole circular economy at the end of a battery's life.

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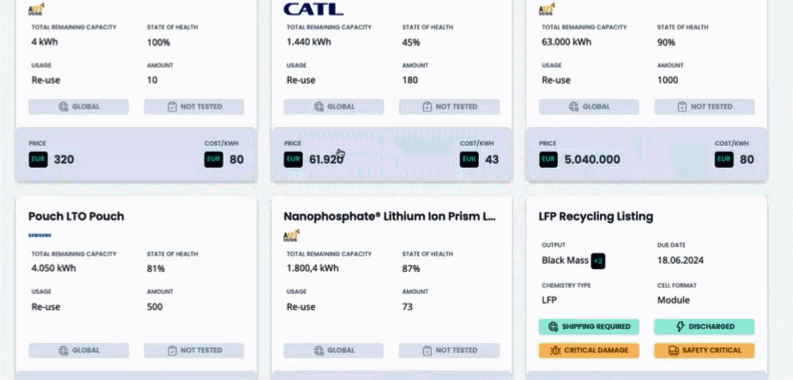

TOTAL REMAINING CAPACITY 4 kWh
STATE OF HEALTH 100%
USAGE Re-use
AMOUNT 10
PRICE EUR 320
COST/KWH EUR 80

TOTAL REMAINING CAPACITY 1.440 kWh
STATE OF HEALTH 45%
USAGE Re-use
AMOUNT 180
PRICE EUR 61.920
COST/KWH EUR 43

TOTAL REMAINING CAPACITY 63.000 kWh
STATE OF HEALTH 90%
USAGE Re-use
AMOUNT 1000
PRICE EUR 5.040.000
COST/KWH EUR 80

Pouch LTO Pouch
TOTAL REMAINING CAPACITY 4.050 kWh
STATE OF HEALTH 81%
USAGE Re-use
AMOUNT 500

Nanophosphate® Lithium Ion Prism L...
TOTAL REMAINING CAPACITY 1.800,4 kWh
STATE OF HEALTH 87%
USAGE Re-use
AMOUNT 73

LFP Recycling Listing
OUTPUT Black Mass +2
DUE DATE 18.06.2024
CHEMISTRY TYPE LFP
CELL FORMAT Module

CIRCUNOMICS

Circunomics offers battery sellers and buyers an AI-based analytics tool to assess the health of each used battery and simulate remaining capacity. The screenshot gives an example of how the tool works.

Analyzing remaining battery life

As well as providing a trading platform, Circunomics also offers battery sellers and buyers an AI-based analytics tool to assess the health of each used battery and simulate remaining capacity.

"That way we are really able to predict when the best time is to bring these batteries into a different usage phase; what is the best usage profile; and how to get the most out of these batteries in terms of value," Wagner said.

Circunomics' battery analytics can tell automakers how much capacity the batteries have lost and the state of the batteries' current health. Battery analytics enables Circunomics to "actually build transparency along the whole value chain" between the market suppliers and the demanders and recyclers at the end of the market, Wagner said.

"We haven't seen anyone else yet who is really covering the entire value chain and has also integrated the recycling process into its life management solutions. Recycling alone is a quite complex topic and we actually integrate the whole thing into one solution," Wagner said.

The EU's introduction of a battery passport regulation is also set to help the startup to sell its analytics product. The passport means that every organization that brings a battery larger than 2 kilowatts to the market will have to provide relevant data within that battery passport. Information includes the battery's current health, where the raw materials come from and the actual cell types used.

Earning money via commissions based on trading volume or through a pay-for-use model, Circunomics aims to be profitable in 2026, depending on how the market develops and how its expansion plans proceed.

No worries about EV slowdown

When asked whether the EV sales slowdown is causing him concern, Wagner said that the downturn, "doesn't surprise people who have a technology background. Most of them say it's quite natural and very logical what is happening out there at the moment."

Referring to the Gartner Hype Cycle, which shows how a technology or application will evolve over time, Wagner added that the industry has now reached a "typical downturn" after a few years of "hype" before it will reach an expected "industry plateau of happiness."

"I understand that from an automotive perspective, people might be a little uncomfortable at the moment," Wagner said. "But from our perspective, when looking at the entire journey that we have in front of us, we are still at the very beginning of that overall market."

Fortunately, the company's investors also understand the market dynamics and are therefore also not nervous, he said.

In fact, the market's current volatility is advantageous to Circunomics in some respects, the company says.

"It is helping us get more access from the oversupply side of the market," said Jan Born, a Circunomics co-founder and the company's CTO.

In addition, he said the current slowdown will give the five-year-old company more time to scale up its digitized processes.

"We were very early in the market, so we have been able to prepare a lot in terms of providing the right services," Born said.

WHO IS JAN BORN?

CIRCUNOMICS

Circunomics CTO Jan Born

Circunomics CTO Jan Born co-founded the company in 2019. Previous positions held include working as a partner at Next Mobility Lab and as a managing director and CTO at mediaman.

At the outset, Circunomics' original intention was to bring batteries from their first life into their second life. Learning about market dynamics, however, made them understand that, "if you really want to scale that business also from a commercial perspective in the coming years then we also need to think about other sources of batteries, because there aren't many yet on the roads and we can't wait another 15 years," Born said.

Looking ahead, Circunomics is "intensively" examining four U.S. locations — Michigan, Georgia, North Carolina and South Carolina — for a North American base. It will decide on a location this year, with plans to be operational starting January 2025.

Wagner added that Asia is also a "very interesting and high-volume market."