S&P Global Mobility

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Automotive Supplier Outlook 2025

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As we approach the end of yet another eventful year, we take the opportunity to assess the industry's current state by reflecting on the significant events of the past year and exploring the outlook for 2025.

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Introduction

S&P Global Mobility's Matthew Beecham has engaged senior executives from 42 suppliers in the automotive supply chain for an end-of-year interview initiative. This initiative seeks to gather valuable insights into the challenges faced in 2024 and the strategies being formulated for 2025, prioritizing genuine experiences over elaborate strategies.

This report is the third of four volumes. The key discussion points include the challenges faced by automotive suppliers, including increased raw material costs, supply chain disruptions, and regulatory compliance issues. It discusses advancements in electric vehicle and autonomous driving technologies.

Overview

This third instalment of our 2025 Supplier Outlook draws insights from a diverse array of suppliers. It details the challenges they face, including escalating raw material costs, supply chain disruptions, and regulatory hurdles, with specific examples from companies like KleanDrive, Novelis Europe, and Mobileye. This report further highlights key technological advancements in electric vehicles (EV) and autonomous driving, showcasing the contributions of suppliers such as Lenovo, Nvidia, and Nano One. As the industry increasingly prioritizes innovation and sustainability, it outlines strategies for suppliers to effectively navigate the evolving market and secure their success in 2025.

Challenges faced by automotive suppliers in 2024

In 2024, automotive suppliers faced substantial challenges impacting their operations. KleanDrive dealt with rising raw material costs that affect the production of its tire technologies. Novelis Europe experienced supply chain disruptions that hinder the availability of aluminum, essential for lightweight vehicle designs. Mobileye confronted regulatory challenges related to the integration of its advanced driver-assistance systems (ADAS) into vehicles. These issues highlight the need for suppliers to reassess their procurement strategies and enhance supply chain resilience.

Developments in the automotive sector

The automotive sector is advancing rapidly, particularly in EV technology and autonomous systems. Lenovo is integrating AI into vehicles, enhancing user experience and safety through advanced infotainment systems. Nvidia is providing high-performance computing platforms that support AI applications for autonomous driving, facilitating the development of self-driving technologies. Additionally, Loxo is focusing on connected vehicle solutions, addressing the growing demand for enhanced in-car connectivity.

Outlook for 2025

Suppliers are optimistic, positioning themselves to seize emerging opportunities. For example, Konect aims to expand its offerings in connected vehicle technology, responding to the demand for improved in-car connectivity. Meech is investing in manufacturing innovations to meet the rising demand for quality automotive components. Nano One is advancing its battery technology to support the growth of the EV market, while Monolith is developing sustainable materials to align with industry sustainability goals.

Key issues to address

Key issues requiring attention include the need for a skilled workforce, as suppliers like KleanDrive and Mobileye seek talent in software engineering and data analytics. Increasing regulatory pressures regarding emissions and safety necessitate proactive engagement with policymakers to ensure supportive regulations. Collaboration within the supply chain is critical, particularly for suppliers like Novelis Europe and Nuro, to address common challenges and enhance overall industry resilience.

KleanDrive

UK-based KleanDrive offers an alternative for advancing zero-emission fleets while promoting environmental and social responsibility. Its Repower program enables fleet operators to electrify commercial vehicles efficiently and cost-effectively.

We spoke to Joe Tighe, CEO of KleanDrive.

Key takeaways:

- **Challenges:** Government support for inefficient technologies hinders progress on effective battery-electric mobility and zero emissions due to the fossil fuel industry influence.
- **Developments:** Falling battery costs from mainland China make electric repowering of diesel buses and trucks the best option for decarbonizing fleets.
- **Outlook for 2025:** Fleet operators are converting existing vehicles to electric, supported by infrastructure, saving time and money while enhancing sustainability.
- **Emerging issues:** Removing entrepreneurial tax relief may push UK electric vehicle businesses abroad, harming innovation and future job creation.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Joe Tighe: One of the biggest challenges this year has been the government’s support for inefficient technologies such as hydrogen for mobility and so-called 'sustainable' fuels. This continues to dilute progress on proven, viable solutions like battery-electric mobility. While progress with electric technologies remains promising and rapidly evolving, deployment is slowed by mixed messages influenced by vested interests — especially from the fossil fuel industry, which steers officials away from the most direct path to zero emissions and a fossil-free future on our streets.

What was the most positive development you witnessed in your sector in 2024?

