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Alternative Power Report

By Guy Youngs, Forecast & Adoption Lead

EV Battery Costs Will Drop To Key Level In 2026

Guy Youngs

In 2008, batteries cost $1,355 per kilowatt-hour, and the goal of an $80/kWh EV battery seemed ridiculous. But today the cost of EV batteries is dropping within shouting distance of that $80 goal, pulling the total cost of EV ownership down with it.

The total cost of EV ownership over time, including fuel and maintenance, has been close to, or at parity with, comparable gas automobiles for many years. The deciding factors for specific vehicles vary, but drivers in the US are owning their cars for longer periods — they hit a record average of 12.5 years in 2023 — so that long-term fuel and maintenance savings advantage for EVs can tip the balance.

Even with the total cost advantage and an assist from tax credits, getting prospective EV buyers over the hump of higher upfront costs has been a challenge. The high cost of EV batteries has been the main sticking point

According to a new analysis from Goldman Sachs, Global average battery prices declined from $153 per kilowatt-hour (kWh) in 2022 to $149 in 2023, and they're projected to fall to $111 by the close of this year. They even could fall towards $80/kWh by 2026.

Source: *Clean Technica* **Read The Article**

PSR Analysis: If this is true, it would be great news for anyone purchasing an electric powered vehicle since the battery pack is a significant cost component of any EV. However, over the next few years there is expected to be a gap between available supply of lithium and demand. New lithium sources are being found and developed; however, these can take up to a decade to come to fruition.

Trump Won – What Now for US Clean Energy?

Donald Trump has always pushed for more oil drilling and fewer regulations, left the Paris Agreement in his first term as president, says he hates "windmills," has promised to scrap offshore wind on "day one" if he won the 2024 election, and calls climate change a "scam."

And now that he's won, this is a direct threat to the US's pledge to reach net zero by 2050. After all, federal policy directly impacts the pace of renewable energy growth, especially when it comes to incentives and research funding

Donald Trump will push fossil fuels and undo renewable energy policies, but it ultimately won't stop clean energy's momentum

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

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Alternative Power Report

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PSR Analysis: The clean energy market isn't solely driven by US federal policy. Over the last decade, solar, wind, and EVs have become more cost-competitive and popular. State policies play a huge role too, and many states are committed to their own clean energy goals regardless of who sits in the White House. Only time will tell the true impact of Trump's victory.

Solid-State Batteries Costs Expected To Drop as Pilot Production Begins

The push to commercialize solid-state batteries is underway with industries from automotive to storage betting on the technology. But while the technology has been taking longer than expected to take off, semi-solid-state batteries, which use a hybrid design of solid and liquid electrolyte, have been making steady progress toward commercialization.

The latest findings from Taipei-based intelligence provider TrendForce show that all-solid-state battery production volumes could have GWh levels by 2027. This rapid expansion could lead to cell price declines, reaching the $84-$98 level by 2035.

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

PSR Analysis: The benefits of solid state batteries (higher energy density leading to longer range, rapid charging, safety and lower weigh) are well known. If the costs can come down because of mass production, then this will become a significant game changer.

Nevada Gets World's First Lithium-Sulfur Battery Gigafactory

Super materials trailblazer Lyten will invest over $1 billion to build the world's first lithium-sulfur battery gigafactory in Reno, Nevada. The factory will be capable of producing up to 10 gigawatt-hours (GWh) of batteries annually once it's fully online. Phase 1 is set to go live in 2027.

Lyten's gigafactory will cover 1.25 million square feet on a 125-acre campus in the Reno Air Logistics Park. Initially, it will employ around 200 people, eventually expanding to more than 1,000 jobs

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

PSR Analysis: Lithium-sulfur batteries are considerably lighter than lithium-ion batteries and use materials that are more abundant, so they should have a lower cost than Lithium ion batteries and their widespread use could reduce the pressure on lithium supplies. However, they are less stable and have a shorter lifespan, so unless Lyten has resolved these issue, this approach could backfire. **PSR**

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New York joins Oregon in attempting to flex rules that were supposed to launch in January requiring a percentage of new trucks sold in their states to be zero-emission vehicles.

