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Power Systems Research (PSR) is a world leader in providing power equipment information, whether it's pure data, analysis, forecasting or specific business intelligence. This product information ranges from IC engines to battery-electric and hybrid powertrain technologies. PSR has been providing world class business and market intelligence to industry leaders for 45 years. How can we help you? For details, call **+1 651.905.8400** or email **info@powersys.com**.
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Editor's Note: *This issue of PowerTALK News contains our newest feature, the Alternative Power Report, written by Guy Youngs. This monthly feature includes news and analysis about EV and power sources such as batteries and fuel cells.*

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Alternative Power Report

By Guy Youngs, Forecast & Adoption Lead

Guy Youngs

Are There Enough Materials To Manufacture The Needed EVs?

The transition from ICE to electric vehicles (EVs) is necessary to decrease climate-changing emissions. As deployment increases, so will the demand for EV battery materials such as lithium, cobalt, and nickel. These materials are primarily supplied through two sources: 1) newly mined or 2) recovered by recycling batteries.

Research shows there are enough explored or prospective reserves to electrify the global transportation sector using current technology if a high amount of battery recycling occurs. In this scenario, global demand for EVs in 2100 will amount to about 55% of cobalt reserves and 50% of lithium reserves. If recycling doesn't ramp up, a shortage of lithium, nickel, or cobalt is likely, and it is estimated that demand would exceed what is economically accessible to extract.

In this scenario, demand in 2060 is more than cobalt reserves and about 90% of lithium reserves

Source: *Cleantechnica* **Read The Article**

PSR Analysis: Without recycling, demand for Lithium will be such that prices (which have already risen dramatically) will continue to grow, meaning battery costs will escalate. Nickel and Cobalt cost impacts can be reduced by switching to low density batteries such as Lithium Iron Phosphate batteries but this results in a lower range battery.

Lithium, on the other hand, is more problematic and recycling is vital. Recycling isn't a requirement yet, so recycling is done on a purely economic basis, but we should expect recycling policies to come into force soon. In fact, California is already actively exploring such policies, and a group of stakeholders recently submitted policy recommendations to the California legislature. **PSR**

Redwood To Supply Cathode Materials To Panasonic

Panasonic Energy said it has agreed to purchase cathode active materials and copper foil for lithium-ion batteries from Redwood Materials. The recycled cathode active materials will be used to manufacture batteries in the company's new $4 billion factory located in De Soto, Kansas, starting in 2025, and the recycled copper foil will be used to make batteries at Panasonic's facility in Sparks, Nevada, starting in 2024.

"Recycling and a localizing supply chain are both essential to make the best use of limited natural resources," said Kazuo Tadanobu, President and CEO of Panasonic Energy, in a press release.

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Alternative Power Report

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This may amount to 50% of the cost of the battery and add around 900 new workers to Redwood Materials workforce once in full scale production

Source: *Cleantechnica* **Read The Article**

PSR Analysis: Without recycling, demand for Lithium will be such that prices (which have already risen dramatically) will continue to grow, meaning battery costs will escalate hugely. Previous article (***Are There Enough Materials To Manufacture All The Electric Vehicles Needed?***) points to the essential nature of the recycling for batteries, and this is a very good example of recycling on an economic basis rather than a result of policy / legislation. **PSR**

Tesla Lithium Refinery Project Advances in Texas

Tesla is currently working on a lithium refinery project that may be coming to Corpus Christi, Texas, and it sounds like the automaker is in the final stretch of its negotiations with the authorities.

In September, we learned that Tesla has a plan to build a lithium refining facility on the Gulf Coast of Texas. At the time, all we knew was that Tesla was planning on moving fast with hope to start building in Q4 2022.

Tesla will process raw ore material into a usable state for battery production. The process Tesla will use is innovative and designed to consume less hazardous reagents and create usable by-products compared to the conventional process. Tesla made it clear that the final product from this new plant will be battery-grade lithium hydroxide and shipped by truck and rail to Tesla battery manufacturing sites, supporting the necessary supply chain for large-scale and electric vehicle batteries

Source: *Electrek* **Read The Article**

PSR Analysis: This is another positive step towards a circular supply chain for Lithium and a way for Tesla to secure a supply of battery grade lithium by vertically integrating this process. This move is significant for Tesla, but it is also significant for the industry because where EVs are concerned, Tesla often leads the way. **PSR**

Here's What Container Ships Could Look Like by 2050

With pressure from regulators to decarbonize international shipping, companies big and small are racing to identify green alternatives to the gas-guzzling container ships that account for an estimated 3% of global greenhouse emissions.