The falling cost of battery systems from mainland China has greatly benefited the EV sector, making the electric repowering of existing diesel buses and trucks the most eco-friendly, cost-effective and efficient path to decarbonising commercial fleets.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

The floodgates have opened, and fleet operators now recognise that the only feasible path to zero emissions is by converting their existing vehicles to full electric. Infrastructure is rapidly being established to support these conversions, helping avoid the massive carbon footprint of manufacturing new electric buses or trucks. By upcycling their current diesel fleets, operators can save valuable time and money while making an impactful shift toward sustainability.

Is there any specific concern or emerging issue you would like to highlight?

Removing the UK's entrepreneurial tax relief risks further pushing our emerging electric vehicle businesses and supply chains abroad, increasing time and costs for solution providers and OEMs [original equipment manufacturers]. The growth of our manufacturing sector depends on fostering disruptive technologies and innovative business models. Without support for entrepreneurs, we’ll struggle to build the businesses — and jobs — that will define the future.

Konect

Gilbarco Veeder-Root (GVR) is a supplier in the fuel retail sector, offering infrastructure and support services to oil companies and fleets. Its parent company, Vontier, has developed the Konect ecosystem, an integrated electric vehicle charging solution designed specifically for the convenience store industry.

We spoke to Om Shankar, general manager and vice president, Konect.

Key takeaways:

- **Challenges:** With EV adoption at a critical juncture, accessible charging infrastructure is essential for encouraging widespread uptake.
- **Developments:** Despite slowed growth in some markets, the rise in EV sales is positive. Fuel retailers have a unique opportunity to facilitate the transition to electric mobility by providing convenient services at their strategically located stations.
- **Outlook for 2025:** Fuel retailers need access to support and technical expertise to succeed in EV charging, including charger assessments and efficient business models, ensuring profitability through dependable equipment and ongoing maintenance to maximize charger uptime.
- **Emerging issues:** The US, Europe and the UK are lagging in public charging infrastructure for EVs. As technology advances, strategically placing new charging points in familiar locations presents a significant opportunity for the existing fuel retail network.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Om Shankar: We launched Konect earlier in 2024, and launching a new business always comes with its challenges. It's also very exciting, especially when your business will help with the vital transition to clean transportation. Konect's mission is to create the most compelling business case for fuel retailers to install EV charging on their sites. EV adoption is at a critical point, with people and businesses needing confidence to make the switch. Widely accessible charging infrastructure is the key to further uptake, and we aspire to remove hurdles and build an incredible business case for fuel retailers to play a major part in the EV transition.

What was the most positive development you witnessed in your sector in 2024?

I see the growth in EV sales as a tremendous positive. Growth rates may have slowed in some markets this year, but there's only one direction of travel. The transition to electric mobility is driven by necessity, but it also needs to be focused on creating a convenient and positive experience for drivers. When these two factors are considered, it's clear that fuel retailers have a unique opportunity to help bridge the gap. These retailers are already strategically located along major highways and provide familiar services to drivers, including essential amenities. Encouragingly, fuel retailers are already beginning to embrace this potential.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

For fuel retailers to truly unlock their potential in the EV charging space, the industry must ensure that they have access to the right support and technical expertise. At the outset, this means helping retailers [to] assess how many chargers to install, evaluate the capacity of their local energy grid, and determine the most efficient business model for their charging services. Profitability is a key concern for fuel retailers as they move into the EV charging market. To make their investments in EV infrastructure worthwhile, they need dependable charging equipment as well as ongoing maintenance and servicing to maximise charger uptime. Konect is well-placed to support them every step of the way.

Is there any specific concern or emerging issue you would like to highlight?

Our research shows that the US, Europe and the UK are more than six times behind the number of plugs needed to meet growing EV demand by 2030.

Yet at current installation rates, key global EV markets won't meet the public charging infrastructure needed to meet growing EV demand. We know that most EV drivers currently plug in at home, but there's a second cohort of buyers, beyond the early adopters, that don't have the same facilities.

As EV technology improves, costs go down and range goes up — more people will make the switch. We must match this progress with the right amount of readily available public charging. We need some logical thinking on the placement of new charge points — ideally, locations that are already familiar and convenient for car drivers. That's the golden opportunity for the existing fuel retail network.

Lenovo Vehicle Computing

Lenovo Vehicle Computing uses large-scale computing and AI to advance autonomous driving, offering Level 2 to Level 4 platforms and intelligent cockpit solutions.

We spoke to Donny Tang, vice president and head of Lenovo Vehicle Computing.