Global Report

By Chris Fisher, Senior Commercial Vehicle Analyst

Chris Fisher

NY Trucking Group Pushes for Delay of Emissions Mandate

The Trucking Association of New York (TANY), along with Assemblywoman Donna Lupardo and other state transportation stakeholders, called on legislators to reconsider implementation of California Air Resources Board (CARB) Advanced Clean Truck (ACT) regulations set to take effect in the state just more than two months from now.

TANY President Kendra Hems called for an "immediate delay." New York joins Oregon in attempting to flex rules that were supposed to launch in January requiring a percentage of new trucks sold in their states to be zero-emission vehicles.

Roughly 4,000 Class 8 trucks are registered annually in New York, and ACT regulations would require 280 (7% of sales) of them to be zero emissions in 2025 to support total annual retail sales of diesel units.

"Less than 40 have been registered to-date," noted Hems, adding that New York has not installed a single public heavy duty truck charger since the ACT was approved in 2021. "We are no closer today than we were four years ago."

To date, 11 states, including California, New York and Oregon, have pledged to adopt CARB's ACT rule, but the 2025 implementation date is not universal. California kicked off this year. Colorado, Maryland, New Mexico and Rhode Island earmarked 2027, and Vermont 2026.

Under ACT, for every eight diesel units sold in New York, heavy truck dealers in the state would have to sell one BEV first, and Stone noted that "the process of selling a battery electric vehicle can take up to 18 months" with supply chain challenges, infrastructure needs and applying for incentives and grants.

CCJ: NY trucking group pushes for delay of emissions mandate

PSR Analysis. Out of the eleven states planning to implement the CARB type emission regulations, some have pushed the implementation dates out from 2025 into 2026 and 2027 as they begin to realize the barriers to adoption of zero-emission trucks such as high up-front cost, lack of charging infrastructure and duty cycle issues will have a significant negative impact to the industry and likely the state economy, as well. PSR expects this trend to continue until many of the barriers to zero-emission vehicle adoption are resolved or at least improved. **PSR**

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Global Report

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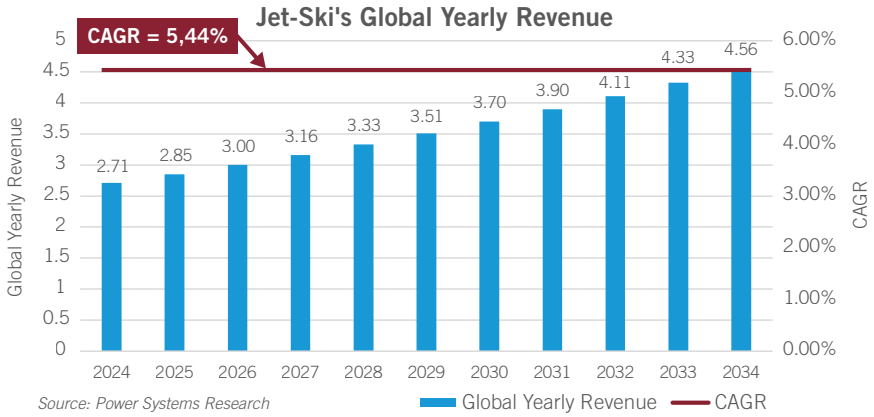
Michael Aistrup

2023 Global Personal Watercraft Market Estimated at US$2.5 Billion

By Michael Aistrup, Senior Analyst

The Personal Watercraft/Jet-ski Market size was valued at USD 2.544 billion in 2023, according to Power Systems Research, and is estimated to register a CAGR of 5.44% between 2024 and 2032.



Market Trends. Manufacturers are investing in developing PWCs made of environmentally friendly materials and e-powered personal watercraft that are cleaner and more efficient.

Manufacturing. There have been many product improvements made recently and more are under development.

