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Alternative Power Report

By *Guy Youngs*, Forecast & Adoption Lead



*Guy
Youngs*

Are Sodium Ion Batteries Viable Alternative to Lithium?

Despite lithium ion battery prices continuing to fall, interest in sodium ion (Na-ion) energy storage has not waned. Sodium ion batteries are undergoing a critical period of commercialization as industries from automotive to energy storage bet big on the technology. Sodium ion looks well placed, with superior safety, raw material costs, and environmental credentials.

Sodium ion cells, produced at scale, could be 20% to 30% cheaper than the dominant stationary storage battery technology, lithium ferro/iron-phosphate (LFP), primarily due to abundant sodium and low extraction and purification costs. Sodium ion batteries can use aluminum for the anode current collector instead of copper, which is used in lithium ion batteries, further reducing costs and supply chain risks.

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

PSR Analysis. The potential savings are dependent on scale production, but Sodium Ion batteries suffer from lower energy density and shorter life cycles, and the potential for both of these problems exceeds current lithium ion batteries.

New Hydrogen Colors to Watch and Why They Matter

Hydrogen has the potential to be emissions free but only if we understand how the hydrogen is generated / manufactured or whether it occurs naturally. Several new terms have been used recently in the press, and this article explains them.

Gold hydrogen refers to naturally occurring deposits of the gas trapped underground in a way similar to how natural gas and oil deposits are found under the Earth's surface. This type of H₂ is different from White in that White now typically refers to the gas when it is above the surface, such as in the atmosphere, but Gold refers specifically to the gas found in underground deposits.

Yellow hydrogen refers to the type of H₂ produced using solar energy. Clear Hydrogen is not yet a specific category on the list of hydrogen colors, but it is a term popping up more frequently this year. It is being used by companies looking for a new designation for their clean methods of H₂ production.

Source: *Hydrogen Fuel News* [Read The Article](#)

PSR Analysis. While using colors to denote the way hydrogen is manufactured, I wonder if this is going too far. Green hydrogen is hydrogen produced using renewable energy, so why do we need Yellow as a classification, and using Clear as a definition seems pointless.

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Alternative Power Report

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Study Shows Plug-in Hybrids Aren't as Clean as We Thought

A new report by the European Commission shows that plug-in hybrid electric vehicles create much more emissions than we previously thought – by an average of 3.5 times as much as lab testing indicates.

Plug-in hybrids (PHEVs) were thought to bring the best of both worlds – a large enough battery to take care of your daily tasks, paired with a gas engine for longer trips. There are downsides in cost and complexity, but the powertrain choice does provide more options than others.

For this reason, PHEVs have long been thought of as an ideal transitional technology between gas vehicles and electric ones. People would be able to do most of their driving on electricity and only occasionally use gas. The problem is... that doesn't happen.

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

PSR Analysis. There have been a great number of reports that have echoed this in the past, with little follow-up action. Many traditional automotive manufacturers continue to mass produce these cars, which are often described as very little more than a marketing ploy. However, this report is important because it was produced by a government entity, rather than by NGOs.

CATL, Yutong Launch Long-life EV Battery

CATL has launched a battery pack with Yutong Bus Co to power commercial vehicles like buses and trucks. Yutong said the new battery packs will be used in upcoming electric vehicles and that the new long-lasting EV battery has zero degradation through the first 1,000 cycles.

The new EV battery pack, made with CATL, has a 932,000 mile (1.5 million km), 15-year warranty. Yutong calls the long-life battery an industry first. The bus manufacturer introduced another battery with a 10-year and 621,000 mile (1 million km) lifespan.

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

PSR Analysis. Given that you can get 500k KM batteries today, it makes one wonder why we need 1.5m km batteries and are they just an over-engineered product mixed with marketing hype. Most vehicle don't ever achieve 500,000 km before the vehicle itself begins to deteriorate. **PSR**

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Globally, medium, and heavy commercial vehicle production is expected to decline by 1.5% this year over 2023.