Key takeaways:

- **Challenges:** Lenovo faced challenges in meeting customer demands for advanced computing in the autonomous driving sector, focusing on expediting Level 4 domain controller production while ensuring quality, reliability and competitiveness in a rapidly evolving market.
- **Developments:** The rapid adoption of AI in autonomous driving and smart cockpit applications has advanced significantly, with vision language models for driving algorithms and large language models enhancing human-computer interaction and scenario perception across the industry.
- **Outlook for 2025:** To enhance smarter vehicle development by integrating AI and consumer electronics into the driving experience. In 2025, collaboration with industry partners will focus on improving driving safety and user experience, with speed in technology deployment considered as crucial.
- **Emerging issues:** The swift transition to smart vehicles requires balancing rapid technology adoption with essential safety and reliability measures. A deep understanding of automotive requirements and computer technology is vital for ensuring a healthy and secure automotive industry.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Donny Tang: Our goal is to swiftly bring Lenovo's expertise in computing and intelligence from the IT domain into the hands of automotive OEMs [original equipment manufacturers].

The most significant challenges our business encountered this year were how to meet customer demand for higher computing power platforms and smarter solutions.

The rapid acceleration of end-to-end technology developments in the autonomous driving industry. To meet the increasing demands of our clients, we had to strive diligently to expedite the mass production of our first L4 [Level 4] domain controller. This required us to navigate complex technical challenges, ensure high quality and reliability, while also maintaining a competitive timeline to stay ahead in the rapidly evolving market.

What was the most positive development you witnessed in your sector in 2024?

The most positive development in my sector this year has been the significant strides that the whole industry [has made], so quickly adopting AI technology in both autonomous driving and smart cockpit applications, which requires complex hardware and software technologies and products.

This year, vision language model-based E2E autonomous driving algorithm technology has been more [frequently] used by OEM and autonomy companies, through which a significant advancement has been achieved.

On smart cockpit applications, large language model-based human-computer interaction and perception of in-car and out-of-car scenarios are also widely developed by different parties.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

We target to leverage our technology to help automakers build smarter vehicles. You can expect to see Lenovo's technology playing a significant role in cars, as we further integrate our AI capabilities and consumer electronics portfolio into the driving experience. Additionally, we look forward to deepening our collaboration with more industry partners in 2025, creating products and solutions that enhance driving safety and better user experience.

Speed of technology development and deployment will be key factors of [our] business success in 2025.

Is there any specific concern or emerging issue you would like to highlight?

The transformation from traditional automotive technology to smart vehicle happens really fast, involving large-scale hardware and software technology that were not used in automotive industry before or have never been used or verified in volume before. At the same time, automotive is still the safety-concerned industry, in which people used to and should always pay [attention to] a severe amount of time and effort on reliability, safety and robustness.

A good balance between the fast adoption of new technology and necessary design and engineering measures to ensure a certain level of safety, security and reliability is one of the highest-priority questions that the whole automotive industry needs to consider and address. With that [being said], a deep understanding of both automotive requirements and computer technology is a MUST to achieve the critical elements needed for a healthy automotive industry.

Loxo

Founded in 2021 and headquartered in Bern, Switzerland, Loxo is a startup specializing in autonomous driving solutions for logistics.

We spoke to Lara Amini, co-founder and chief business officer (CBO).

Key takeaways:

- **Challenges:** Loxo is shifting to a software-as-a-service model, focusing on Digital Driver software and outsourcing vehicle production, which requires redefining its market position and finding the right partners.
- **Developments:** Europe is advancing regulations for autonomous driving by 2025. In logistics, only 4% have adopted automation, but 78% see it as essential for future competitiveness.
- **Outlook for 2025:** Loxo expects significant growth due to favorable regulations in Switzerland and an expanding European presence, setting the stage for scaling autonomous driving in logistics from 2026 onward.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Lara Amini: This year, Loxo underwent a significant strategic shift, repositioning ourselves as a software-as-a-service provider (Digital Driver software provider) rather than an automated delivery service company. This change involves outsourcing the production of the delivery vehicles, presenting both the challenge of redefining our market position and the task of finding the right production partners.

What was the most positive development you witnessed in your sector in 2024?

Across Europe, we are seeing encouraging progress in regulatory developments, with many countries implementing legislation that will pave the way for a wider adoption of autonomous driving by 2025. In the logistics sector, there is also a growing recognition of the need for innovation to remain competitive and drive future growth. While autonomous driving was once primarily associated with personal transport and [original equipment manufacturers], the landscape is evolving, though there remains substantial untapped potential. According to PwC Switzerland, only 4% of logistics companies have begun integrating automation into their fleets, yet 78% acknowledge its necessity for the future.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

I anticipate significant growth for our business, driven by favorable regulatory developments, particularly in Switzerland, and Loxo's expanding presence across Europe. We are leading key projects with strategic partners, and I believe that from 2026 onward, the path will be set for scaling up autonomous driving in logistics.