- PWC components made of flax plants.
- An engine made of cellulose non-fiber reinforced resin, helping it achieve its carbon-neutrality goals.
- Electric watercraft developed to reduce emission levels, support longer run times and require limited charging infrastructure.
- Solar segments, which is expected to provide higher environmental benefits than electric-operated ones.
- Customization and personalization of watercrafts.
- Changing the engine, color, accessories, and adding or remove any other components, as per their choice
- Rental and sharing watercrafts provide flexibility of using watercrafts when needed, without owning them.

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Global Report

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Growth Drivers. Several factors are pushing the growth of the PWC segment.

- Increasing R&D and product innovation investments provide technological advancements which enhance performance and safety.
- Growing government plans for the tourism industry encourage coordination between manufacturers and tour operators to develop new technologies.
- Expanding rescue operations/coastal patrolling programs enable rescue teams use PWCs to navigate in rough waters.
- Increasing popularity of water sports events increase the demand for high performance vehicles for competition. There's also a growing trend towards outdoor activities.

Industry Challenges. The PWC industry is not without challenges. For example, there are

- Substantial expenses associated with owning and operating a PWC. Repair and maintenance costs such as insurance and storage can be expensive. It's difficult and often expensive to keep a PWC in optimal condition, given the growing complexity of PWC technology
- Environmental Concerns. Irresponsible PWC use can cause increased emissions, noise concerns, disturbance to natural marine habitat, and fuel spills in water bodies leading to water pollution. To avoid such issues, jet skis based on renewable energy and regulations are expected to gain traction.

The PWC Market is poised for growth and growth factors include increasing participation in water sports, expanded government use of PWCs, and innovative new products. Key industry players are focusing on product development and strategic partnerships to meet the evolving needs of consumers. Additionally, the growing popularity of water sports events and competitions is creating a favorable environment for market expansion. **PSR**

DATAPOINT: *North America Combines*

4,500

By Carol Turner, Senior Analyst, Global Operations

4,500 units is the estimate by Power Systems Research of the number of Combines expected to be produced in North America in 2024.

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

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DataPoint

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

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: With 64.5% of total units produced, Deere captured the lead for Combine production in North America (US). In second position, was Case with 20.5%; third, was Claas Omaha with 9%.

Export: Up to 30% worldwide.

Trends. In 2023, production of combines in North America decreased nearly 31%, dropping from 7,161 in 2022, to 4,953 in 2023. Production is expected to drop nearly 9% in 2024.

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

Case attributed the 2023 decline to supply chain issues. Deere announced job cuts at three Midwest production facilities due to softening demand for tractors and combines. "These changes are being made due to reduced demand for the products produced at these facilities," Deere & Co. noted in a news release. "Industry sales are expected to further decline in the back half of fiscal year 2024, Deere said."

Expect production of combines to gain 10% by 2030. **PSR**

Show Report

By Fabio Ferrares, Director Business Development South America

Fabio Ferraresi

Fenatran 2024 International Road Cargo Transport Trade Show

Fenatran is one of the largest transport and logistics fair in Latin America. It is held every other year in São Paulo, Brazil. This year it was held Nov. 4 - 8 and, as usual, introduced significant launches in the road transport sector, focusing on innovation, sustainability, and connectivity.

This year's edition featured 600 exhibitors, including 74 new brands, spread across an area of over 100,000 m²; more than 60,000 people attended.

The Power Systems Research team in South America visited the show to monitor trends, investigate launches announced at the show and meet exhibitors and attendees. **PSR**

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Far East: Japan Report

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

Greenhouse Gases from Mining Equipment Are Targeted

Akihiro Komuro

Reducing greenhouse gas emissions at mining sites is a pressing issue. The number of emissions from mines around the world is about 1.9 to 5.1 billion tons per year, which is more than Japan's annual emissions of about 1.1 billion tons. In addition to methane gas emissions from coal mining, heavy equipment powered by diesel engines is also a source of emissions, and there is a trend toward electrification of mining equipment.

In August, Komatsu announced the development of a diesel-ethanol blended fuel engine. The engine is for large dump trucks, and Komatsu will work with Brazilian mining giant Vale and U.S. engine giant Cummins. Brazil has a high global share of bioethanol production from plant materials. The use of bioethanol is expected to reduce CO_2 emissions by up to 70%. The company wants to put it into practice at Vale's mining sites. In 2023, it signed an agreement with General Motors of the United States to jointly develop hydrogen fuel cell modules. The goal is to install the batteries in large dump trucks with a load capacity of about 290 tons and to start testing them in the second half of the 2020s.

