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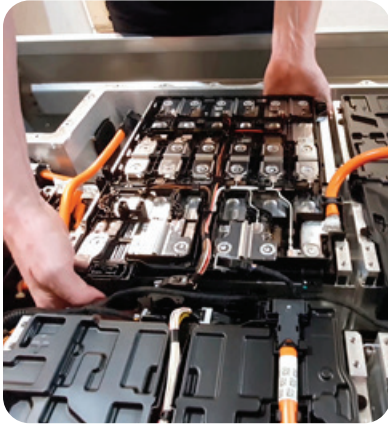
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Alternative Power Report

By *Guy Youngs*, Forecast & Adoption Lead



*Guy
Youngs*

High Energy Density, Cobalt-Free Lithium-Ion Battery Developed

Today's electric vehicles are predominantly powered by nickel-manganese-cobalt (NMC) lithium-ion batteries. However, the inclusion of cobalt in this type of batteries has been considered as problematic due to its anticipated scarcity as well as the associated supply chain risks related to its single source, human rights and mining practices.

Japanese scientists have developed a high energy density, cobalt-free lithium-ion battery that yields about 60% greater energy density than conventional lithium-ion batteries for an equivalent weight and volume and sustains unprecedented 1,000 cycles.

Source: *PV Magazine* [Read The Article](#)

PSR Analysis: The use of cobalt in the current generation of Lithium Ion batteries has several problems notably the use of child labor in a lot of cobalt mines, its scarcity (over 60% of cobalt is sourced from the Democratic Republic of Congo) and its cost. While the battery is not yet ready for commercial use, any move to eliminate this metal (which can cause health issues and is possibly carcinogenic), is welcome. **PSR**

CATL Creates Fast Charging Electric Car Skateboard With 1000 Km Range

CATL, the world's largest battery manufacturer, is not waiting for customers to come knocking on its door to buy batteries for their electric models. It has created what it calls its CATL Integrated Intelligent Chassis, a skateboard design that incorporates all the bits and pieces needed to make a fully functional electric car.

Source: *CleanTechnica* [Read The Article](#)

PSR Analysis: What is interesting here is that CATL is now talking like a Tier One supplier and it's easy to imagine many smaller companies that do not have the resources needed to create electric cars in-house might be tempted to let CATL do the heavy lifting so they can get competitive electrified products to market as soon as possible. All a customer would need to do is mount a body on top of the skateboard to have a finished product that could be sold to retail customers. This is a smart move and likely to move EVs along faster because they can make so many of these cheaply anywhere in the world. **PSR**

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Alternative Power Report
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Record-Low EV Battery Prices in 2023

Thanks to a variety of factors (mostly base economics), lithium-ion battery packs are at record low prices. After dropping 14%, they are down to \$139/kWh vs 2022. Prices for key battery metals, especially lithium, have fallen sharply since January, due to significant growth in production capacity in all parts of the battery value chain, from raw materials and components to cells and battery packs. The steep price drop and record low average price come on the heels of price increases in 2022 that had brought battery prices back to 2020 levels. 10 Years ago, battery packs (including cells) cost \$780 per kWh. These figures represent an average across multiple battery end-uses.

Research by Blomberg and Goldman Sachs suggest that prices will drop further and reach \$80 by 2030.

Source: *Electrek* [Read The Article](#)

PSR Analysis: There has been a lot of talk about battery packs reaching \$100 per kWh as a target and it looks as though this will be exceeded by 2030. This can only be good news for the prices of all EVs as battery costs are a significant contributor to the cost of any vehicle. VW and Tesla (to name just two companies) are already talking about \$25k electric cars. **PSR**

US Discovers Local Lithium Bonanza For EV Batteries

A few years ago, the idea of manufacturing EV batteries in the US was fraught with hurdles, the key issue being the absence of a domestic lithium pipeline. The US had earned a reputation as the biggest producer of lithium in the world, as well as the biggest user of lithium in the world (it was even used in the drink 7Up), but this growth stopped over health concerns and the US dwindled down to just one operation by the time the EV market took off.