Many of the ideas floating around today leverage some form of high-tech sail, a futuristic take on the wind-powered voyages that have transported goods for as long as global trade has existed.

Many factors need to be considered when designing a wind-powered cargo ship, including safety, functionality, crew comfort, and most importantly, speed.

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Alternative Power Report

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Marine transport is a significant contributor to global carbon emissions so any movement to reduce the emissions is positive, and if it happens to reduce the fuel costs for marine transportation at the same time, there is a substantial saving to be made.

Source: *MSN* **Read The Article**

PSR Analysis: Marine transport is a significant contributor to global carbon emissions (see article "*EV shipping is set to blow internal combustion engines out of the water*" in the September issue of *PowerTALK*), so any movement to reduce the emissions is positive, and if it happens to reduce the fuel costs for marine transportation at the same time, there is a substantial saving to be made. A real win-win situation. Further information about these can also be found **here**. **PSR**

North America Report

By Chris Fisher, Senior Commercial Vehicle Analyst

More Acquisitions in Light/Medium EV Segment

Chris Fisher

2022 has been an interesting year on many commercial vehicle fronts including the medium and light electric commercial truck and van segment. While large established OEMs such as Ford, who is expected to produce approximately 6,500 E-Transits at the Kansas City plant in 2022, there has been some shakeup within the electric commercial vehicle start-ups.

During the past six months, Mullen Automotive, based in Brea, CA, has acquired the assets of the now bankrupt Electric Last Mile (ELMS) company and has acquired 60% of Bollinger Motors, which has yet to start vehicle production.

In September 2022, Mullen Automotive invested $148 million into Bollinger Motors, giving Mullen a 60% share of the company. Bollinger plans on introducing their electric class 3 – 6 lineup of cargo vehicles starting in 2023 and it is likely that Bollinger will also manufacture the Mullen electric light commercial vans also starting production in 2023.

Production of the commercial vehicle lineup will take place at the Mullen plant in Tunica, MS. The Mullen light electric vans will likely fill the void left by Ford discontinuing sales of the Transit Connect in the United States by the end of 2023 primarily due to falling sales and a dispute over import duties.

In June 2022, Electric Last Mile (ELMS) declared bankruptcy and in October Mullen Automotive acquired the ELMS production facility in Mishawaka, IN, along with ELMS's inventory and intellectual property. Mullen plans to introduce their electric passenger vehicle crossover which will be known as Mullen Five in 2024 and ultimately introduce the Bollinger B1 and B2 pickups into production.

It appears the Mishawaka plant will be dedicated to Bollinger and Mullens passenger vehicle production.

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North America Report

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While the class 1 – 6 last mile commercial van and truck segment is a great fit for electrification, time will tell if Mullen Automotive will have enough financing and technical capability to be a significant player in the market or will they end up being another start-up that will ultimately get purchased by another OEM in the next few years. **PSR**

Source: Mullen Automotive

U.S. Powersports Industry Grows in 2021

By Michael Aistrup, Senior Analyst

Michael Aistrup

The U.S. Department of Commerce's Bureau of Economic Analysis (BEA) has released economic data for 2021 showing the outdoor recreation industry's impact on the U.S. economy. Key highlights from the 2021 data on the outdoor recreation economy:

- $862 billion in economic output
- 1.9% of GDP
- 4.5 million jobs

Trips and travel have come back, record sales in many outdoor segments, manufacturing increasing, as well as the drive to continue to recreate for quality of life has allowed the outdoor industry to bounce back from the effects of COVID-19.

"The continued strength of the outdoor economy is no surprise to the marine industry, where we continue to see incredible growth with new and younger customers taking to our brands each year," said Chris Drees, President of Mercury Marine, the world's leading manufacturer of recreational marine propulsion engines."