Hitachi Construction Machinery has set a goal of achieving sales of 600 billion yen from its mining equipment business by the fiscal year ending March 2031. The company believes that decarbonization efforts are essential to achieving this goal.

In June, it began a demonstration project to operate catenary-rechargeable electric dump trucks at a mine in Zambia in partnership with First Quantum, a Canadian mining company that owns copper and gold mines.

For battery development, it partnered with ABB, a major Swiss manufacturer of heavy electrical equipment. In September, it invested about 950 million yen in Envirosuite, an Australian company that provides environmental impact analysis services. Envirosuite can monitor air and water quality in real time. It plans to link with the operations management system developed by a subsidiary of Hitachi Construction Machinery and offers customers a service that allows them to carry out work while reducing their environmental impact.

Caterpillar has a plan to install a rail-like charging infrastructure on the side of trucks. This is said to be easier and more flexible to install than overhead wires on top of trucks. In 2023, Caterpillar had a partnership with Albemarle, a major U.S. chemical company, to develop batteries for electric mining trucks and to work on battery recycling.

Sweden's Volvo Group has partnered with Boliden, a major Swedish natural resources company, to begin introducing electric trucks underground starting in 2023.

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Far East Report

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Source: The Nikkei

PSR Analysis: There are various issues surrounding the carbon neutrality of mining equipment, and it is unlikely to become as widespread as cars, but as the article notes, the amount of greenhouse gas emissions from the industry is large. With the demand for resource development expected to continue to grow, mining equipment will continue to be used in the future. If things continue as they are, the amount of greenhouse gas emissions will not decrease, so the efforts of these companies are extremely important.

Actually, this kind of development does not contribute to short-term profits for either mining developers or mining equipment manufacturers. However, neglecting this development could lead to a loss of market share. Major resource companies are rushing to reduce CO2 emissions throughout the supply chain, and there is increasing demand for equipment manufacturers to develop models with low environmental impact. **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

鉱山機械、温暖化ガス削減に向けた開発競争

鉱山現場では温暖化ガスの排出削減が喫緊の課題だ。世界の鉱山からの排出量は年間19億~51億トン程度と、日本国内の年間排出量約11億トンより多い。石炭採掘に伴うメタンガス排出のほか、ディーゼルエンジンで動く重機も排出源となっており、乗用車などと同様に、鉱山機械でも電動化がトレンドとなっている。

コマツは8月、ディーゼルとエタノールの混合燃料型エンジンを開発すると発表した。エンジンは大型ダンプトラック向けでブラジル資源大手ヴァーレ、米エンジン大手カミンズと組む。ブラジルは植物由来のバイオエタノール生産量で高い世界シェアを誇る。バイオエタノールの活用により、最大70%のCO2排出削減効果を見込む。ヴァーレの鉱山現場で実用化を目指す。2023年には米ゼネラル・モーターズと水素燃料電池モジュールの共同開発に関わる契約を交わした。約290トンの積載能力がある大型ダンプトラック向けに電池を組み込み、2020年代後半の試験運用を目指す。

日立建機は2031年3月期までに鉱山機械の関連事業の売上収益を6000億円とする目標を掲げた。目標達成には脱炭素に向けた取り組みが欠かせないとみている。6月には銅・金鉱山を保有するカナダ鉱山会社のファースト・クォンタムと組み、ザンビアの鉱山で架線充電式の電動ダンプトラックの運用実証を始めた。バッテリー開発ではスイス重電大手のABBと協業した。9月には環境負荷の分析サービスを手掛ける豪エンバイロスイートに約9億5000万円を出資した。エンバイロスイートは大気の品質や水質の状態をリアルタイムで監視できる。日立建機の子会社が手掛ける運行管理システムと連携し、環境負荷

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The Asia Zero-Emission Community is a collaborative framework for decarbonization involving nine ASEAN countries (excluding Myanmar), Japan and Australia.