The lithium supply chain is still problematic to the extent that it involves digging new surface mines, but an alternative solution has been emerging in the form of geothermal brine, and the US Department of Energy is pulling out all the stops to promote it. In 2020, the US Geological Survey identified five states with major deposits: Arkansas, California, Nevada, North Carolina, and Utah.

The Salton Sea in California has been one key focus of Direct Lithium Extraction (DLE) activity in the US, and now the Department of Energy has put some hard numbers on the lithium resources at hand in this area. The Lawrence Berkeley National Laboratory found that new DLE technology could lead to the production of more than 3,400 kilotons of lithium, or enough to manufacture more than 375 million EV batteries.

Source: *CleanTechnica* [Read The Article](#)

PSR Analysis: While the presence of lithium has been known for years, this is the first time it's been properly analyzed and quantified. While this is great news, the problem that remains is the lack of refineries to process this into the lithium used in batteries. **PSR**

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Energy and the environment are the issues that will redefine the trucking industry over the next decade.

North America Report

Electrify Where It Makes Sense

By *Chris Fisher*, Senior Commercial Vehicle Analyst



Chris Fisher

Energy and the environment are the issues that will redefine the trucking industry over the next decade. That's what Chris Spear, president and CEO of the American Trucking Associations, told a room full of industry experts in November at the annual Cummins-Meritor and Pressure Systems International fleet technology event held in San Antonio, Texas.

But he said the timeline the industry has placed on the adoption of battery electric vehicles (BEV) and to achieve zero emissions are "completely unachievable."

"It takes time. We're not going to get there starting in 2030. We're not going to meet that by 2035. It ain't gonna happen," Spear said, "and when it fails, it's not only going to be embarrassing, it's going to cost a lot of people their jobs. To me, that's just unacceptable."

According to the American Transportation Research Institute, it would take 40% more capacity on the grid to charge every car and truck currently on the road. But our mineral sources – China and the Congo – are not reliable long term, and it would take 10 years of domestic mining for those minerals to reach market, Spear said.

BEV needs to start with vans and step vans, then box trucks, then regional haul/return-to-base operations before long haul can be considered, said Mike Roeth, Executive Director of the North American Council for Freight Efficiency (NACFE).

Spear said the common-sense sequence is starting with vehicles like garbage trucks and school buses and building the infrastructure and power grid around that before expanding.

BEV doesn't make sense for much of the industry right now, not only because of operational parity but also because of cost parity, Spear said. BEVs cost three to four times more than a brand-new diesel truck.

Here is a link to this article: **Source: CCJ Alternative Power**

PSR Analysis: The article does a good job of laying out the on-going barriers to adoption for the transition to zero-emission medium and heavy commercial vehicles. Charging infrastructure and mineral sourcing are likely the most challenging barriers to adoption during the transition phase.

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North America Report
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Not only having the right type of charging infrastructure at the right locations, but also ensuring the power grid is up to the task is crucial to the success of implementing this transition. Domestic mineral sourcing will be a significant challenge to overcome during the mid to longer term. The relatively short timelines to achieve high adoption rates for zero-emission vehicles will certainly be “challenging.” **PSR**