Travel restrictions during the pandemic encouraged people to find recreational and fun closer to home and those new habits have not faded away. As flexibility in the job market has become more consistent, more workers have participated in outdoor activities.

Recreational sales and manufacturing highlights, according to the government report:

- New model powersports sales increased 18.4% in 2020
- Sales of ATV's also jumped, rising 33.8% over 2019 levels
- 40% of new boaters purchased a boat in 2020
- More than 310,000 new powerboats were sold in 2020
- 95% of boats sold in the U.S. are American made
- Motorcycle riding in U.S. generated $64 billion in total revenue and 480,000 jobs
- Wheel sports in the U.S. was responsible for $95 billion in total revenue and 847,000 jobs

The outdoor recreation industry, which played an important economic and social role during the pandemic, remains a steady source of strength nationally and a job creator locally. **PSR**

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North America Report

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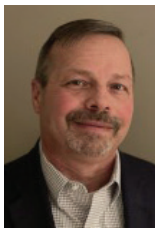
PSR Podcast: Michigan Solar Car Program

By John Krzesicki Business Development Manager

Power Systems Research clients and their suppliers are going through a significant paradigm shift as they move from producing internal combustion engines to developing alternative power sources.



John Krzesicki

Today's designs incorporate technology and software that are more innovative, competitive, and efficient. Our clients are looking for cutting-edge alternative power to power their equipment.

Power Systems Research has produced a podcast with the University of Michigan Solar Car team which discusses this innovative and successful program. This podcast shares the rich history and challenges of participating in the Solar Car Program. **Listen to the Michigan podcast here. PSR**

DATAPOINT: *North America Terminal Tractors*

3,800

By Carol Turner, Senior Analyst, Global Operations

3,800 units is the estimate by Power Systems Research of the number of Terminal Tractors to be produced in North America (United States) in 2023.

Terminal Tractors are specialized heavy duty vehicles designed to move loads at container ports and container terminals. Generally, they are slow moving (under 30km/h) and employ a high torque diesel engine and 4x4 wheel drive which enables them to move very heavy trailer loads, sometimes up to 200 or 300 tons

This 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 40% worldwide

Market Share: With 31% of total units produced, Tico leads in production of Terminal Tractors in North America. In second position is Kalmar–Ottawa with 26%; third is Capacity Trucks with 19%.

Trends: In 2021, production of Terminal Tractors in North America increased nearly 16% over 2020 production. Production is expected to gain another 22.5% in 2022. Over the past few years, airlines have tightened expenditures and reduced purchases of Terminal Tractors. This is is based on the poor performance of the industry with no leftover monies for new units due to tight or minimal budget constraints.

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The production increases in 2021 and 2022 are the result of increased demand for new products that improve operational efficiency and reduce environmental impact.

2018 was an exceptional year in the North American Terminal Tractor industry. Hesitations of increase in prices from additional tariffs and trade wars made several customers bring forward orders, resulting in significant growth in sales for most manufacturers. Production is expected to remain steady with an additional increase of 10% by 2025. **PSR**

Brazil/South America Report

By Fabio Ferraresi, Director Business Development South America

Royal Enfield Starts Assembly Plant in Brazil

Fabio Ferraresi

Royal Enfield has started its first assembly line in South America to produce motorcycles. The plant is located in Manaus-AM, Brazil and is the fourth in the world to operate under the CKD system.

Capacity is set at 15,000 motorcycles per year and the line is able to produce any of the models in the current global product portfolio.

Source: *Automotive Business* **Read The Article**

PSR Analysis: Assembly in Manaus is a move to reduce import taxes and improve competitiveness of the product in Brazil. Manaus already has Honda and other motorcycle manufacturers; it has a capable workforce and a complete production support ecosystem to support Royal Enfield's assembly operations.

BorgWarner To Produce Vehicle Batteries in Brazil

BorgWarner said it will start producing battery systems for electric vehicles in Piracicaba-SP, Brazil, by Q1 2023 with declared annual capacity of 1,000 electric units.