を低減しながら作業を進められるサービスを顧客に提案する計画だ。

米キャタピラーはトラックの側面にレール式の充電インフラを設置する構想を持っている。トラックの上部に設置する架線式に比べると、柔軟な設置がしやすいとされる。キャタピラーは2023年、米化学大手のアルベマールと提携し、鉱山向け電動トラックのバッテリー開発やバッテリーのリサイクルで協業している。

スウェーデンのボルボ・グループは同国資源大手のボリデンと提携し、2023年から地下に電動トラックの導入を始めている。

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: 鉱山機械のカーボンニュートラルには様々な課題があり、自動車のように急速には普及しないが、産業としての温暖化ガス排出量は記事にもあるように非常に大きい。資源開発需要が今後も伸長すると見込まれているため、鉱山機械は今後も忙しく稼働を続けることになる。現状のままでは温暖化ガスの排出量は減らない、そのためこうした各社の取り組みは非常に重要だ。率直に言えばこうした開発は、鉱山開発の事業者にも、鉱山機械のメーカーにとっても、目先の利益には貢献しない。だが、開発を怠れば将来的な市場シェアを落としかねない。資源メジャーはサプライチェーン全体でCO2排出の削減を急いでおり、機械メーカーにも環境負荷の低い機種開発への要求が高まっていく。**PSR**

Southeast Asia Report

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

What Is the Asia Zero-Emission Community?

The Asia Zero-Emission Community is a collaborative framework for decarbonization involving nine ASEAN countries (excluding Myanmar), Japan and Australia. It is abbreviated as AZEC. The first summit was held in December 2023. The principles of the initiative are "decarbonization through diverse pathways that take into account the circumstances of each country" and "simultaneous realization of decarbonization, economic growth, and energy security".

Many countries in Southeast Asia rely on fossil fuels such as coal and natural gas to generate electricity. Japanese companies are driving the adoption of renewable energy, and the Japan government is also providing support through subsidies and other means. As of the end of 2023, 120 cooperation projects have been implemented between Japan and countries in the region.

There is a need to establish internationally reliable systems for calculating and reporting greenhouse gases, but the development of such rules in Southeast

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Southeast Asia Report

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Asia is lagging. If Southeast Asia adopts a framework that is familiar to Japanese companies, based on the Law Concerning the Promotion of Measures to Cope with Global Warming, it will be easier for Japanese companies to enter the market.

The AZEC Leaders' Statement will include a 10-year action plan. In addition to developing Japanese-style rules for calculating and reporting greenhouse gas emissions, it will also promote the provision of so-called "transition finance" and the decarbonization of transportation and electricity.

For companies operating across borders in Southeast Asia, the situation where the system for calculating and reporting emissions differs from country to country is a heavy administrative burden. If the rules can be unified across the AZEC region, it will be easier to track emissions across the supply chain.

This will be a springboard for Japan to take a common approach to the decarbonization efforts it is leading. Countries will also share knowledge on carbon pricing, which imposes economic burdens based on CO2 emissions.

According to the International Energy Agency (IEA), China (33%) and the United States (13%) will rank first and second in terms of their share of global CO2 emissions in 2022. When Japan (3%) and Southeast Asia (4%) are added together, the figure is 7%, which is comparable to the EU. The aim is also to ensure that Japan has some influence in the international community by coordinating its efforts with AZEC.

The Action Plan also includes a timetable for the 2026 AZEC Summit, which will be used to report on progress. Between 2029 and 2034, each country will establish a system for calculating and reporting emissions.

Source: The Nikkei

PSR Analysis: While China and South Korea are also making commitments to Southeast Asia, Japan appears to be taking the lead in formulating these standards. As the amount of greenhouse gas emissions in Southeast Asia is expected to increase due to the region's large population if nothing changes, the move to formulate such a new system should be seen as a positive development.

Examples of Japanese companies already cooperating in the decarbonization process include the following Sojitz Corporation is producing SAF (sustainable aviation fuel) in Thailand, developing a green hydrogen supply network in Laos, introducing renewable energy systems in industrial parks in Vietnam, developing a power transmission network to connect remote islands in Indonesia, and installing ammonia-only gas turbines in Malaysia.