Meech

Meech manufactures products that address static control and surface cleaning to prevent the consequent contamination and risk this causes within industrial processes. It works with some of the biggest automotive and electric vehicle battery brands in the world.

We spoke to Iain Cameron, marketing director.

Key takeaways:

- **Challenges:** Uncertainty in the market with projects being delayed. Lack of understanding of the impact of surface cleaning on quality and future costs.
- **Developments:** A focus on the highest standards and expanded global reach helped Meech cement its position as industry leaders in contamination removal and static control in the automotive and EV markets.
- **Outlook for 2024:** Continued good, positive interaction at exhibitions in Europe, the US and mainland China. With a focus on innovation for new technologies, it expects to continue its strong sales growth and support for the automotive industry.
- **Emerging issues:** Ongoing requirement for education in the need for surface cleaning in battery production. Lower cost alternatives from other regions that may not have the same production qualities. Unequal market access.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Iain Cameron: Applications for our static control technology span commodities as diverse as body-in-white surface treatments, assembly of electrical components and increasingly, batteries. The latter is a sector gripped by uncertainty. Demand isn't as strong as hoped, with a surplus of batteries, and new assembly facility projects are being delayed.

What was the most positive development you witnessed in your sector in 2024?

Momentum to produce battery cells is building rapidly in Europe and North America, and we can support, at a local level, this increasing number of plants to achieve the stringent environmental requirements necessary. Nearshoring is also leading to more opportunities in Europe as suppliers and OEMs look to derisk supply chains. Whether it is through our existing relationships with key OEMs and suppliers, or at the exhibition shows we attended in Europe, the US and mainland China, slowly there is a better knowledge and understanding of the need for cleaning in battery production. It's particularly vital to achieve the volume, quality and cost targets necessary when you consider the piece price of batteries.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

The outlook will be much the same as 2024, but as the geopolitical landscape settles down, domestically the infrastructure improves and consumer experience of EVs increases, the automotive market should gain confidence and grow. We are ready to meet this demand. Although we don't expect some of our projects to make progress until 2026, we are still cautiously optimistic.

Is there any specific concern or emerging issue you would like to highlight?

While the industry has come to appreciate the need for surface cleansing for prominent ‘A’ surfaces such as body and trim panels, where quality issues are evident, the disruption and rework costs are understood by OEMs. In battery production, however, the impact of static and contamination can be significantly greater and is less widely understood.

We need greater education and understanding of these issues and realization that this is not an area where lower-cost alternatives to surface cleaning are appropriate. It’s important for procurement teams to compare apples to apples when it comes to sourcing equipment; cheaper alternatives may not deliver sufficient performance.

Mobileye

Mobileye specializes in developing autonomous driving and driver-assist technologies, leveraging expertise in areas such as computer vision, machine learning, mapping and data analysis. Its innovations facilitate AI in self-driving vehicles and mobility solutions, support top-tier advanced driver-assistance systems, and provide insights to enhance mobility infrastructure.

We spoke to Dan Galves, Mobileye chief communications officer.

Key takeaways:

- **Challenges:** In 2024, Mobileye faced challenges from inventory corrections and competition from mainland Chinese original equipment manufacturers prioritizing cost over performance, leading to dual procurement strategies that may compromise quality for domestic versus export products.
- **Developments:** Mobileye is advancing next-gen advanced driver assistance system platforms to meet stricter safety standards, partnering with companies such as Volkswagen and Lyft. Progress from competitors such as Waymo drives innovation in self-driving technology, enhancing vehicle autonomy through AI-engineered systems.
- **Outlook for 2025:** Mobileye anticipates strong demand with 50 million units of its sixth-generation EyeQ chips booked. The upcoming EyeQ6 variant and the Mobileye Imaging Radar portfolio promise enhanced automation and improved sensor technology for cost-effective hands-free systems.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Dan Galves: Some of the common challenges facing many auto suppliers impacted Mobileye in 2024. First was the inventory correction in the first half, where our tier 1 partners and OEMs decided the timing was right to clear channel inventory that had been built up as a reserve stock during the peak of the semiconductor shortage. This also affected peers across the industry to one extent or another, but now appears to have normalized.