Truck Production Index

By *Jim Downey, Vice President-Global Data Products*

Chris Fisher, Senior Commercial Vehicle Analyst

Q1 2024 Power Systems Research Truck Production Index (PSR-TPI) falls 4.5%

Power Systems Research St. Paul, MN (April 15, 2024)— The Power Systems Research Truck Production Index (PSR-TPI) decreased from 116 to 111, or 4.5%, for the three-month period ending March 31, 2024, from Q4 2023. The year-over-year (Q1 2023 - Q1 2024) PSR-TPI was flat at 111. There was no change.



Truck Production Index



Chris Fisher

The PSR-TPI measures truck production globally and across six regions: North America, China, Europe, South America, Japan & Korea and Emerging Markets.

This data comes from **OE Link™**, the proprietary database maintained by Power Systems Research.



Jim Downey

All Regions. In 2024, Medium and heavy commercial vehicle production in Europe, South Asia and North America is expected to decline modestly while production in China, South America, Japan, and Korea is expected to improve over last year.

Global Index. Globally, medium, and heavy commercial vehicle production is expected to decline by 1.5% this year over 2023. Moving into 2024, much of the focus on demand will be centered around slowing global economic conditions that will impact overall freight demand.

Global Report

By *Michael Aistrup, Senior Analyst*



Michael Aistrup

Global Lawn and Garden Equipment Market

The global lawn and Garden Equipment Market, which includes commercial and residential equipment, is projected by Power Systemes Research to reach sales of \$46.16 billion by 2030. This is a projected increase of \$15.96 billion dollars from 2023 to 2030, an increase of 52.8%.

The global impact of COVID-19 is stating to wane and the market

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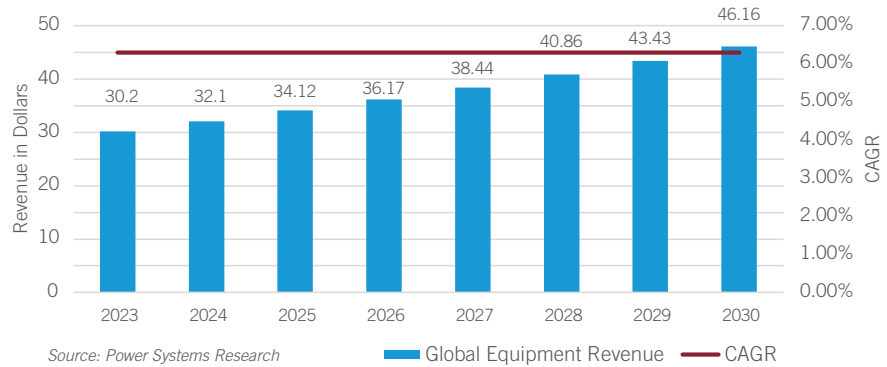
Global Report

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is returning to a normal growth rate. Individual homeowners are still interested in lawn and garden care, just not as much as during COVID-19. More people are returning to recreational activities.

Global Lawn & Garden Equipment Revenue



LAWN & GARDEN MARKET INTELLIGENCE

John Deere has announced an enhanced self-repair solution, available initially in the U.S. through its Equipment Mobile app, enabling customers to remotely download secure software updates directly to embedded controllers on compatible 4G-connected John Deere equipment. Customers can use this enhanced solution to complete secure software updates directly to an embedded controller through a user-friendly interface using the Equipment Mobile app.

Husqvarna is introducing the first battery-powered chainsaws with a clutch. With the power equivalent of a 40cc gas engine, the T542i XP and 542i XP chainsaws can cut up to 10% more when compared to Husqvarna's current professional 40 V battery chainsaw platform without the clutch feature. Equipped with a clutch, the new T542i XP and 542i XP provide the familiar feel of a gas-powered engine, but with less noise and no fumes.

Toro has introduced the eProStripe 560 equipped with two 60V Lithium-Ion batteries. The MatchDrive variable speed electric transmission offers a greater speed range to operators while also allowing fine-tuning to suit conditions and a consistent cut when using multiple units. The system provides three preset speeds, consistent with the mechanical drive on the ProStripe, plus an additional variable speed option.