The plant in Piracicaba formerly belonged to Delphi and was acquired by BorgWarner in 2020. The plant will receive a production line from Akasol, another company acquired by BorgWarner.

The first customer of the battery plant is Mercedes Benz, which produces MHV in Brazil.

Piracicaba will receive UHE battery packs from Akasol in Darmstadt, Germany, and will add components produced in Brazil. These components include electronic modules, DCCUs, connection boxes and metallic structural components.

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South America Report

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John Deere has just announced an investment of US$ 35 million (R$ 190 million) in the production facilities for its Construction Division, two manufacturing units located in Indaiatuba, in the interior of São Paulo.

Source: *Automotive Business* **Read The Article**

PSR Analysis: The first destination for the batteries will be buses produced by Mercedes Benz in 2023. This national content is a requirement to provide access to low interest funding lines through FINAME, from BNDES, the Brazilian National Bank for Economic and Social Development.

John Deere Plans Construction Equipment Plant in Brazil

John Deere has just announced an investment of US$ 35 million (R$ 190 million) in the production facilities for its Construction Division, two manufacturing units located in Indaiatuba, in the interior of São Paulo. The goal is to expand capacity to meet the growing demand for machines and to implement its Smart Connected Factory program, or Industry 4.0, which encompasses technologies to increase efficiency, quality in processes and reduce operating costs.

Source: *Investe São Paulo* **Read The Article**

PSR Analysis: John Deere is reaching production capacity with the huge growth of demand for Construction Equipment in Brazil in recent years. This demand should continue and should keep increasing with the planned Infrastructure Investments and the continued expansion of the Mining business. Moreover, the strategy of localization, making products in Brazil rather than importing, making Brazilian plants a hub for exports, needs continued investment. **PSR**

Europe Report

By Emiliano Marzoli, Manager European Operations

Solaris Buses Purchases 25 Fuel Cell Engines

Emiliano Marzoli

Ballard Power Systems has announced the sale of 25 hydrogen fuel cell engines to repeat customer Solaris Bus & Coach, a leading European bus manufacturer.

The 70kW fuel cells will be installed in Solaris' Urbino 12 hydrogen buses for deployment to Polish public transport operator MPK Poznań and are expected to be delivered in H2 2023.

The buses are to be partially funded by the National Fund for Environmental Protection and Water Management's Green Public Transport program. MPK Poznań requires 30% of its fleet to be zero-emission by 2028. These 25 hydrogen fuel cell buses will increase its zero-emission fleet from 18% to 25%.

Source: *Ballard* **Read The Article**

PSR Analysis: Both Ballard and Solaris are among the major contributors to the increase of fuel cells buses in Europe. While Fuel Cells have the smallest share

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among busses manufactured in Europe, we believe that in 2032 they will more than quadruple their volumes compared to 2021. Besides, battery powered buses will also grow at double digits, leaving the ICE buses market to shrink at a -3% CAGR in the next decade.

We expect BYD, Volvo, VDL, Scania and Daimler to be the major battery powered bus suppliers, while Solaris will be one of the most important brands for fuel cell vehicles between now and 2032. **PSR**

China Report

By Jack Hao, Senior Research Manager - China

2023 EV Sales Forecast To Grow To 8.4 Million Units

Jack Hao

The development trend for the new energy vehicle (EVs) market remained positive through 2022. In November, retail sales of new energy passenger vehicles reached 598,000 units, with a year-on-year growth of 58.2%. From January to November, the domestic retail sales of new energy passenger vehicles were 5.03 million units, with a year-on-year growth of 100.1%.

As for December, the Passenger Transport Federation believes that the subsidy for new energy vehicles will decline by 12,600 RMB this year, which is much more than the decline of 5000 RMB in the previous two years. In addition, some vehicle enterprises have announced a price increase for next year, which may promote strong pre-buying of new energy vehicles at the end of the year and boost sales.

This year, the new energy vehicle market is expected to achieve the annual sales of 6.5 million vehicles.

Although the subsidy for new energy vehicles will be withdrawn at the end of this year, the exemption for the new energy vehicle purchase tax will continue next year.