As protectionism spreads around the world, Southeast Asia is trying to counter this trend by clarifying the rules within the region and integrating its economic bloc.
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

アジア・ゼロエミッション共同体とは

アジア・ゼロエミッション共同体とは、日本とミャンマーを除いたASEAN9カ国、オーストラリアによる脱炭素をめざす連携枠組みのことだ。AZECと略す。2023年12月に首脳会合を初開催した。「各国の事情に応じた多様な道筋による脱炭素」や「脱炭素と経済成長、エネルギー安全保障の同時実現」を原則に位置づける。東南アジアは石炭や天然ガスといった化石燃料の発電に頼る国が多い。日本企業は再生可能エネルギーの導入を進め、政府も補助金などで支援する。2023年末以降に日本と域内国で120件の協力案件が実現した。

温暖化ガスの算定と報告には国際的に信頼できる制度を整える必要があるが、東南アジアでこうしたルールの整備は遅れている。日本は地球温暖化対策推進法に基づいて運用しており、日本企業にとっても馴染みがある枠組みを東南アジアが導入すれば、日本企業の参入もよりしやすくなる。

AZECの首脳声明には10年間の行動計画を盛り込む。日本式の温暖化ガス排出量の算定・報告ルール整備に加え「トランジション・ファイナンス」と呼ぶ資金供給の推進や運輸・電力の脱炭素などを柱とする。

東南アジアで国境を越えて事業を展開する企業にとって、国ごとに排出量の算定・報告の仕組みが異なる状況は事務負担が重い。AZEC域内でルールを統一できれば、供給網全体の排出量の把握が容易になる。

日本が主導する脱炭素に向けた取り組みで共同歩調をとる足がかりにする。二酸化炭素（CO2）排出量に応じた経済的な負担をかけるカーボンプライシングなどに関する知見も共有していく。

国際エネルギー機関（IEA）によると、2022年の世界のCO2排出量に占める割合は中国（33%）、米国（13%）が1、2位だった。日本（3%）と東南アジア（4%）を合わせると7%とEUに匹敵する。AZECで歩調を合わせて国際社会で一定の発言力を確保する狙いもある。

行動計画には26年のAZEC首脳会議で準備状況を中間報告するとの工程表も盛り込む。29～34年の間に各国で排出量の算定・報告の制度をそろえていく。

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: 東南アジアへのコミットメントは日本だけでなく中国や韓国も行っているが、こうした基準策定分野においては日本がリードしている様子だ。東南アジアの温暖化ガスの排出量は域内人口の多さから今の状況のままでは増えていくと予見されるため、こうした仕組みを新たに策定しようとする動きはポジティブに受け止められるべきだ。

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すでに日本企業が脱炭素化に協力した例としては以下のような事例が挙げられる。双日がタイで再生航空燃料（SAF）を製造、ラオスでグリーン水素の供給網を整備、ベトナムの工業団地に再生エネルギー設備を導入、インドネシアで離島間を結ぶ送電網の整備、マレーシアでのアンモニア専焼ガスタービンの設置、などだ。

世界各国に保護主義が広がりを見せる中、東南アジアは域内のルールを明確化し、経済圏を統合することでこうした流れに対抗しようとしている。**PSR**

China Report

By Jack Hao, Senior Research Manager - China

Jack Hao

Bosch and Jiangling Plan Joint EV Venture

Bosch and Jiangling Group have signed a joint venture agreement in Nanchang, planning to establish a joint venture to jointly develop and sell electric drive axle systems for light commercial vehicles. The registered capital of the planned joint venture is 500 million yuan (63 million euros), with Bosch holding 60% and Jiangling holding 40%. The newly established company will be mainly responsible for the development, application, production, sales, and service of electric drive axle systems for light commercial vehicles.

Bosch will rely on its experience in electric drive technology to provide core technical capabilities such as electric drive, electric motors, and electric control, while Jiangling Group will contribute its insights in the complete vehicle field and grasp of the local market.