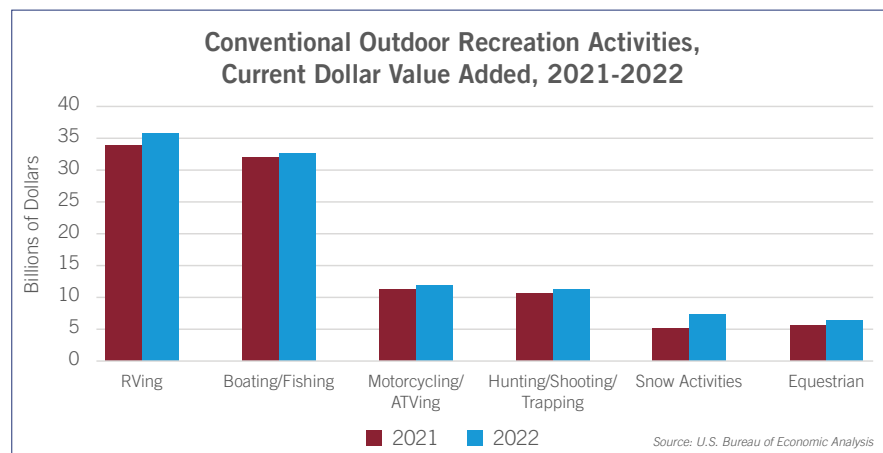
Michael Aistrup

Outdoor Recreation Added \$1 Trillion to U.S. Economy in 2022

By *Michael Aistrup, Senior Analyst*

The U.S. Department of Commerce’s Bureau of Economic Analysis (BEA) recently released economic data from the Outdoor Recreation Satellite Account for the year 2022, showing the largest economic impact in its history and outdoor recreation’s economic impact on the U.S. economy.

These new figures reveal that outdoor recreation generates \$1.1 trillion in economic output (2.2% of GDP), 4.98 million jobs and comprises 3.2% of U.S. employees.



From 2021 to 2022 the GDP contribution from outdoor recreation increased by 4.8% and employment increased by 7.4%, according to the report.

Outdoor recreation remains a significant sector of the U.S. economy. A wide range of activities—from hiking, boating, and hunting to golf and tennis—result in outdoor recreation jobs in a wide variety of industries

Powersports and boating remain key drivers of the outdoor recreation industry. The chart here shows how the outdoor industry continues to grow, supporting jobs and local economies in communities across the country, bolstering the national economy, and providing benefits to an increasing number of Americans.

Here are more noteworthy points from the report for 2022:

- **RVING** was the largest activity for the nation at \$35.5 billion in current-dollar value added and was the largest activity in 22 states. The states with the largest

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North America Report

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“It comes as no surprise that outdoor recreation and the outdoor economy continue to demonstrate outstanding growth,” said Kent Ebersole, president of the Outdoor Industry Association.

contributions were Indiana (\$5.9 billion), Texas (\$3.6 billion), and California (\$3.4 billion).

- **BOATING/FISHING** was the second-largest revenue generator in recreation for the nation at \$32.4 billion in current-dollar value added and was the largest activity in 24 states and the District of Columbia. The states with the largest contributions were Florida (\$4.4 billion), California (\$2.4 billion), and Texas (\$2.1 billion).
- **MOTORCYCLING/ATVING** was the third-largest activity for the nation at \$11.5 billion in current-dollar value added and was the largest activity in Wisconsin. The states with the largest contributions were Wisconsin (\$1.1 billion), California (\$1.0 billion), and Texas (\$877.4 million).
- **SNOW ACTIVITIES** for the nation was \$7.0 billion in current-dollar value added and was the largest activity in three states. The states with the largest contributions were Colorado (\$1.4 billion), California (\$688.2 million), and Utah (\$601.8 million).

“It comes as no surprise that outdoor recreation and the outdoor economy continue to demonstrate outstanding growth,” said Kent Ebersole, president of the Outdoor Industry Association. “This also supports the historic trends in outdoor participation we have seen in recent years.”

The outdoor recreation participant base grew for the eighth consecutive year to a record 168.1 million participants, and new participants are increasingly diverse and looking to businesses to lead on sustainability, equity, and conservation, according to Ebersole.

“This new data demonstrates the strength of the outdoor recreation industry and our collective power to drive sustainable economic growth while protecting and growing access to the benefits of the outdoors for everyone,” Ebersole added. **PSR**

DATAPOINT: North America US Combines 7,100

By Carol Turner, Senior Analyst, Global Operations

7,100 units is the estimate by Power Systems Research of the number of Combines to be produced in North America (United States) in 2023. Final 2023 production numbers will be available later in Q1 2024.

A combine is a farm machine that harvests grain crops. Combines can reap, thresh and winnow crops into a single process. Crops include wheat, oats, rye, barley, corn, etc. Combines overall boost crop output and farm income.

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DataPoint Report

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This product information comes from industry interviews and from two proprietary databases maintained by Power Systems Research: **EnginLink™**, which provides information on engines, and **OE Link™**, a database of equipment manufacturers.

Exports: Collectively, up to 30% worldwide.

Market Share: With 61.5% of total units produced, Deere captured the lead for combine production in North America (US). In second position was Case with 25%; third, was Claas Omaha with 9%.

