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In This Issue

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Alternative Power Report

By Guy Youngs, Forecast & Adoption Lead

Guy Youngs

VW Employment "Earthquake" Hits Germany

Volkswagen Group has let it be known that it might need to shutter two factories in Germany. It also indicated it might need to end the "guaranteed employment" policy it has adhered to for decades that is designed to ensure workers there will always be a job for them within the Volkswagen family. The news has rocked the company and has been described as an earthquake by some in the German media

Layoffs, which are common in the industry, are not the Volkswagen way, but now it appears that this promise is in danger as the company struggles to adapt to the current market situation

Source: *CleanTechnica* **Read The Article**

PSR Analysis: There is much criticism of VW's failure to grasp the opportunities presented by the electric and hybrid car markets. There is also a lot of criticism about those EV models that VW does build. This coupled with the fact that every fifth electric vehicle sold in Europe today is produced in China, means that the German auto industry is now in crisis and what it does next may determine if it survives. **PSR**

Europeans Unveil Solid-state Battery with 1,070 Wh/L Energy Density

A European research consortium has produced a prototype solid-state battery using a new manufacturing process that reportedly achieves high energy densities and can be implemented on modern lithium-ion battery production lines

The "SOLiDIFY" consortium, composed of 14 European research institutes and partners, developed a battery with a pouch cell with an energy density of 1,070 Wh/L, compared to 800 Wh/L in standard lithium-ion batteries

The group estimates the cost of the batteries at €150 ($166)/kWh, compared to Bloomberg Nef's current estimates of €67/kWh for lithium iron phosphate batteries and €93/kWh for high-nickel NMC batteries

Source: *PV Magazine* **Read The Article**

PSR Analysis: We see many innovations in battery technology which show a lot of promise – this one gives a 20% improvement in density and thus is said to provide increases in range or reductions in battery size/weight. The cost implications are a concern, but a lot of other solid state batteries are promising more significant results. **PSR**

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Alternative Power Report

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Your EV May Fall Apart Before Its Battery Pack Does

Geotab, an automotive telematics company, is using its in-depth access to EV data to track battery health. And its new study of 10,000 electric cars shows that their battery packs could outlast the vehicles themselves

With five years of data, the company recently released a new study that shows the average degradation per year is actually 1.8%. The company believes that it could translate to EV batteries lasting 20 years.

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

PSR Analysis: When EVs first appeared, there was a lot of talk about needing to replace the batteries after five years. That soon became 10, 15 and now 20 years, and so proving many ICE doubter wrong. Battery replacement need not be a concern when buying an EV. **PSR**

Hydrogen Fuel Technology May Be Falling Behind

Ballard Power Systems, a large hydrogen fuel cell making company from Canada, has announced a massive overhaul that will slash its spending by 30%, including huge job cuts

According to Ballard CEO Randy MacEwen, there has been a notable slowing in both the development of clean hydrogen fuel production capacity, and the infrastructure used for the distribution of H2

Source: *Hydrogen Fuel News* **Read The Article**

PSR Analysis: Ballard has long been one of the leading Fuel Cell companies globally and the action of cutting costs by 30% and putting its entire China strategy at risk, will echo throughout the fuel cell industry. This is yet another body blow to this industry. **PSR**

Truck Production Index

Q3 2024 Truck Production Index Falls 8.9%

By Jim Downey, Vice President-Global Data Products
Chris Fisher, Senior Commercial Vehicle Analyst

Power Systems Research TPI *Truck Production Index*

Download the entire Q3 2024 Truck Production Index Report here.

St. Paul, MN (July 19, 2024)— The Power Systems Research Truck Production Index (PSR-TPI) decreased from 123 to 112, or-8.9%, for the three-month period ending Sept. 30, 2024, from

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Truck Production Index

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Globally, medium and heavy commercial vehicle production is expected to decline by 1.4% this year over 2023.

Chris Fisher

Jim Downey

the Q2 2024. The year-over-year (Q3 2023 to Q3 2024) decrease for the PSR-TPI was, 114 to 112, or -1.8%.