An additional challenge was incremental competition from domestic mainland Chinese technology players on the pricing side. In general, this was driven by broad retail vehicle pricing pressure in the market combined with strategic directives to localize automotive content, particularly in the semiconductor and software space. Specifically with respect to ADAS content, a lack of stringent performance requirements similar to what exists in [North America] and Europe led to domestic mainland China OEMs preferring price over performance for vehicles sold into the mainland China market. What makes this interesting is that within the mainland Chinese supply base, you have another layer of bifurcation, which is domestic production and export production — it is no surprise to anyone that brands like BYD and groups like Geely have ambitions beyond their home country. The interesting part is that we are seeing a split channel of procurement with our customers. For example, a product may use one semi-supplier for their exported products and another local supplier for their domestic products in mainland China. The rationale is to cut costs wherever possible, which can sometimes lead to diminishing quality. On their export products, they are leading with global suppliers, as safety rating protocols are much more stringent in developed markets outside mainland China as well as a more important consumer buying criterion.

What was the most positive development you witnessed in your sector in 2024?

We saw continued focus on next-generation ADAS platforms for all of our main customers, who wish to encompass additional features that will be required to meet more stringent late-decade safety test protocols. Additionally, a series of deepening engagements on advanced ADAS products that support the vehicle taking over more of the driving indicates that OEMs believe that cutting-edge driving features in this area will be critical to competing in the future.

Additionally, evolved performance by some of our peers in the Level 4 self-driving system space has led to customer engagement tailwinds. It is exciting to watch peers, like Waymo and others, make significant progress in achieving important performance milestones. We are on track with our SDS solution too, called Mobileye Drive. We have active partnerships with Volkswagen, Verne, HOLON and others as our [autonomous vehicle] ecosystem partners. Among multiple positive catalysts, we have also entered into an agreement with Lyft as a partner for their autonomous vehicle ride-hailing network. Ultimately, competition drives progress in the industry, and the latest advances in thinking toward a compound AI-engineered system approach demonstrate how artificial intelligence has enhanced vehicle autonomy capabilities, complementing areas in the legacy software stacks — highly encouraging.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

Optimistic. With the start of production of our sixth generation of EyeQ systems-on-chips, we saw significant demand in the ADAS space, with nearly 50 [million] units booked before the official manufacturing had begun. We have a more powerful EyeQ6 variant that will begin to ramp production in 2025, which will unlock next-generation performance for higher levels of convenience through automation. This makes us eagerly anticipate the year ahead. We also begin production of the Mobileye Imaging Radar portfolio, and those products have surpassed all milestones in the sampling phases. The evolution of radar technology is huge for the industry, as it will push sensor capabilities farther than they are today and, importantly, improve the cost profile of the bill of materials associated with the hands-free, point-to-point style systems of today that are on the horizon for big volume — we're excited to make announcements soon.

Monolith

Monolith empowers engineering teams to build self-learning models, reducing testing time and improving product quality.

We spoke to Richard Ahlfeld, CEO and founder.

Key takeaways:

- **Challenges:** Battery engineers must balance shorter testing timelines with long product lifespans. AI models can accelerate problem-solving, providing automotive leaders with intelligent solutions to enhance efficiency and competitiveness in the fast-paced market.
- **Developments:** Machine learning improves testing and accelerates time-to-market for battery-makers. As they seek efficient validation of complex systems, AI provides confidence in testing adequacy and quickly identifies issues, helping to reduce costly errors.
- **Outlook for 2025:** Battery test labs will increasingly adopt AI to analyze large data sets, optimizing designs and accelerating innovation. This shift will enable faster, safer product development as larger original equipment manufacturers recognize the benefits of AI-driven processes.
- **Emerging issues:** AI is set to transform engineering, similar to CAD in the past. Increasing interest in AI for battery testing suggests that engineers who embrace this technology will gain significant advantages in product development.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Richard Ahlfeld: Battery engineers continue to face a challenging balancing act during development. Realistically, the time frames for testing will always be shorter than how long the product will be out on the market. Take an electric car for instance, an end-user might use a vehicle for around 10 years, but battery engineers won't have the luxury of testing the battery for nearly as long.

They need confidence in the test coverage and long-term quality of the battery, but also face pressures in a highly competitive environment to bring products to market quickly. AI models can learn to solve problems much faster than any human, and that's what automotive leaders are starting to understand.

Of course, there's uncertainty and misunderstanding around AI, but if you have to squeeze what previously took five years into three, engineers need to make the most of the new tools available to them. AI built specifically for engineering offers an intelligent, cost-effective solution for leaders in the automotive industry to gain a competitive edge, faster.

What was the most positive development you witnessed in your sector in 2024?

We continue to see firsthand the power of machine learning in improving testing, enhancing learning, reducing time to market and maximising product quality.