Trends: In 2022, production of Combines in North America increased nearly 12.5%, climbing from 6,372 units in 2021 to 7,162 units in 2022. Production is expected to remain flat in 2023 with a nominal decrease of less than 1%. The Combine market steadily rose this past year and farmers are upgrading to new machines.

In 2020, Covid-19 factors played a role in the decline of Combine activity, especially for parts availability and drop in orders for new machinery. Sales of combines picked up in Q4 2020 after a tough spring for sales.

Overall, new Combines increase productivity, saving time and labor. Combines generally boost crop output and farm income. “(Sales) increases reflect farmer sentiment about the future of their operations,” says Curt Blades, senior VP of agriculture for AEM. “It’s a really good early indicator of whether folks are enthusiastic about where markets are headed.”

A few years ago, farmers were reluctant to buy or trade in pricey equipment because of lower commodity prices. In 2017, however, production and sales of new combines rebounded following an increase in commodity prices such as corn and soybeans that peaked in 2013/2014. Expect Combine production to increase 5% over the next 10 years. **PSR**

Europe Report

By *Emiliano Marzoli*, Manager European Operations

Kobelco Expands European Headquarters

Brussels, Belgium – Kobelco Construction Machinery, a Japanese firm, is expanding its European headquarters. The firm is relocating its headquarters from Almere to a larger new purpose-built facility in Lelystad.

Over the last 10 years, Kobelco has expanded its European dealer network, and therefore needed a new facility to accommodate the increase in demand for parts and support for end users and dealers.

The new facility will be made up of three main buildings, including warehouse facilities, training center and three-floor office complex. There will also be a demonstration field for Kobelco construction machinery.

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Europe Report

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Source: *World Highways* [Read The Article](#)

PSR Analysis: Kobelco has increased its market share in the European excavator market in recent years. According to the Power Systems Research database OE Link Sales, particularly after Covid, Kobelco outperformed the market demand and added 1% to its market share, positioning the brand as one of the top excavator brands in Europe.

This expansion will help Kobelco build its European volumes even further, and we can expect the company to expand its position in the sales of excavators. Potentially, Kobelco could even reach the European Top 5 excavator suppliers in the next few years. **PSR**

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Brazil/South America Report

By *Fabio Ferraresi*, Director Business Development South America

Argentina Vehicle Production Grew in November



*Fabio
Ferraresi*

After a slowdown in October, Argentina's vehicle production rebounded in November, reaching 56,500 units—an 8.9% increase from the previous month and 6% higher than November 2022.

Yearly production stands at 573,700 vehicles, up 14.8% from the same period last year.

Exports rose 1.5% in the eleven months of this year, totaling 304,000 units. November's 30,300 shipments increased by 6.4% from October but decreased by 3.1% compared to November 2022.

Registrations for the year reached 430,600, a 10.9% increase over 2022. In November, 35,700 units marked a 15% decrease from October but a 15.6% increase from November last year.

Source: *AutoData* [Read The Article](#)

PSR Analysis: Although the market is demanding more than in 2022, part of the growth in November is related to more working days, totaling 21, compared to October. The new government in Argentina also helps to improve the popular optimism which impacts positively on the decision to buy a new vehicle. **PSR**

Brazil Off Highway Machine Sales Continue To Decline

Agricultural machinery sales totaled 49,500 units through October, down 11.8% from the same period last year. In October, 4,900 units were sold, a 25.8% decline from 2022 and 17.7% below September.

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South America Report

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Volkswagen Trucks and Bus announced that it will return in January from collective vacations to resume production in two full shifts, marking a return to a pre-April status.

Year-to-date, 25,400 machines were sold, a 24.2% decrease from 2022. October sales were 2,300 units, down 31.6% from October 2022 and 13.8% from September.

Agricultural machinery exports through October were 7,600 units, down 13.1% from 2022. October shipments totaled 733 units, a 37.4% decrease from the previous year but a 7% increase from September.

Construction machinery exports, with some models exclusively produced in Brazil and strong demand from the United States, increased 11.8% from January to October, totaling 14,100 units. October exports were 1,600 machines, up 15.6% from October 2022 and 21.2% from September.