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.

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

Global Index. Globally, medium and heavy commercial vehicle production is expected to decline by 1.4% this year over 2023. Moving into 2025, much of the focus on demand will be centered around slowing global economic conditions that will likely impact overall freight demand. **PSR**

DATAPOINT: *North America Cranes*

1,500

By Carol Turner, Senior Analyst, Global Operations

1,500 units is the estimate by Power Systems Research of the number of Cranes expected to be produced in North America in 2024.

The Chassis is the underpart of the crane and consists of the frame on which the body is mounted. The upper crane unit, which has its own engine, goes on top of the crane chassis. Cranes with two engines, one for the chassis and one for the upper unit/part make up this configuration. The chassis drives the crane and makes it move forward and backward.

Upper Crane Units This is the part of the crane which sits on top of the crane chassis. Upper crane units have their own engines. Cranes with two engines, one for the chassis and one for the upper unit/part, make up this configuration. The upper unit operates and powers the lifting and loading capability of the crane.

Pedestal Cranes. This equipment is used on projects that are stationary or where mobility needs are small; they offer the perfect combination of powerful performance, durability and cost effectiveness.

Self-Propelled Cranes This is a mobile crane which is a self-propelled vehicle, one that is designed for lifting objects using a boom with lifting gear. It only carries

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DataPoint

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loads that are necessary for its own propulsion or equipment.

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.

Market Share: Dominating production of cranes in NA is Manitowoc Cranes with 61.5%. In second position with 21% is Broderson; third, Link-Belt with 17.5%.

Export: Up to 25% worldwide.

Trends. In 2023, production of cranes in North America decreased 6% from 2023. Production is expected to increase 5% in 2024 over 2023. This segment was flat for several years prior to 2020 because of COVID-19 related factors. With the economic recovery, construction is resuming and contractors are taking on new projects that require new cranes to replace older, outdated machinery. Increased infrastructure activity and high-rise construction are two of the major contributors cited for improving crane demand. Expect crane production to gain up to 5% by 2030 as demand for new products rises. This specific market has seen improvement, but it is not a recovery compared to high volumes during the peak in 2008.

Battery powered units
Broderson Mfg. Corp:

2022: -0-
2023: 2
2024: 4
PSR

Show Report

Electric Boats Highlight 2024 Cannes Yacht Festival

Natasa Mulahalilovic

By Natasa Mulahalilovic, Marine Product Manager-Europe

Download the entire report here.

More than 600 exhibitors from the marine pleasure industry showed off their latest models of boats, yachts, marine equipment and other products and services at the 47th annual Cannes Yachting Festival, Europe's biggest in-water event, just closed its doors. The event ran Sept. 10-15.

An estimated 50,000 visitors attended the festival and got an excellent note for organization from all participants and visitors. The next year's edition will be held Sept. 9-14, 2025.

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Show Report
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The electric marine market has been very dynamic in the last 10 years and electric products and accessories were very popular at the show. Investments in research and development of new technologies and their implementation into boats have been extremely high. **PSR**

Brazil/South America Report

By Fabio Ferraresi, Director Business Development South America

Brazil Set To Start First Natural Gas Truck Corridor

Fabio Ferraresi

Eneva, a natural gas operator, plans to supply liquefied natural gas (LNG) for Virtu LNG's truck fleet, starting in January 2025. This fuel will be used for the logistics and distribution operations of Yara Brasil, a global leader in plant nutrition.

The initiative will begin in Maranhão and is expected to expand to other states. The transportation contract was signed on September 24 at the ROG-e fair, a major oil and gas event.

Yara will transport 50,000 tons of fertilizers per year using LNG-powered trucks provided by Eneva. This will reduce greenhouse gas emissions by 20% and cut NOx and SOx emissions by 90%.