At the same time, the new energy vehicle market is still good under the effect of non-financial means, including the right of way. Cui Dongshu predicted that the sales volume of new energy vehicles in China would reach 8.4 million in 2023, with a year-on-year growth of more than 30%. "With a high penetration rate of 36% in November this year, the new energy vehicle market has entered a supermarket driven stage.

Source: *The Paper* **Read The Article**

PSR Analysis: At present, new energy vehicles have entered the stage of accelerated growth, and the process of replacing fuel vehicles has been accelerated. Due to the expanded sales of new energy vehicles, unit costs also have been gradually reduced. At the same time, China has gradually canceled

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epidemic prevention and control measures, which has injected confidence into the car market again and is expected to boost sales.

Presently, exports of Chinese independent brands to European and American markets and developing countries is accelerating. Sales of international brands to China's base is increasingly, and this growth rate will remain strong for new energy vehicles.

Car ownership in China has reached 315 million units and 223 units per 1000 people. Compared with 600 units per 1000 people in developed countries, China's car market still has a lot of room for growth. The annual sales volume is expected to reach 40 to 50 million units in the future.

Given the government's dual carbon strategy, the trend of automobile market electrification seems to be irreversible, and new energy vehicles will gradually replace the stock of fuel vehicles.

Second, maturity of the supply chain system of new energy vehicles will lead to a decline in the cost of new energy vehicles.

Third, with the progress of electrification technology and intelligent technology, the product strength of new energy vehicles will be further improved, the energy supplement facilities will be gradually improved, and the appeal to consumers will be further enhanced. The market penetration rate of domestic new energy passenger vehicles will further increase, and it is expected to reach 46% and 54% in 2025 and 2029, respectively. **PSR**

Far East: Japan Report

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

Honda To Produce FCVs in the U.S. in 2024

Akihiro Komuro

Honda announced that it will produce electric fuel cell powered vehicles in the U.S. in 2024. They will also be equipped with a plug-in function that allows them to be recharged externally. Honda has set a goal that all new vehicles sold by 2040 will be either EVs or FCVs.

In North America, its main market, Honda will offer FCVs as an option. The new FCV to be produced is based on the CR-V SUV model and will be manufactured in small quantities at the Performance Manufacturing Center in Ohio. The plant had produced the Acura NSX sports car until November. Since the plant has not yet developed a sufficient hydrogen supply base, it will be a plug-in FCV that can also be recharged externally. This is said to be the first production vehicle in North America to adopt such technology.

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Honda has been developing FCVs for some time, introducing the FCX in 2002 in Japan and the United States. In Japan, it launched the FCV model Clarity Fuel Cell in 2016.

Honda has been developing FCVs for some time, introducing the FCX in 2002 in Japan and the United States. In Japan, it launched the FCV model Clarity Fuel Cell in 2016. However, due to sluggish sales, the company discontinued production of this vehicle in Japan in 2021.

Source: The Nikkei

PSR Analysis: Plug-in FCVs can run on electricity, fed by plug-ins, where there are no hydrogen stations. If FCVs are to be popularized at a stage where the hydrogen filling infrastructure is weak, a plug-in that can be charged from an electrical outlet may be the best combination. After filling up at a hydrogen station, which might be located far away, the vehicle could be operated by recharging its battery, and the hydrogen could be used as a range extender in case of power shortages. Of course, if a hydrogen station were to be established in the same neighborhood, it would be possible to switch to the same operation as at a gas station. The biggest barrier to sales expansion is the price. In the price competition, FCVs will probably lose out to BEVs. The availability and scale of subsidies for FCVs will have a significant impact on sales. **PSR**

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、米国で燃料電池車を生産　2024年に

ホンダは2024年に米国でFCVを生産すると発表した。外部から充電できるプラグイン機能も搭載する。ホンダは2040年に新車販売の全てをEVかFCVにする目標を掲げている。主要市場である北米で、顧客に対しFCVも選択肢の1つとして提示する。新たに生産するFCVは、SUVモデルのCR-Vをベースにし、オハイオ州のパフォーマンス・マニュファクチャリング・センターで少量生産する。同工場では11月までスポーツカー「アキュラNSX」をつくっていた。水素の供給拠点がまだ十分に整備されていないこともあり、外部からの充電もできるプラグインFCVにする。こうした技術を採用するのは、北米の市販車としては初という。