Source: *AutoData* [Read The Article](#)

PSR Analysis: The reduction in Agricultural Machines Sales is attributed to weather instabilities and reduced commodity prices affecting farmer profitability. The construction machinery sector is facing challenges, following the postponing of government infrastructure projects. **PSR**

VW Trucks and Bus To Restart Two Shifts in January

Volkswagen Trucks and Bus announced that it will return in January from collective vacations to resume production in two full shifts, marking a return to a pre-April status.

Since April, alternating worker groups have managed the production line and remote work, with workers undergoing training courses during off-duty periods. This measure was essential due to a 37.8% decline in truck production and a 35.2% decrease in bus chassis production from January to October.

From January onwards, production will resume at full capacity, assuming positive market expectations.

Source: *AutoData* [Read The Article](#)

PSR Analysis: The temporary layoff in April was aimed to align the plant's production with market demand affected by the transition from Proconve to P8 (Euro V to Euro VI) and the consequent pre-buy. Now, Volkswagen's optimism for 2024 is based on a significant order for 5,600 school buses through the "Caminho da Escola" program and expectations of a GDP increase of 1.5% to 2%. and export markets that are poised for recovery. The order comprises 5,600 units of its vehicles, all powered by the Cummins ISF 3.8L engine and equipped with air conditioning.

In addition to Volkswagen Trucks and Buses, Iveco, Volare, and Agrale secured bids in the auction. Mercedes-Benz, typically a major participant, will not have orders in this phase of the program. **PSR**

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Far East: Japan Report

By *Akihiro Komuro*, Research Analyst, Far East and Southeast Asia



*Akihiro
Komuro*

Honda To End Mass-Produced EV "Honda e"

Honda plans to end production of the Honda e EV by January 2024. This is the company's first mass-produced EV, but sales have been sluggish, falling short of the annual domestic sales target of 1,000 units. Going forward, the company will focus on commercial light EVs, which will be launched in the spring of 2024, to increase the electrification rate of the vehicles it sells.

The Honda e was launched in 2020. The vehicle is priced at 4.95 million yen and has a range of 259 km (WLTC mode). Sales in Europe have already been discontinued. Sales in Japan will also be discontinued once stocks run out.

The Honda e was not originally intended to be a high-volume model, but it did not meet its sales target. The company plans to expand the model lineup, starting with the N-VAN e:, a light electric vehicle to be launched next year.

Source: The Nikkei

PSR Analysis: The Honda e was not in the luxury price range, but with its compact body size it was suitable for Japanese road conditions and with its futuristic design, it was the right approach for the first stage of Honda's EV penetration in Japan. The end of sales of such a flagship model shows the difficulty of EV penetration in Japan.

In the first half of 2023, 22,857 EVs (standard passenger cars) were sold, which is only about 1.67% of the total sales volume. In addition, sales of light EVs totaled 25,807 units in the first half of the year. Therefore, including mini-vehicles, total EV sales were 48,664 units, or 2.38% of all EVs sold (standard passenger cars and mini-vehicles) (PHEVs accounted for 25,163 units, or 1.23%).

Of course, not only Honda, but also Toyota, Nissan, and many other Japanese manufacturers are selling EVs, but there are many issues that need to be resolved before EVs can be widely adopted in Japan.

Weak consumer attitudes form a high hurdle for switching from existing engine models. Manufacturers and the government are promoting V2X and environmental performance, but it will take time for full-scale adoption. **PSR**


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Far East Report

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極東 > 日本レポート:

小室 明大 – 極東及び東南アジア リサーチアナリスト

ホンダ、量産EV「Honda e」の生産終了へ 販売低迷で

ホンダはHonda eの生産を2024年1月までに終了する。同社にとって量産型では初となるEVだが、年間1,000台の国内販売目標を下回り、売れ行きが低迷していた。今後は2024年春に発売する商用の軽EVなどに注力し、販売車両の電動化比率を高める。

Honda eは2020年に発売した。現在販売中の車両価格は495万円で、航続距離は259キロメートル (WLTCモード)。すでに欧州での販売を終了している。国内でも在庫がなくなり次第、販売を終了するという。