Briggs & Stratton is launching the Vanguard **Lithium-Ion 48V 1.5kWh Commercial Battery (Si1.5)**. This announcement comes as the company is growing its **Vanguard battery portfolio** to include swappable (**Si Series**) and fixed (**Fi Series**) battery pack configurations to meet a wider range of application and equipment needs. The latest in Vanguard battery technology, the Si1.5 Battery features a self-contained package with a handle on top for easy swapping between equipment on the jobsite. **PSR**

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DATAPOINT: North America Plate Compactors 3,200

By Carol Turner, Senior Analyst, Global Operations

In 2023, production of Plate Compactors in NA decreased 28.4%. Production is expected to remain flat with a slight decrease of 1% in 2024.

3,200 units is the estimate by Power Systems Research of the number of Plate Compactors expected to be produced in North America in 2024.

Plate Compactors, also known as plate vibrators, are used to compact soils, base materials, sand beddings and pavers, to promote interlocking.

One key piece of equipment for almost all jobs is a plate compactor. There are three main categories of plate compactors: a single plate, reversible plate and heavy-duty compactors, mostly used for soil and asphalt compaction. The most popular are reversible plate compactors because they can go in both directions (forward/backward).

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: Up to 30% worldwide.

Market Share: Leading the Plate Compactors market in North America is M-B-W with 52% of total units produced. In second position is Canadian-based Bartell Morrison with 35%; third, is Vibco with 5.5%

Trends. In 2023, production of Plate Compactors in NA decreased 28.4%. Production is expected to remain flat with a slight decrease of 1% in 2024. The decline is mostly due to Exmark (Toro) discontinuing their line of forward plate compactors along with other company models being discontinued. The market hasn't recovered from 2020 Covid-19 related factors. Even though there is a desire for new equipment, the constantly fluctuating construction market hinders demand.

Expect the production of Plate Compactors in NA to increase up to 10% by 2030.

Electrification of this segment has continued at a modest pace in recent years. The leading companies in electric products are Packer and Vibco.

Battery/Corded Combined			Corded only:		
2022	25		2022	24	
2023	26	4% increase	2023	27	12.5% increase
2024	32	23% increase	2024	30	11% increase

Battery only:		
2022	1	
2023	1	Remained flat no change
2024	2	100% increase 1 to 2 units

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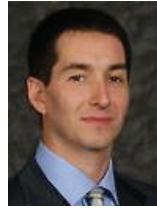
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Europe Report

A New Path for Van Hool



*Emiliano
Marzoli*

By Emiliano Marzoli, Manager-European Operations

Brussels, Belgium – After weeks of uncertainty and, finally, a bankruptcy, bus and trailer manufacturer Van Hool can look to the future again. The company trustee has accepted the bid from the competitor VDL - Schmitz-Cargobull. This move was seen by the trustee as the quickest and most efficient way to restart the operations without losing additional company value, and important resources.

Just before the deal was signed, Guido Dumarey and ABC Companies, the Van Hool distributor for the USA, also launched their bid, but the trustee believed that it would have required too much time to restart the bid process, causing valuable human resources to leave Van Hool. However, not all jobs will be maintained, and most probably 1,500 employees will be cut from the company.

Source: *Sustainable Bus* [Read The Article](#)

PSR Analysis: With this move, VDL group will be able to increase their market share in Europe and establish a strong position in the US, where Van Hool was highly recognised. VDL announced it will maintain and expand Van Hool operations in Belgium. With this acquisition, VDL group will be looking to produce close to 2,000 buses per year in the coming years, according to our database CV Link™. A wider technological mix, including Fuel Cell busses, and the access to the US market will accelerate VDL growth. **PSR**

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*Fabio
Ferraresi*

Brazil/South America Report

By Fabio Ferraresi, Director Business Development South America

John Deere Announces New Investments in Brazil

John Deere, has announced the acquisition of the condominium housing the company's regional office in Indaiatuba (SP) and the Parts Distribution Center for South America (SA-PDC) in Campinas (SP), along with adjacent land for future expansion. The company also recently has acquired two plots in the Montenegro Industrial District (RS). These investments are part of the company's ongoing commitment to development and expansion in the national market.