ホンダはFCVの開発を進めてきた。2002年にはFCXを日本と米国に投入。日本では2016年にFCVモデル「クラリティ　フューエルセル」を発売した。ただ販売台数が低調だとして、2021年に同車の日本生産を終了していた。

PSR 分析: プラグインFCVは、水素スタンドが無いところではプラグインによる給電で、電気で走行できる。水素充填インフラが脆弱な段階でFCVを普及させたいなら、コンセントから充電できるプラグインが最善の組み合わせなのかもしれない。遠くにあるだろう水素スタンドで満充填した後、普段は家や駐車場等での充電で運用して、水素は電欠時のレンジエクステンダとして使用する、と

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いった使い方が想定できる。もちろん、生活圏に水素スタンドができたらガソリンスタンドと同様の運用に切り替えが可能だろう。拡販への最大の障壁は販売価格だ。BEVとの価格競争ではBEVに負けるだろう。FCVへの補助金の有無や規模が大きく影響するだろう。

参考: 日経 (一部筆者により元記事内容を改編しました)

Far East: South Korea Report

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

Korea's SK Battery To Supply Hyundai's U.S. Plant

Korean battery giant SK Innovation announced that it will expand its supply of batteries to Hyundai Motor Group in North America, and the two companies will discuss the construction of a joint venture plant to increase supply after 2025. SK Innovation says it plans to support Hyundai Motor Group's increased EV production in North America.

In addition to EV production at its existing Alabama plant, Hyundai Motor plans to start operations of a dedicated EV plant in Georgia by 2025. Kia Motors, a group company, will also increase EV production in Georgia, as stable procurement of batteries, a key component of EVs, has become an issue.

SK On, a battery subsidiary of SK Innovation, already supplies batteries for Hyundai Motor's mainstay Ioniq EV series. In the U.S., SK On produces batteries at its existing Georgia plant, and after consulting with Hyundai Motor, the company will decide whether to expand the plant or establish a new joint venture plant.

SK, a latecomer in the automotive battery field, has been losing money due to heavy upfront investment, and will promote the construction of a joint venture plant that can share the investment burden with the car giant. With Ford Motor Company, SK is building two joint plants in the U.S. and one in Turkey.

The three major Korean battery companies, SK, LG Energy Solutions, and Samsung SDI have announced a series of battery plant construction projects in North America. The U.S. government has indicated a policy of allocating subsidies and tax credits for EVs produced in North America. The U.S. government is planning to provide tax credits for EVs produced in North America, and if the batteries are not produced in North America, the tax credit will be reduced, and the car giants are encouraging battery manufacturers to expand production in North America.

Source: The Nikkei

PSR Analysis: SK and Hyundai are accelerating their battery strategies in the North American market in order to take advantage of tax credits under the U.S.

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Inflation Control Act. The development of a production system in North America, a large market, will contribute significantly to the densification of the component supply chain, and will also reduce transportation and other costs. **PSR**

極東 > 韓国レポート:

小室 明大 – 極東及び東南アジア リサーチアナリスト

韓国SK、現代自の米国工場に電池供給を拡大

韓国電池大手SKイノベーションは、現代自動車グループに対して北米での電池供給を拡大すると発表した。2025年以降の供給増に向けて、両社で合弁工場建設などを協議する。現代自グループの北米でのEV増産に対応する。

現代自は既存のアラバマ工場でのEV生産に加えて、2025年をメドにジョージア州でEV専用工場を稼働させる計画を持つ。さらにグループ企業の起亜もジョージア州でEV生産を増やす。EVの基幹部品である電池の安定調達が課題となっており、SKとの関係を深めて北米でEV生産体制を確立する。

SKイノベーションの電池子会社SKオンは既に現代自の主力EV「アイオニック」シリーズなどに電池を供給している。米国では既存のジョージア工場で電池生産しており、現代自と協議した上で工場増設や合弁工場の新設などを決める。

車載電池分野で後発のSKは先行投資がかさむため赤字が続いており、車大手と投資負担を折半できる合弁工場建設を推進する。米フォード・モーターとは、米国で2カ所、トルコで1カ所の合弁工場を建設中だ。