Source: *Grandes Construções / Exame* **Read the Article**

PSR Analysis: Reduction of GHG, NOx and SOx is possible with the elimination of infrastructure bottlenecks to allow the penetration of Natural Gas Trucks in Brazil. Private initiative is doing by itself while the government tries to meet all stakeholder requests but does not move with Heavy Transportation decarbonization. All in all, the movement is in line with our forecasts of NG penetration increase for next several years.

Randon Delivers First Semi-Trailer with Electric Drive System

Randon showcased its innovations at two major global mobility fairs. At the IANA Intermodal Expo in the U.S., it celebrated delivering its first container chassis semi-trailer with the e-Sys system to the North American market. This sale was made through its subsidiary, Hercules Chassis, to South Carolina Port Authorities. Randon also participated in the IAA Transportation fair in Germany, where it focused on expanding exports from its U.S. subsidiary, especially targeting the African market.

Source: *Press Release* **Read The Article**

PSR Analysis: This announcement opens doors for Randon to increase its market penetration in the U.S. and possibly expand into neighboring markets such as

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South America Report

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NYK has announced the completion of an ammonia-fueled tugboat, which was produced through research and development in cooperation with IHI and ClassNK.

Canada and Mexico. Success with this technology in one of the largest global markets can also enhance Randon's brand recognition, credibility, and export potential, especially in regions that prioritize advanced and sustainable logistics solutions. **PSR**

Far East: Japan Report

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

Akihiro Komuro

Ammonia-fueled Tugboat Completed

NYK has announced the completion of an ammonia-fueled tugboat, which was produced through research and development in cooperation with IHI and ClassNK. This is the wworld's first ammonia-fueled vessel designed for commercial use. It will be used for commercial operations in Tokyo Bay during a three-month demonstration voyage.

Source: New Energy News

PSR Analysis: Tugboats, which are also used to tow large ships, are equipped with high power engines. The completion of such a commercial vessel equipped with a high power engine is significant in that it expands the options for the practical application of ammonia fuel technology in the commercial marine sector.

Ammonia is attracting attention in the shipping industry as decarbonized fuel, and research and development continues to progress. However, since hydrogen, the raw material for ammonia, is often derived from fossil fuels such as natural gas, CO2 is often generated in the production process of Ammonia. The challenge now is to improve the availability of ammonia fuel, including the development of a supply chain, and to reduce CO2 emissions during production. **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

アンモニア燃料タグボートが竣工

日本郵船は、IHI原動機とともに日本海事協会（ClassNK）の協力を得て研究開発を行っていたアンモニア燃料タグボートが竣工したと発表した。商用利用を前提としたアンモニア燃料船は世界初だ。今後は東京湾でのえい船業務を行いながら、3カ月の実証航海を行う予定だ。

参考: 新エネルギー新聞（一部筆者により元記事内容を改編しました）

PSR 分析: 大型船舶の曳航にも従事するタグボートは、例えば260トンクラス船では4000馬力超のエンジンを搭載する。こうした商用・大馬力エンジン搭載船が竣工したことは、商船分野におけるアンモニア燃料技術の実用化の選択肢を広げるという点で大きな意味を持つ。

アンモニアは炭素を含まないことから海運業界では脱炭素燃料として注目され、研究開発が進められている。

アンモニアの原料となる水素は天然ガスなど化石燃料由来のものを多く含んでいるため、製造過程でCO2が発生するケースが多い。そうした製造時におけるCO2排出量とアンモニア燃料のサプライチェーンの構築も含めた調達性の向上が今後の課題となるだろう。**PSR**

Southeast Asia Report

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

AEC Discusses New Goals as Markets Integrate

The Association of Southeast Asian Nations (ASEAN) has outlined the framework for a new implementation plan for the ASEAN Economic Community (AEC), which is attempting to integrate the regional market. The plan will focus on digitalization and decarbonization of the economy as key objectives to be achieved by 2026-30. It will accelerate the integration of the market of 700 million people.

According to the draft plan, it will be structured around six goals, including creating an environment that encourages technological innovation, attracting investment in the green economy and building a food security system. It will include more than 200 specific implementation plans. The plan will be discussed at the ASEAN summit, which began in Laos on Oct. 9, 2024.