After working on more than 300 AI projects with our engineering customers to look for ways that time-to-market for new designs can be accelerated, the biggest opportunity has been in validation testing of highly complex, dynamic systems with non-linear, intractable behaviour, i.e., electric vehicle batteries.

The challenge has always been to convince engineers to dedicate the time and effort to evaluate a new technology when they’re under so much pressure to get their product into the market. They are so busy and the development process so complex that introducing a new tool can be perceived as risky.

Yet, we’re finding that battery-makers are increasingly open to working with us because they’re spending so much time and money on testing, and just not sure if they’re doing enough or testing the right things — yet the pressure to get to market requires them to move faster than ever before. They can make errors that cost them months if they don’t figure it out quickly. AI gives them confidence that they’re testing the right amount and helps find issues in their test data faster.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

We're going to see battery test labs using AI a lot more in 2025. They're producing terabytes of data per week on chemical composition and design, validation and ageing testing, manufacturing processes, and field monitoring. Machine learning is the only approach capable of analysing these huge data sets within the required timeframes.

For example, in the race to build better batteries, engineers must find designs that are not only high performing, but also manufacturable in the most profitable model. At the same time, they need to reduce time-to-market without risking product safety or brand reputation.

An AI-driven 'high throughput lab' can address these challenges by using test data to identify better designs, optimise test plans and accelerate the innovation process with fewer, more productive prototypes.

Smaller, more nimble startups are already leveraging AI to accelerate their design, testing and manufacturing processes. We expect the bigger OEMs to come on board as they see how incorporating AI tools into their labs results in better, faster engineering processes and better-performing batteries.

Is there any specific concern or emerging issue you would like to highlight?

We see AI as the next wave of digital technology that enables and enhances the engineering process, in the same way that CAD-based design and simulation revolutionised design engineering, becoming mainstream in the 1980s and 1990s powered by the rise of the desktop computer. Similarly, AI and machine learning are in the early stages of engineering adoption, showing promise to accelerate product development on a broad scale.

Therefore, interest and excitement are growing for AI in battery testing and development. The technology is scaling and is being adopted today, and it’s the engineers willing to invest time into making use of this new technology that are soon going to be reaping the rewards.

Nano One

Nano One Materials Corp. (Nano One) is a Canada-based company focused on developing processing technologies for producing battery materials used in electric vehicles, energy storage systems and consumer electronics.

We spoke to Dan Blondal, CEO of Nano One.

Key takeaways:

- **Challenges:** The EV and battery markets are growing slowly due to high interest rates and mainland China's supply chain dominance.
- **Developments:** Nano One is positioned to benefit from the growing lithium iron phosphate (LFP) and energy storage systems (ESS) markets, along with increased government support for the battery supply chain, enhancing opportunities for low-greenhouse gas industrial solutions and domestic midstream growth.
- **Outlook for 2025:** With clarity on US governance, there will be a heightened focus on supply chain security, creating a favorable path for Nano One to leverage its technology's cost and energy, permitting advantages to accelerate growth and secure supply chains.
- **Emerging issues:** Encouraging innovation over old technologies is essential to meet climate goals and stimulate local economies. Coherent policy can help manage challenges in capital projects and lithium-ion supply chains.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Dan Blondal: EV and battery markets continue to grow, yet not at the ambitious pace [that was forecast] a few years ago. Media has responded negatively, and high interest rates have made access to capital challenging. These headwinds are impacting companies, large and small, who are scaling back or even cancelling projects. Mainland China’s head start and dominance in the battery supply chain is an increasingly large barrier to entry. We cannot copy and paste and expect to compete, we must invest in technology and supply chain innovation to differentiate. Through most of 2024, [original equipment manufacturers] and investors were waiting for clarity on election outcomes, policy and tariffs, while ballooning construction costs and permitting inefficiencies continue to exacerbate the localization of supply chains. Despite these headwinds, Nano One is well-positioned with technology that addresses many of the barriers to entry.

What was the most positive development you witnessed in your sector in 2024?

We saw many of the things we predicted years ago starting to come true. We had planned for this and are ready. Specifically, Nano One benefits from the emerging LFP market, the growth of the ESS market, and the growing need for low-[greenhouse gas], wastewater-free and easily permittable industrial solutions. We also saw governments in the US, Canada and other key countries recognize the strategic significance of the midstream of the battery supply chain, which led to policy changes and financially back projects that will further unlock the upstream (mining and refining) and manufacturing. With the election of Mr. Trump, we feel bullish on a domestic midstream flourishing.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

Now that the sector has certainty about who will govern in America, we believe there will be continued if not increased emphasis on [the] security of supply chains, and a clearer and perhaps favourable path for Nano One. Supply chains will be refined and further defined, enabling Nano One to leverage the cost, energy and permitting advantages of its technology to help decouple and secure supply chains to accelerate its growth strategy.