The South America Parts Distribution Center (SA-PDC), inaugurated in 2008,

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South America Report

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operated in a leased space. The purchase included an area of 125.5 000 m², the current installation of 76.2 000 m², and land of 198.3 000 m² nearby. In addition to the distribution center operation, the complex includes a building housing the Training Center (CT) and the Precision Agriculture and Innovation Center (CAPI), which will soon be relocated to the Brazilian Technology Development Center, announced in November 2023 by the company.

Investments in Montenegro (RS). In the Montenegro Industrial District (RS), John Deere acquired two plots adjacent to the factory. The purchase was conducted through the Industrial District Implementation Program (PROEDI/RS), as part of a total amount of US\$ 53 million to be invested by 2026 in new production lines for component localization, expansion of storage areas, a warehouse and restaurant, as well as expansion of internal areas.

Brazilian Technology Development Center. Recently, the company announced the construction of the Brazilian Technology Development Center in Indaiatuba (SP), scheduled to open by the end of 2024. This will be the world's first development and testing center for tropical agriculture, and the company is investing approximately US\$ 35 million in the project.

The unit will design and test products to be used in Brazilian territory, considering variables such as soil, climate, connectivity levels, etc. In addition, John Deere expects to reduce the development time of new solutions by up to 40%, depending on the type of project, ensuring that local customers have access to products and solutions more quickly.

Expansion in Brazil. In the country, the company's units produce equipment that reaches nearly 55 countries. And its Dealership and Distributor Network ensures coverage throughout the national territory with more than 300 sales points and a wide base of suppliers.

The company also has acquired these companies: Auteq Telematics, a software and onboard computer company; PLA, a sprayer manufacturer; Unimil, specialized in parts and after-sales services for sugar cane harvesters; and Ciber, a member of the Wirtgen Group, a world leader in pavement solutions; in addition to the acquisition of excavator factories through the joint venture with the Japanese company Hitachi in 2021

Source: [Press Release](#) [Read The Article](#)

PSR Analysis. The investments in Brazil on technology development, production and distribution affirms the belief of John Deere in the bright future of Brazilian and South American Agriculture, which have reached record harvests in Argentina in 2024 and every other year in Brazil when the weather doesn't break the harvest. Moreover, exports from Brazil to other countries are expected to keep growing and gaining in importance, given the scale and competitiveness in the country.

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South America Report

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Volvo has received authorization from the Ministry of Transportation to begin testing its heavy electric trucks in Brazil.

Volvo To Begin Testing Heavy EV Trucks

Volvo has received authorization from the Ministry of Transportation to begin testing its heavy electric trucks in Brazil. The vehicles will be part of a study and will be able to operate in urban areas, metropolitan regions, and short to medium-distance intercity transportation, aiming to evaluate their performance and impact on pavement in this type of operation.

The transport companies ReiterLog and Ritmo Logística will be the first to operate the Volvo electric trucks. Preliminary results from the study, led by Senatran (National Traffic Department), with technical coordination from Inprotran (National Institute of Traffic and Safety Projects), in partnership with Volvo, Prometeon, UNB, and UFRGS, indicate benefits of operating zero-emission CO2 vehicles, such as high energy efficiency, absence of noise, low vibration levels, and increased driver comfort.

At the end of the tests, the goal will be to establish axle weight regulations that allow heavy vehicles to transit safely and efficiently.

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

PSR Analysis. Electric propulsion for heavy tractor and the legislation for axle maximum weight are not compatible. This study is important to prepare the legislation for alternative propulsion technologies and enable the ultimate objectives of cleaner transportation. **PSR**

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Far East: Japan Report

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



*Akihiro
Komuro*

Kubota Unveils First Fuel Cell Tractor

On March 28, Kubota unveiled the first prototype of a fuel cell-powered tractor. Although no release date has been set, the company will consider installing fuel cells in unmanned, automated tractors. Kubota is also developing battery-powered agricultural equipment, but the company believes that hydrogen-powered fuel cells will be effective for medium-large sized agricultural equipment.