The plan includes creating a renewable energy supply network that spans member countries, making it easier for companies to provide financial services, such as

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Southeast Asia Report

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Southeast Asia, where market sizes and levels of development vary from country to country, has sought to develop its relationship with the major powers of Europe and the United States by uniting the countries of the region.

fintech, across multiple countries in the region. In addition to digitizing trade transactions to facilitate trade, discussions are underway to include cooperation in the development of EV supply networks and infrastructure.

Laos has begun exporting hydropower to Singapore, and there are plans to export wind power to Vietnam. The new targets will leverage existing infrastructure to expand decarbonization businesses in the region.

It will also support the creation of a cross-border settlement system. It will expand the area where payments can be made using a common QR code in the region. In 2022, Singapore, Indonesia, Thailand, Malaysia and the Philippines agreed to integrate QR payments. Connections between Malaysia and Cambodia were also launched in mid-September.

The AEC was established in 2015. Unlike Europe's economic integration, which began among the rich, developed countries of Western Europe, ASEAN, which has a wide range of differences in the size of its member countries' economies and levels of development, has a history of gradually promoting integration through measures such as tariff reductions.

The next goal will be to address issues such as the liberalization of the movement of skilled labor, with the aim of creating a single market. The period will be shortened to five years and the integration of the single market will be accelerated.

Source: The Nikkei

PSR Analysis: Southeast Asia, where market sizes and levels of development vary from country to country, has sought to develop its relationship with the major powers of Europe and the United States by uniting the countries of the region. Despite the stagnation caused by the COVID-19 pandemic, the region has continued to achieve stable economic growth of about 5% since 2015.

In addition to boosting intra-Southeast Asian trade, the region is attracting investment from Europe and the United States, and economies of scale are likely to emerge as market integration progresses.

One concern is the relative political instability in the region, as evidenced by the recent coup in Myanmar, and the rise of protectionist sentiment. In addition, China's economic influence is growing, and if this trend continues, the distance between Southeast Asia and Europe and the United States is likely to increase. **PSR**

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東南アジア > 東南アジア全体レポート:

小室 明大 – 極東及び東南アジア リサーチアナリスト

AEC、脱炭素供給網や越境決済促進　市場統合で新目標

東南アジア諸国連合（ASEAN）は域内市場の統合を目指すASEAN経済共同体（AEC）の新たな実施計画の骨格をまとめた。経済のデジタル化や脱炭素化を2026～30年までの目標の柱に据える。7億人市場の統合を加速させる。

草案によると、新計画は技術革新を促す環境の整備やグリーン経済への投資誘致、食料安全保障体制の構築など6つの目標を軸に構成される。200以上の具体的な実施計画を設定する。9日からラオスで始まったASEAN首脳会議などで議論する。

加盟国間にまたがる再生エネルギー供給網をつくることや、企業が域内の複数国にまたがってフィンテックなどの金融サービスを提供しやすくすることなどを念頭に置いている。貿易のやり取りをデジタル化して取引を円滑にするほか、EVの供給網やインフラ整備に向けた協力も盛り込む方向で議論している。

ラオスがシンガポールに水力発電による電力の輸出を始めたほか、ベトナムに風力発電の電力を輸出する計画がある。新目標では既存インフラも活用し、域内の脱炭素ビジネスを拡大する。

国境を越えた決済システムづくりも後押しする。域内で共通のQRコードで支払いができる地域を広げる。2022年にシンガポール、インドネシア、タイ、マレーシア、フィリピンがQR決済の統合で合意した。9月中旬にはマレーシアとカンボジアでの接続も始まった。

AECは2015年末に発足した。豊かな西欧先進国同士で始まった欧州の経済統合とは異なり、加盟国の経済規模や発展度合いに大きな差があるASEANでは関税引き下げなどから段階的に統合を進めてきた経緯がある。