Is there any specific concern or emerging issue you would like to highlight?

We need to continue to encourage innovation and not copy and paste old technologies and supply chains. There are headwinds facing large capital projects and lithium-ion battery supply chains, yet it is manageable if we have coherent and consistent policy. If this can be achieved, we will meet climate change objectives and create significant economic activity locally.

Novelis Europe

Novelis Europe operates as a key player in the automotive aluminum market, leveraging its advanced rolling and recycling facilities across the continent. As a subsidiary of Hindalco Industries Ltd., Novelis is recognized as the world's largest recycler of aluminum and a leading producer of flat-rolled aluminum products.

We spoke to Michael Hahne, vice president Automotive, Novelis Europe.

Key takeaways:

- **Challenges:** Novelis Europe faced challenges managing flood risks, difficult forecasting and high energy costs, impacting operations and strategic planning.
- **Developments:** Circularity drives innovation and green growth in automotive.
- **Outlook for 2025:** To refine strategies amid declining European automotive build rates to enhance efficiency and maintain market strength.
- **Emerging issues:** Political focus on circularity boosts Europe's raw material independence, driving innovation and sustainability in the industry.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Michael Hahne: This year, one of our major challenges was successfully managing the risks associated with a flood crisis in a key automotive plant, mitigating the impact in the best possible manner. In addition, starting in Q3 CY24, forecasting has become increasingly difficult, which has affected our strategic planning and decision-making. High energy costs, coupled with limited political support for energy-intensive industries, also posed significant operational and financial challenges.

What was the most positive development you witnessed in your sector in 2024?

The most positive development in 2024 was the growing importance of circularity in the automotive sector, aligning perfectly with our strategy to increase recycling content and reduce our CO2 footprint. This shift opens up new opportunities for innovation and circular aluminum solutions in the market.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

Looking ahead to 2025, while we anticipate a decline in European automotive industry build rates, we see this as an opportunity to refine our approach. By focusing on enhancing operational efficiency and making strategic market adjustments, we are confident in our ability to navigate these changes and maintain a strong position in the market.

Is there any specific concern or emerging issue you would like to highlight?

A key opportunity lies in the political landscape prioritizing circularity, which will greatly strengthen Europe's independence from raw materials and accelerate sustainability progress. With continued focus, this will drive innovation and long-term resilience in the industry.

Nuro

Nuro, Inc. is an American robotics company founded in 2016 by Jiajun Zhu and Dave Ferguson, both veterans of the Google self-driving car project that evolved into Waymo. Nuro specializes in developing and licensing autonomous technology for delivery and passenger transport.

We spoke to Andrew Chapin, chief operating officer of Nuro.

Key takeaways:

- **Challenges:** In 2024, Nuro transformed by shifting from operating an autonomous delivery service to licensing its technology for delivery and passenger transport.
- **Developments:** Renewed interest in ADAS and AV technology is driving automotive OEMs to re-engage with autonomy.
- **Outlook for 2025:** Nuro is optimistic about 2025, expecting major customer wins for its Nuro Driver system. With recent Level 4 deployment, Nuro aims to establish itself as a key player in the new era of AV commercialization.
- **Emerging issues:** Geopolitical tensions in China challenge the AV and EV industries, complicating the automotive supply chain.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Andrew Chapin: 2024 was a transformational year for Nuro and the autonomous vehicle (AV) industry, as a whole. Both automotive OEMs and mobility providers have felt renewed competitive pressure to have an AV strategy. As the implications for the AV industry have become clearer, so too has the shape of the broader AV ecosystem. At Nuro, we saw this challenge as an opportunity to transform our business from building and operating an autonomous delivery service to licensing our technology for both delivery and passenger transport.

As a company, Nuro has adapted to this changing landscape in several ways. We've doubled down on our core competency of building AV tech. We've worked to sign anchor partners in each of our new verticals, validating our new business model and laying the foundation for an ecosystem where AV players don't own the entire value chain. We've also proven that the Nuro Driver™, our self-driving system, has the technical maturity to allow for mainstream adoption.

What was the most positive development you witnessed in your sector in 2024?