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Far East Report

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Kubota is rushing to commercialize fuel cells because it believes demand will grow in developed countries such as Japan, Europe and the United States as a result of the trend toward decarbonization. The prototype machine has about 60 horsepower and has three hydrogen tanks installed above the cabin, which are used in Toyota's Mirai fuel cell car. It generates electricity by reacting hydrogen with oxygen to power the engine. In the experiment, a tractor was equipped with a plowing unit to till the soil.

Compared to passenger cars, agricultural equipment requires longer operating hours and more power for certain tasks. Kubota expects that small and medium-sized agricultural equipment can be powered by rechargeable batteries, but for large and medium-sized agricultural equipment, the batteries may become too heavy, so fuel cells may be more effective. The company will promote the decarbonization of agricultural equipment through an "all-round strategy," including the use of hydrogen engines.

A demonstration was also conducted in which hydrogen was filled into a tank on the top of the tractor; the tank can be filled with about 7.8 kilograms of hydrogen in 10 minutes, allowing the tractor to run for about four hours.

The prototype machine is about one-third as loud as conventional diesel-powered machines. In addition to being able to work at night, the machine also produces less vibration in the cab, which is expected to help reduce the burden on farmers.


Source: The Nikkei

PSR Analysis: The development of fuel cell powered equipment is being promoted by leading OEMs in each segment of industry. In the agricultural equipment segment, Kubota was one of the first OEMs to actively pursue the development of fuel cell-powered machinery. Kubota is a member of the Hydrogen Value Chain Promotion Council, an organization that aims to promote hydrogen in Japan. It's one of the 25 board members that include Toyota, Kawasaki Heavy Industries, Kobe Steel, and Toshiba.

From a practical standpoint, there are many challenges to the widespread use of hydrogen and fuel cells. Even if equipment is equipped with fuel cells, if CO₂ is generated in the process of producing hydrogen, the actual CO₂ reduction effect will be limited. Diesel engines are still the mainstay of agricultural equipment, and it is essential to establish a supply chain that is as easy to obtain as that for diesel oil. It would be unreasonable to ask farmers to bear a greater burden of fuel costs.

Given the difficulties in solving these problems, it could take several decades before fuel cells are fully accepted in the marketplace. It is not certain that the current development of fuel cells will be recognized as an extremely worthwhile investment in the future--we will have to wait and see. **PSR**

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Far East Report

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クボタ、燃料電池トラクター初公開 自動運転化も検討

クボタは3月28日、燃料電池を動力源とするトラクターの試作機を初めて公開した。発売時期は未定だが、無人の自動運転トラクターに燃料電池を搭載することも検討する。クボタはバッテリー充電式の農機も開発しているが、中・大型の農機では水素を使う燃料電池が有効だとみている。脱炭素の流れで日本や欧米など先進国で需要が生まれるとみて、実用化を急ぐ。試作機は60馬力ほどで、キャビン上部にトヨタ自動車の燃料電池車「ミライ」に使われる水素タンクを3本設置した。水素と酸素を反応させて発電し、モーターに電力を供給する。実験ではトラクターに耕運用の作業ユニットを装着して土を耕した。

農機は乗用車に比べ稼働時間が長く、作業によっては大きなパワーが必要だ。クボタは中・小型の農機ではバッテリー充電式でエネルギーを確保できるとみているが、中・大型の農機ではバッテリーが重くなりすぎる可能性があるため、燃料電池が有効だとみる。水素エンジンの活用も含め、「全方位戦略」で農機の脱炭素化を進める。

トラクター上部のタンクに水素を充填するデモも実施した。10分間で約7.8キログラムの水素を充填することで、4時間程度の走行が可能になるという。試作機はディーゼルエンジンで動く従来式に比べ、騒音を約3分の1に抑えられる。夜間でも作業できるほか、運転室の振動も少なく、農家の負担軽減につながるとみている。

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: 燃料電池駆動の機械開発は、各業界のリーディングOEMによって進められている。農業機械セグメントにおいてはクボタがいち早く積極的に取り組んでいる。クボタは日本での水素普及を目指す団体「水素バリューチェーン推進協議会」に、トヨタや川崎重工業、神戸製鋼や東芝が名を連ねる25社の理事会員の1社として参画している。