次の目標では単一市場実現に向け、熟練労働者の移動の自由化などの課題にも取り組む。期間を5年間に絞り、域内市場の統合を加速させる。

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: 国によって市場規模や発展の度合いが異なる東南アジアは、域内各国が団結することで、欧米の大国との関係を発展させようとしてきた。COVID-19による停滞はあったものの、2015年以降は概ね5%程度の安定的な経済成長を継続してきた。

東南アジア域内貿易の活性化だけではなく、欧米からの投資先としても、市場統合が進むことでスケールメリットが出てくるだろう。

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懸念事項としてはミャンマーにおけるクーデターのように域内の政治が比較的不安定であることと、保護主義的な考え方にある。また、中国の経済的な影響が強まっており、この傾向が今後も継続するようなら、欧米との距離感が強まるだろう。**PSR**

Several European diplomats told Agence France-Presse that despite strong opposition led by Germany, the EU still approved the imposition of high tariffs on Chinese electric vehicles.

China Report

By Jack Hao, Senior Research Manager - China

Jack Hao

EU OKs Tariff Hike on Chinese EVs

The European Union has approved a tariff increase on Chinese electric vehicles, according to the report from Agence France-Presse. Politicians and industry representatives from several European countries had previously expressed opposition to the European Commission's investigation, and China also condemned the EU's move to impose additional tariffs on Chinese electric vehicles as a typical act of protectionism.

Several European diplomats told Agence France-Presse that despite strong opposition led by Germany, the EU still approved the imposition of high tariffs on Chinese electric vehicles. According to the report, 10 countries, including France and Italy, supported the imposition of a tariff of up to 35.3% on top of the existing 10% tariff. Five countries, including Germany and Hungary, voted against, and another 12 countries abstained.

According to EU decision-making procedures, if 15 member states (accounting for 65% of the EU's population) vote against, the plan to impose additional tariffs would be shelved. Otherwise, the EU will impose additional tariffs ranging from 7.8% to 35.3% on top of the standard 10% import tariff for cars imported from China.

Source: *Huanqiu* **Read The Article**

PSR Analysis: The current automobile import tariff in Europe is 10%, which means that Chinese electric vehicle manufacturers entering the European market could face a maximum tariff of up to 45.3%.

Although Europe has actively embraced the clean energy automotive industry, its electric transformation has been relatively slow compared to that of China. Under such circumstances, some EU member states hope that tariffs will protect the European electric vehicle industry, slowing the external impact; at the same time, they hope that Chinese car companies will bring some cutting-edge technologies and the electric vehicle industry chain to Europe, promoting the electric transformation of European cars, just like the effect caused by Tesla coming to China.

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China Report

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Although imposing tariffs will reduce the price advantage of Chinese car companies, part of the tariff will be passed on to consumers, harming the interests of European consumers.

Moreover, imposing tariffs will also restrict the supply of electric vehicles to European consumers, thus delaying the low-carbon development process of the European transportation industry. and at the same time.

At the same time, this move will weaken the competitiveness of the industry in the long run for companies like Mercedes-Benz Group and BMW Group. Free trade and fair competition can bring prosperity, growth, and innovation to all parties. However, increasing tariffs may harm businesses that are actively operating globally, such as those exporting high-end models to the Chinese market. Large-displacement luxury cars especially may be impacted in this trade conflict. **PSR**

India Report

By Aditya Kondejkar, Research Analyst – South Asia Operations

Electric Tractors: The Future of Sustainable Agriculture

Aditya Kondejkar

As India continues to embrace electrification across many sectors, agriculture stands as one of the next frontiers for transformation. Despite substantial progress in electric vehicles (EVs) for urban mobility, the Agricultural sector, particularly off-road machinery like tractors, remains largely unaddressed. Yet, with emerging technological innovations and government support, electric tractors are poised to revolutionize Indian farming.