Honda eはもともと台数を稼ぐモデルではなかったが、販売目標を達成できなかった。今後は来年以降に発売する軽EV、N-VAN e:などを皮切りに、車種を拡充していく。

参考: 日経 (一部筆者により元記事内容を改編しました)

PSR 分析: Honda eは高級な価格帯ではなく、日本の道路状況に適したコンパクトなボディサイズであり、近未来的なデザインで、日本におけるホンダのEV普及のファーストステージとしては正しいアプローチだった。そうした旗艦モデルの販売終了は、日本でのEVの普及の難しさを現わしている。

2023年上半期のEV (普通乗用車) の販売台数は22,857台となっており、販売台数に対して約1.67%を占めている。さらに、軽EVの販売は上半期で25,807台に上っている。そのため、軽EVを含めると、EVの合計販売台数は48,664台、全販売台数 (普通乗用車・軽自動車) に対するEVの割合は2.38%である (ちなみに、PHEVは25,163台で1.23%)。

もちろん、ホンダだけではなく、トヨタ、日産など、多くの日本メーカーがEVを販売しているが、日本におけるEVの普及には解決すべき課題は多い。消費者のマインドとしては、既存のエンジンモデルからの乗り換えのハードルが高い。メーカーや国はV2Xや対環境性能を啓もうしているが、まだ本格普及には時間がかかると思われる。 **PSR**

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Far East: South Korea Report

By Akihiro Komuro, Research Analyst, Far East and Southeast Asia

Hyundai Motor and Apple May Partner on Self-Driving EVs

South Korea's Hyundai Motor Company and Apple Inc. plan to set up a partnership in the field of self-driving electric cars, according to Korea IT News. And recently another media outlet reported that Hyundai Motor and Apple plan to launch a self-driving EV in 2027.

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Far East Report

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Rumors that Apple is considering entering the EV market are already well known. The story is that the company is considering the possibility of focusing mainly on self-driving.

In response to this news, Hyundai Motor announced that it was in early-stage talks with Apple. On Dec. 10, Hyundai Motor declined to comment on the Korea IT News report, reiterating its statement from Dec. 8 that it had received inquiries from various companies interested in collaborating on the development of self-driving EVs. Apple was not available for comment at the time of our publication.

Source: REUTERS

PSR Analysis: Rumors that Apple is considering entering the EV market are already well known. The story is that the company is considering the possibility of focusing mainly on self-driving. The focus has been on which automakers Apple, with its strong brand, would partner with.

Apple's reasons for developing self-driving EVs are likely to be different from those of automakers. In general, automakers are developing self-driving cars and EVs not only to respond to environmental issues, but also because it is clear that if they do not do so, they will fall behind their competitors and their existing business will not be able to survive.

Apple's position is different. It will not lose its existing business even if it does not make a self-driving EV, and if it is comfortable with an EV that runs normally and well, it will be able to bring it to market more quickly. So why are they considering self-driving? Perhaps because Apple believes it can improve the user experience in the automotive space, as well as solve societal problems.

Whether or not they partner with Hyundai Motor, in any case, if Apple enters the market, it will need to partner with an automaker. Automobile manufacturing is the culmination of advanced industrial technology and requires extremely high safety performance. It would be difficult for even Apple to accumulate such know-how from scratch, and the consideration will probably be accelerated with Hyundai Motor, which already has sufficient knowledge, at the forefront. **PSR**

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小室 明大 – 極東及び東南アジア リサーチアナリスト

現代自とアップル、自動運転EVで提携へ＝韓国メディア報道

韓国の現代自動車と米アップルは自動運転EV分野での提携で正式合意する予定だ。韓国紙コリアITニュースが伝えた。先週、現代自とアップルが2027年に自動運転EVの発表を目指していると別のメディアが報道。これを受け、現代自はアップルと初期段階の協議をしていると発表していた。現代自は10日、コリアITニュースの報道についてコメントを拒否した上で、自動運転EVの開発で様々な企業から協力を念頭とした要請を受けているとする8日の説明を繰り返した。アップルのコメントは現時点で得られていない。

参考: REUTERS (一部筆者により元記事内容を改編しました)