現実的に考えると水素、燃料電池の本格的な普及には課題が多い。機器側が燃料電池を搭載しても、水素を生み出す過程でCO2が発生してしまうのでは実際にCO2削減効果は限られたものになってしまう。現状農機ではディーゼルエンジンがまだまだ主流であり、軽油と同等の調達のしやすさなども当然求められるため、サプライチェーンの構築も不可欠だ。コストもこれ以上の燃料負担を農家に求めるのは酷な話だろう。

こうした課題解決の困難さを考慮すると、燃料電池の本格的な普及にはまだ数十年単位の長い時間を要するだろう。だが、そのための先行投資として、現在行われている開発が後々に極めて有意義なものだと評価されるかどうかは、歴史の回答を待つほかにはない。PSR

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It has been reported that this investment will also be used to accelerate the development and production of two Volkswagen brand smart electric vehicle models co-developed with Xiaopeng Motors.

China Report

By *Jack Hao*, Senior Research Manager - China



*Jack
Hao*

VW To Inject € 2.5 billion into Hefei Base

Facing intense competition in China's new energy vehicle market, Volkswagen has decided to increase investment in its Hefei base. On April 11, Volkswagen announced an additional investment of €2.5 billion in its production and innovation center in Hefei to further strengthen its local R&D capabilities.

It has been reported that this investment will also be used to accelerate the development and production of two Volkswagen brand smart electric vehicle models co-developed with Xiaopeng Motors. Volkswagen revealed that the first model, a mid-size SUV, is planned to enter production in 2026.

The Chinese automotive market is rapidly moving towards an era of fully interconnected electric mobility, and as the multinational automaker with the largest market share in China, Volkswagen is pushing to keep this position.

Currently, the Volkswagen Hefei base, centered around the joint venture vehicle manufacturing enterprise Volkswagen Anhui, has become Volkswagen's smart connected electric vehicle hub in China and a focal point of Volkswagen's investments in the country. In May 2023, Harjo Kern, CFO of Volkswagen Anhui, stated that Volkswagen's total investment in the Hefei base amounted to US\$ 3.19 billion (23.1 billion RMB), with the first phase of production base and R&D center fixed asset investment totaling US\$ 1.95 billion (14.1 billion RMB); pre-model launch R&D total investment was about US\$ 1.25 billion (9.05 billion RMB).

After three years of construction, the Volkswagen Hefei base currently has five parts: Volkswagen Technology (China) Co., Ltd., Volkswagen Anhui, Volkswagen Digital Sales Company, Volkswagen Anhui Parts Company, and software development company, Cariad China.

Among these, the Volkswagen Technology Company, established in April 2023 with an investment of 1 billion euros by Volkswagen, is the largest R&D center outside of Volkswagen's German headquarters. The main task of this R&D center is to develop customized models for the Chinese market, with its first goal being to reduce the development cycle of new products by 30% and costs by 30%, to compete on equal footing with local Chinese automakers in terms of speed.

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

PSR Analysis. China is one of the largest automotive markets globally, with a vast consumer base and significant growth potential. China's position as the world's largest market for new energy vehicles presents an irresistible allure for multinational automakers. This enormous market size offers vast sales potential and growth opportunities for these companies.

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China Report

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The Chinese government has been promoting further market opening and providing favorable policy support for foreign enterprises. China continues to optimize its business environment, offering solid guarantees and support to attract foreign investment. Additionally, the Chinese government has shown strong support for the new energy vehicle industry, including subsidy policies and infrastructure development, creating a favorable environment for multinational automakers.

As the automotive industry transitions towards electrification, intelligence, and connectivity, China has demonstrated formidable technological strength and innovation capabilities in these areas. Through cooperation with Chinese companies and research institutions, multinational automakers have boosted local R&D and technological collaboration, driving the development and application of new technologies.

With a complete automotive industry chain and supply chain system, China can provide efficient, low-cost production and ancillary services for multinational automakers. Foreign automakers bring high-quality products and service standards to the Chinese market, along with advanced production philosophies and talent cultivation mechanisms, which help elevate the overall level of China's automotive industry.