SKとLGエネルギーソリューション、サムスンSDIの韓国電池大手3社は北米で電池工場建設を相次ぎ発表している。米政府は北米生産のEVに対して補助金を充てて税控除する方針を示す。電池も北米産でなければ控除額が減る仕組みで、車大手側は電池メーカーに北米での生産拡大を促す構図となっている。

出典: 日経（一部筆者により元記事内容を改編しました）

PSR 分析: 米国のインフレ抑制法による税控除を狙って韓国のSKと現代が北米市場におけるバッテリー戦略を加速させている。EVにおけるコアコンポーネントであるバッテリーの供給網を米国で整備することによって得られるのは税控除だけではない。大きな市場である北米における生産体制の整備は、部品サプライチェーンの高密度化にも大きく貢献することになり、また輸送費などのコスト減も期待できる。**PSR**

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India Report

By Aditya Kondejkar, Research Analyst – South Asia Operations.

A favorable mix of factors is propelling demand for commercial vehicles to their best-ever pre-COVID-19 volumes in India.

CV Production Nears Pre-COVID Levels

Aditya Kondejkar

A favorable mix of factors is propelling demand for commercial vehicles to their best-ever pre-COVID-19 volumes in India. Even though the CV segment has not reached its 2018 peak, it is expected to grow by double digits in the current fiscal year.

This growth is based on healthy demand and a relatively low base last year. While the sales are in green for all the major OEMs, market leader Tata Motors has reported year-over-year drop of 3%.

Source: *Auto News* **Read The Article**

PSR Analysis. The positive growth trends were seen across the three sub-segments - M&HCV, LCV and passenger carriers. Each of these segments reported robust growth in production in Q2 as well as H1 FY23. However, headwinds such as increasing fuel prices, the evolving geopolitical situation, and higher interest remain, they are not expected to create major roadblocks to domestic CV sales

The production spike was aided by replacement demand, increased government spending on growth sectors like infrastructure, back-to-office and school situations, and increased e-commerce demand. Further, the stability in freight rates is also leading to greater fleet viability for CV fleet operators.

Holdover of new purchases over the past 2-3 years because of a multitude of factors like revised axle-load norms, macroeconomic slowdown, COVID-19, etc. had resulted in significant ageing of the in-service population. In FY22, the average age of M&HCVs and LCVs was estimated at about 10 and 5.5 years, respectively, at historic highs.

Additionally, many organizations are increasingly mandating fleet operators to deploy cleaner, newer, and technologically superior vehicles. This would also propel the replacement demand. Hence, we believe replacement demand will play a key role in the higher production of MHCVs.

On the other hand, the LCV segment would continue to grow banking on the growing e-commerce and agri sector. The LCV truck segment will continue its growth story. Increased requirements for last-mile transport, especially in e-commerce, will drive the demand in this segment. of tourism, reducing risk aversion towards public transport, would support volumes in the sector. **PSR**

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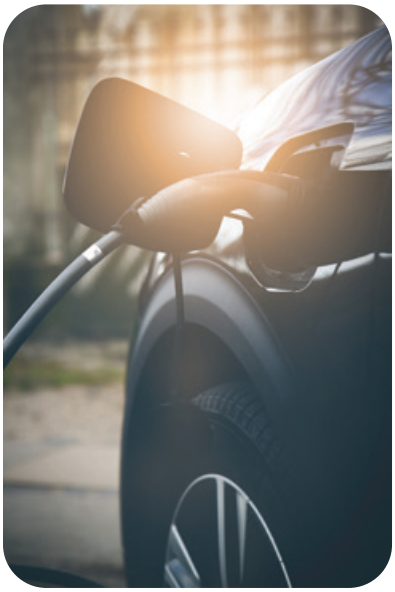

Russia Report

By Maxim Sakov, Market Consultant, Russia Operations

Editor's Note: *PPower Systems Research has paused all research and business development activities in Russia. We have maintained a presence in Russia since 2013 to bring important updates to our clients about the powered equipment markets within Russia. We are monitoring the current situation on a daily basis 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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