Government Initiatives and the Current Landscape. India's government has taken significant steps to encourage electrification in multiple sectors. Initiatives such as FAME I & II, the Production-Linked Incentive (PLI) scheme, and the Electric Mobility Promotion Scheme (EMPS) have propelled the EV market forward. By the end of FY2024, cumulative EV sales reached over 4.1 million units, primarily dominated by two-wheelers and three-wheelers. However, the agricultural sector remains an exception, with minimal progress in electrifying farming machinery.

Despite being the largest tractor manufacturer globally, India has been slow in adopting electric tractors. The sector faces complex challenges, from limited charging infrastructure to the high initial costs of electric tractors. Nonetheless, industry leaders and the government recognize the need for a shift in agricultural practices. With agriculture accounting for a substantial portion of India's workforce and energy consumption, electrifying this sector could significantly contribute to the nation's sustainable development goals.

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India Report

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The Rise of Electric Tractors: Key Players and Technologies. Recent developments have shown a growing interest in the electrification of agricultural machinery. Companies like AutoNxt Automation, VST, Sonalika Tractors, and Mahindra Tractors are leading the charge in developing electric tractors. AutoNxt, a promising startup, made headlines by launching India's first electric tractor in Thane, Maharashtra. This launch marks a pivotal moment for sustainable farming, offering a cleaner, more cost-effective alternative to traditional diesel-powered tractors.

AutoNxt's electric tractor, equipped with fast-charging capabilities and Level 3 autonomous technology, represents a significant leap in agricultural innovation. The integration of autonomous features, similar to those found in Tesla vehicles, allows the tractor to operate without human intervention within farm boundaries, improving efficiency. With a charging time of just three hours, these electric tractors address one of the primary concerns associated with EV adoption: downtime.

Cost-Effectiveness and Long-Term Savings. One of the most compelling reasons for the shift to electric tractors is their potential for long-term cost savings. While the upfront cost of an electric tractor may be higher than that of a diesel model, the running costs are significantly lower. According to industry research, the cost per kilometer for a diesel tractor is around Rs. 93.5, whereas an electric tractor costs approximately Rs. 14.15 per kilometer. This considerable reduction in operating costs makes electric tractors an attractive option for farmers over the long term.

Challenges and the Road Ahead. While electric tractors hold great promise, several challenges remain. The lack of widespread charging infrastructure in rural areas is a significant hurdle to mass adoption. Additionally, the high initial cost of electric tractors, although offset by long-term savings, may deter small farmers without sufficient financing options.

However, with continued government support, industry collaboration, and technological advancements, these obstacles can be overcome. Union Minister Nitin Gadkari has called on tractor manufacturers to transition to electric alternatives, promising governmental backing for this shift. In response, state governments have started offering incentives to encourage adoption, signaling a brighter future for electric tractors.

Source: *Tractor News* **Read The Article**

PSR Analysis. Electric tractors represent a crucial innovation for India's Agricultural sector. As the government continues to push for electrification across sectors, agriculture stands on the brink of its own transformation. Companies like AutoNxt, VST, Mahindra, and Sonalika are pioneering this change, developing electric tractors that reduce operating costs and also align with India's broader sustainability goals.

While challenges remain, including infrastructure and financing, the future of electric tractors looks promising. By modernizing agriculture, electric tractors will not only make farming more efficient but will also contribute significantly to India's

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India Report

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goal of achieving 30% electric mobility by 2030. With the right mix of innovation, government support, and industry commitment, India's farms could soon be running on clean, electric power, ushering in a new era of sustainable farming. **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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- **OE Link™** – Original Equipment Production and Forecast Data
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- **PartsLink™** – Engine and Original Equipment Population Data
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PSR is the leading source of global production, forecast, and population data for equipment and vehicles powered by IC engines and electric and hybrid powertrains. PSR has been tracking the production of on-highway and off-road vehicles and equipment since 1976. We use this data to develop targeted **forecasts** by industry segment and region. Our team of experienced analysts works with OEMs, engine and component manufacturers, dealers, fleet managers and industry experts to compile detailed and focused data that has become an industry standard. PSR analysts combine our data with industry intelligence to create unique, targeted **solutions** to our clients' needs.