This collaboration demonstrates Volkswagen's determination to achieve its set goals in China and also reveals the increasing competitive pressure it faces. If Volkswagen were to develop independently, the launch time would be delayed. Although the ID series of electric vehicles has made some progress in the domestic market, there is still a gap in software intelligence compared to mainstream new energy products.

The joint development between Volkswagen and Xiaopeng Motors leverages each other's strengths to quickly launch products and seize the market. Xiaopeng Motors will provide the vehicle platform, smart cockpit, and intelligent driving systems, while Volkswagen will contribute its globally leading engineering and supply chain capabilities.

The advantage of this collaboration is the faster development of new vehicles. Moreover, Volkswagen and Xiaopeng Motors have established a joint procurement plan for common components and platforms, which will help reduce costs and enhance product competitiveness. **PSR**

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India Report

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



*Aditya
Kondejkar*

“India is a key market for vehicle electrification, particularly due to the government’s carbon neutrality goals, which makes securing cost competitiveness through localized battery production crucial,” Heui Won Yang, president and head of Hyundai Motor and Kia’s research and development division.”

Source: *Business Standard*. [Read The Article](#)

The electric vehicle (EV) market in India is experiencing significant developments, with both domestic and multinational automotive players vying for a share of the burgeoning market. In this article, we analyze the strategies of two major automotive conglomerates, Hyundai-Kia and Stellantis, as they embark on their EV initiatives in India. By examining their approaches to localization, market expansion, and competitive positioning, we provide insights into the evolving landscape of EV adoption in the country.

Hyundai-Kia's Localization Strategy: Hyundai Motor Company and Kia Corporation's partnership with Exide Energy Solutions represents a strategic move towards localizing EV battery production in India. By focusing on lithium iron phosphate (LFP) cells, Hyundai-Kia plans to capitalize on India's growing EV market while aligning with the government's carbon neutrality goals. This localization strategy enhances cost competitiveness and also positions Hyundai-Kia as pioneers in integrating domestically produced batteries into their EV models.

The Memorandum of Understanding (MOU) with Exide Energy Solutions underscores Hyundai-Kia's commitment to expanding its exclusive battery development, production, and supply chain partnerships in India. By leveraging local expertise and resources, Hyundai-Kia seeks to strengthen its foothold in the Indian EV market and gain a competitive advantage over rivals.

Stellantis' Export-Oriented Approach: In contrast, Stellantis is adopting an export-oriented approach to leverage India's cost competitiveness in manufacturing and expand its presence in Southeast Asian markets. The export of Made in India 'E-C3' electric cars to Indonesia marks a significant milestone for Stellantis as the first multinational OEM in India to export EVs internationally.

By tapping into India's skilled workforce and manufacturing capabilities, Stellantis aims to position the country as a 'best cost country' for its global operations. The company's focus on exports reflects its strategic intent to capitalize on India's manufacturing prowess while simultaneously catering to the growing demand for EVs in neighboring markets such as Nepal and Bhutan.

Comparative Analysis: Hyundai-Kia's localization strategy aligns with its long-term commitment to sustainable mobility and technological innovation. By investing in

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The strategies adopted by Hyundai-Kia and Stellantis in the Indian EV market reflect their respective priorities, capabilities, and competitive positioning.

local battery production, Hyundai-Kia aims to establish a competitive advantage in the Indian EV market while contributing to the country's economic and environmental goals.

On the other hand, Stellantis' export-oriented approach reflects its pragmatic focus on leveraging India's cost competitiveness to enhance global competitiveness. By exporting "Made in India" EVs to Southeast Asian markets, Stellantis seeks to capitalize on India's manufacturing capabilities while expanding its international footprint.

Conclusion: The strategies adopted by Hyundai-Kia and Stellantis in the Indian EV market reflect their respective priorities, capabilities, and competitive positioning. While Hyundai-Kia emphasizes localization to gain a competitive edge in the domestic market, Stellantis prioritizes exports to capitalize on India's manufacturing advantages and tap into international demand. As the EV landscape continues to evolve, both companies are poised to play significant roles in shaping the future of mobility in India and beyond. **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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