According to Bosch's forecast, about one-third of trucks will be equipped with batteries by 2035. The electrification trend in the mobility sector will help reduce carbon emissions and meet future global energy demands.

Source: *bjcv* **Read The Article**

PSR Analysis: In 2023, the sales volume of new energy commercial vehicles in China reached 447,000 units, a year-on-year increase of 32.3%. This significant growth indicates that the new energy commercial vehicle market is rapidly expanding. In 2023, the market penetration rate of new energy commercial vehicles in China exceeded 11% and maintained a relatively fast growth trend.

From January to September 2024, the penetration rate of new energy commercial vehicles in the commercial vehicle market reached 18%, a considerable improvement over last year. In September, the penetration rate of new energy

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China Report

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commercial vehicles reached 24%, an increase of 10% compared to 14% in September of the previous year.

In urban logistics, public transportation, and sanitation sectors, the demand for new energy commercial vehicles is growing rapidly. Sales of products such as new energy mini-trucks and new energy light buses are both showing an upward trend.

New energy light trucks have advantages over traditional fuel vehicles in terms of purchase tax and vehicle maintenance costs, which are attractive to price-sensitive users. However, progress in the heavy truck sector remains slow. Heavy truck electrification needs to address issues such as battery capacity, load-bearing capacity, and the ability to support infrastructure services. A heavy truck with a battery capacity of around 350kWh can travel about 120 kilometers when fully charged, which limits the long-distance transportation capabilities of electric heavy trucks.

At the same time, the initial purchase cost of electric heavy trucks is high. Although the cost is gradually approaching that of traditional vehicles under the battery swapping model, the overall purchase and operating costs of electric heavy trucks remain a challenge. Heavy trucks are mainly used in long-distance transportation scenarios, which have higher requirements for endurance and refueling facilities. In contrast, light trucks are mainly used in short-distance transportation such as urban logistics, which is more suitable for current electric technology applications. **PSR**

India Report

By Aditya Kondejkar, Research Analyst – South Asia Operations

Ashok Leyland Expects Strong Export Performance

Aditya Kondejkar

"Our next target in terms of geographical expansion is Southeast Asia. We have been talking about it for a long time. We want to get into four different markets in Southeast Asia. "We expanded our range of products (in Middle Eastern markets) and that is why as a result we believe we should be in a position to record one of the best years when it comes to international operations" - Shenu Agarwal, Managing Director and CEO.

Source: *Economic Times* **Read The Article**

PSR Analysis. Ashok Leyland is intensifying its international expansion efforts, setting its sights on Southeast Asia to drive export growth in the coming year. This strategic push is part of a broader plan to strengthen its presence outside India while maintaining strong domestic sales. The company has already launched

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India Report

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Ashok Leyland's focus on alternative fuels and electric vehicles also reflects a strategic alignment with global shifts towards cleaner and more efficient transport solutions.

operations in the Philippines, with Malaysia lined up next, aiming to establish a firm foothold in the region.

Financially, the company's performance in recent quarters has shown resilience and growth. Profits have risen significantly, positioning Ashok Leyland to support its expansion goals and new initiatives effectively. Its electric vehicle arm, Switch Mobility, is a pivotal part of the growth strategy. Specializing in electric buses and light commercial vehicles, Switch Mobility has increased its production capacity, aligning with the rising demand for sustainable transport solutions. The subsidiary is approaching EBITDA break-even, a sign of steady progress and market traction, further supported by a large order backlog.

The company's growth plans aren't without challenges. The medium and heavy commercial vehicle segment experienced a slight slowdown, impacted by weather disruptions and delays in government capital expenditure. However, these factors are viewed as temporary, and Ashok Leyland expects market conditions to stabilize, supporting growth through the remainder of the fiscal year.

Ashok Leyland's focus on alternative fuels and electric vehicles also reflects a strategic alignment with global shifts towards cleaner and more efficient transport solutions. This expansion into emerging markets, coupled with a commitment to sustainable innovation, underscores its intention to be a forward-looking player in the commercial vehicle sector. **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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