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Far East Asia Report

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PSR 分析: アップルがEV市場への参入を考えている噂はすでによく知られている。主に自動運転を軸に検討を進めているという話だ。強力なブランドを持つアップルがどの自動車メーカーとタッグを組むか、は注目されてきた。

アップルが自動運転EVを作る理由は、自動車メーカーのそれとは異なると思われる。一般の自動車メーカーが自動運転車やEVの開発を進めるのは、環境問題への対応はもちろん、そうしなければ他社の後塵を拝し、既存のビジネスが立ち行かなくなることが明らかだからだ。しかしアップルの立場は異なる。自動運転EVを作らなくても既存ビジネスを失うことはないし、普通によく走るEVでよければ、もっと早く市場に出すことができるだろう。では、なぜ自動運転を検討しているのか。アップルは自動車分野のユーザー体験を改善し、社会的な問題を解決できると考えているためだろう。

現代自とパートナーになるかどうかはさておき、いずれにしてもアップルが市場参入する場合は、アップルは自動車メーカーと組む必要がある。自動車製造は高度な工業技術の結晶であり、極めて高い安全性能が求められる。アップルといえどもそうしたノウハウをこれからゼロベースで積み上げるのは難しく、すでに十分な知見を持つ現代自を筆頭に検討は加速していこう。 **PSR**

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India Report

By *Aditya Kondejkar*, Research Analyst – South Asia Operations.



Aditya Kondejkar

Mahindra Plans To Double Tractor Exports in 20hp-40hp Range

"Our aim is that with the launch of Oja (platform), we will double our export in the next three years," says Hemant Sikka, president of Mahindra's farm equipment sector. "So, we want to increase exports from 18,000 to 36,000 in about three years."

In collaboration with Mitsubishi Mahindra Agriculture Machinery, Japan, and an investment of INR 1200 crore, the new Oja platform could help Mahindra win 25% of the worldwide tractor demand. This includes tapping into new markets such as Europe and ASEAN, as well as strengthening its presence in sectors like horticulture.

Source: *Economic Times* [Read The Article](#)

PSR Analysis. The launch of Mahindra Tractors' new Oja platform underscores a strategic move with several critical business implications. First, the entry into the 80,000 unit ASEAN market represents an expansion initiative, targeting countries such as Thailand, Indonesia, and the Philippines. This move aligns with the company's global growth strategy, capitalizing on the increasing demand for tractors in these emerging markets.

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India Report

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Second, the Oja platform's focus on the growing horticulture segment in India and wet paddy fields in Southeast Asia reflects a keen understanding of regional agricultural needs. By tailoring the platform to address specific agricultural practices, Mahindra aims to solidify its market position and meet the evolving demands of farmers in these regions.

Furthermore, the company's new focus on European markets, with a sharp interest in vine-growing countries like Germany, Italy, and Spain, adds another layer to its expansion strategy. This move indicates an understanding of regional agricultural nuances and a targeted approach towards markets with specific agricultural landscapes. By strategically eyeing European markets, Mahindra plans to leverage the Oja platform to capture market share in specialized segments, thereby enhancing its global footprint.

Moreover, the strategic decision to target personal buyers in the mature markets of the US and Europe indicates a broader effort to diversify its customer base. This expansion beyond traditional agricultural markets suggests a forward-thinking approach to market penetration, recognizing opportunities in evolved economies and potentially reducing dependency on specific market segments.

In summary, Mahindra's introduction of the Oja platform is a business strategy that encompasses both geographical expansion into high-potential markets and a nuanced product approach to cater to diverse agricultural practices. This positions the company for global competitiveness and resilience in the ever-evolving agricultural machinery industry. **PSR**

Russia Report

By *Maxim Sakov*, Market Consultant, Russia Operations

Editor's Note: Power Systems Research has paused all research and business development activities in Russia. We maintained an important presence in Russia from 2013-2022 to bring important updates to our clients about the powered equipment markets within Russia. We are continuing to monitor the current situation and hope to again establish this presence when the conflict with Ukraine is resolved. Please contact us at info@powersys.com if you have questions regarding business conditions in Russia. Thank you. **PSR**

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