We're seeing a renewed interest in ADAS and AV technology, both from consumers and mobility service platforms. Between 2017 and 2019, automotive OEMs were deeply invested in autonomous R&D and production deployments, but investment waned as deployment timelines became longer than initially hoped. Auto manufacturers are getting serious again about ADAS and autonomy more broadly. Nuro's decision to license its technology was based on industry need. And for this to be fully realized and achieved, mobility providers and automotive OEMs are looking to collaborate with the strongest players in the autonomous vehicle industry, like Nuro, to bring competitive products to market.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

At Nuro, we're very bullish about 2025, and expect to be able to share details about major customer wins for our Nuro Driver system soon. These milestones will highlight Nuro's technological leadership, reinforcing our position in the industry alongside other notable deployments and achievements.

We see 2025 as a pivotal year for AV commercialization, bringing more than a decade of research and development into focus. With our technology's maturity—evident in our recent Level 4 deployment, one of the largest in the US—we believe Nuro is positioned to establish itself as a key player in this new era of AV commercialization.

Is there any specific concern or emerging issue you would like to highlight?

Geopolitical tension in China continues to be a challenge that the AV and EV industries navigate. The automotive supply chain has many links/dependencies to Chinese companies, and an uncertain tariff landscape creates more complexity in building vehicles. Nuro is making great strides in ensuring our supply chain is more resilient to these challenges.

Nvidia

Nvidia Corp. is an American technology company based in Santa Clara, California, specializing in graphics processing units, AI hardware and software, and systems-on-chip for mobile and automotive markets.

We spoke to Philippe van den Berge, vice president of EMEA Automotive Business at Nvidia.

Key takeaways:

- **Challenges:** Nvidia aids the transportation industry in transitioning to software-centric vehicle architectures, enhancing safety and performance while requiring firms to adopt new mindsets and business models throughout the vehicle lifecycle.
- **Developments:** The emergence of AV 2.0 introduces large, unified AI models that manage vehicle stack components like perception, planning, and control. Companies like Wayve are applying this technology using the Nvidia Drive platform to enhance their development efforts.
- **Outlook for 2025:** Nvidia is optimistic about autonomous vehicle development, leveraging generative AI and simulation to enhance safety and performance across three key systems, driving broader adoption of intelligent vehicles like cars and robo-taxis.

The following is an edited transcript of the conversation.

S&P Global Mobility: What were the most significant challenges your business encountered this year?

Philippe van den Berge: Nvidia continues to help the global transportation industry navigate the transition towards more software-centric vehicle architectures. While this transition presents opportunities for enhancing vehicle safety, performance and user experience, it means that firms need to adopt and implement a new mindset, expertise and business models. Nvidia's role is to help automakers and other mobility providers from the cloud to the car innovate and differentiate their products throughout the vehicle's lifecycle.

What was the most positive development you witnessed in your sector in 2024?

One exciting development over the past year has been the emergence of AV 2.0, a new era of AV technology. It features large, unified AI models capable of managing multiple aspects of the vehicle stack, including perception, planning and control. We're seeing practical applications of this technology in action with companies like UK-based Wayve, which is leveraging the Nvidia Drive platform to accelerate their work.

Looking ahead to 2025, how do you perceive your business prospects and the overall outlook?

We're optimistic about the overall outlook for autonomous vehicles. Building safe autonomous vehicle technology is one of the largest, most complex endeavors our company has ever undertaken but it has the potential to transform society by reducing accidents and fatalities, improving roadway efficiency, lowering emissions, and providing mobility for those who can't drive.

Nvidia holds a key role in the development of AVs. Nothing is more exciting to us than overcoming technology challenges, making people's lives better and our roads safer.

Looking ahead, we'll see AVs become increasingly more performant as developers continue to leverage advancements in generative AI. For example, harnessing foundation models, such as vision language models, provides an opportunity to leverage internet-scale knowledge to solve one of the hardest problems in the AV field, namely that of efficiently and safely reasoning through rare corner cases.

More broadly, new AI-based tools are enabling breakthroughs in how AV development is carried out. For example, advances in generative simulation enable scalable creation of complex scenarios aimed at stress testing vehicles for safety purposes. Aside from allowing for testing unusual or dangerous conditions, simulation is also essential for generating synthetic data to enable end-to-end model training.

Effectively, new advances in AI will catalyze AV software development across the three key computers underpinning AV development — one for training the AI-based stack in the datacenter, another for simulation and validation, and a third in-vehicle computer to process real-time sensor data for safe driving. Together, these systems are enabling continuous improvement of AV software for enhanced safety and performance.

In the years ahead, expect broader adoption of this three-computer solution as the automotive industry moves towards increasingly intelligent — and safe — vehicles, from cars and trucks to robo-taxis and beyond.

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