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Editor's Note: In this issue of PowerTALK News we introduce a new feature, Alternative Power Report, written by Guy Youngs. The monthly feature will include news and analysis about EV and power sources such as batteries and fuel cells.

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Alternative Power Report

By *Guy Youngs*, Forecast & Adoption Lead

BMW Dedicated To Hydrogen Fuel-cell EVs



*Guy
Youngs*

BMW remains primarily focused on electrified combustion engines and battery electric cars, but it is adamant that hydrogen FCEVs (Fuel Cell Electric Vehicles) will play a part of its transportation package. A limited batch of hydrogen-fueled BMW X5s soon will enter production, and the company says it is already planning for the next model with FCEVs making their way into its 2025 next-generation electric vehicle portfolio

Source: *H2 Energy News* [Read The Article](#)

PSR Analysis: This moves BMW into the Toyota/Hyundai camp supporting FCEV, with Tesla and VW being firmly in favor of battery-powered Electric Vehicles only. BMW is developing its position so that it can offer a full range of alternative power vehicles and meet customer demand whichever way it goes. **PSR**

Australian Solar Park Could Generate Hydrogen for Less Than \$2/kg

Frontier Energy conducted a pre-feasibility study (PFS) at its Bristol Springs Solar project in Australia to show that it has the potential to be a low-cost green hydrogen producer, with power sourced from the company's planned first stage 114 MW DC solar farm. The solar would power a 36.6 MW alkaline electrolyser, producing an estimated 4.4m kilograms of green hydrogen per year.

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

PSR Analysis: With green hydrogen costs being around \$3/kg to \$6.5/kg, production of green hydrogen at this cost significantly boosts the use of hydrogen as a fuel for either Hydrogen ICEs or FCEVs. It also closes the price gap with dirty hydrogen which is generated using fossil fuels. Dirty hydrogen costs around \$1.8 per kg, according to S&P Global. **PSR**

Tesla Offers Lounges at Supercharger Stations with Coffee and Food

Tesla has linked up with bk World to provide its Supercharger stations services to customers while their vehicles charge. Tesla has been trying to deploy its Supercharger stations at properties that include amenities that offer food, coffee, and restrooms, but that is not always easy. At a few locations, Tesla has deployed its own lounges to offer those amenities, including one test site in Germany which even has a swimming pool, and another has a restaurant.

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

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Alternative Power Report

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PSR Analysis: With over 300 lounges planned in Europe, Tesla is trying to make the recharge wait time more enjoyable for customers, and at the same time generate another revenue stream. Providing customers with activities while they wait could encourage charger use and could develop charging stations into a destination location like selling customers of IKEA meatballs when they visit a store. Anything to help relieve the boredom of a charge waiting time that can run to an hour or more is an improvement. **PSR**

BorgWarner Buys EV Charging Company To Boost Growth

Global auto supplier, BorgWarner has announced it is buying EV charging company Rhombus Energy Solutions. The deal will boost its EV charging presence in North America while adding to its European market and will accelerate its charging business by leveraging its existing capabilities. This is the latest in a round of EV related acquisitions the company has made. In August 2021 it took control of AKASOL, (a German EV battery company) and in March 2022, BorgWarner acquired 100% of Santroll Automotive Components (a light vehicle eMotor business).

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

PSR Analysis: This acquisition will generate good revenue for BorgWarner and continues their move into this market. It's also a good example of the many acquisitions that OEMs are making into the broad arena of electric power as they see future opportunities. Other recent examples include: Nikola acquiring Romeo Power to bring its battery supply inhouse, Terex investing in Acculon Energy, and Cummins acquiring Meritor (Cummins believes eAxles will be a critical integration point within hybrid and electric drivetrains). **PSR**

North America Report

By *Chris Fisher*, Senior Commercial Vehicle Analyst



*Chris
Fisher*

Daimler Beefs Up Western Star Brand

For a number of years, we have been hearing rumors that Daimler will likely put the Western Star truck brand out to pasture, primarily due to the brand's low market share in the class 8 truck segment. However, this does not appear to be the case.

During the past two years, Western Star has upgraded or is planning to upgrade their entire truck lineup based upon their current platforms.

Western Star typically focuses on the on-highway vocational side of the heavy truck segment along with other niche applications. **DTNA** has recently placed an

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North America Report

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emphasis on the on-highway vocational segment with both the Freightliner and Western Star brands.

The vocational truck segment represents approximately 25% of the class 8 truck market. This is somewhat low volume when compared to the class 8 freight segment, but the vocational trucks are highly profitable for the OEMs. Also having more diversification within the heavy truck market somewhat shields the OEMs from the volatility of the freight only segment.

Western Star introduced the 49X vocational truck based upon the 4900 platform into production in early 2021. The 49X model is expected to ultimately replace the 4900 model over the next few years. The 49X is equipped with the Detroit DD15 and DD16 and the Cummins X12 and X15 engine offerings. The Detroit engines come standard with the DT12 vocational automated manual transmission while the Cummins engines are available with the Allison automatic transmission or an Eaton manual transmission.

Toward the end of last year, Western Star introduced the 47X vocational truck model based upon the 4700 platform to accommodate the lighter end of the vocational truck segment. Target applications include bulk haul, snowplows and mixers. The 47X comes standard with the Detroit DD13 engine while the Cummins L9 and X12 engines are also available. The 47X has a number of transmission offerings including the Detroit DT12, Allison 3000 and 4000 automatics and the Eaton manual and automated manual transmissions.

Western Star also plans to re-enter the class 8 long haul segment. After ending production of their long-haul 5700 XE at the end of 2021, Western Star plans to introduce the new 57X long haul truck based upon the 5700 platform into production at their Cleveland plant in 2023. The new 57X will be equipped with the Detroit DD13, DD15 and DD16 engine offerings. The 57X will be available with Detroit Powertrain components including Detroit DT12 direct or overdrive AMT transmissions. The DT12 transmissions increase efficiency while reducing fuel consumption. **PSR**

Personal Watercraft Production Grows

By *Michael Aistrup, Senior Analyst*

SUMMARY. Technological advancements in the PWC (Personal Watercraft) market have led to the introduction of quieter and cleaner PWCs. PWC manufacturers have also focused their designs on today's consumer base--families--by continuing to manufacture more of three person models which offer state-of-art features and functions.

The PWC market will continue to grow over the forecast period based on an increase in leisure spending and increasing demand of PWC for utilization in sports.

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North America Report
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The Covid-19 pandemic has disrupted many businesses, regions, and industries. The PWC industry is one of the few industries that has benefited in these uncertain times, registering unexpected growth rates, especially in the US.

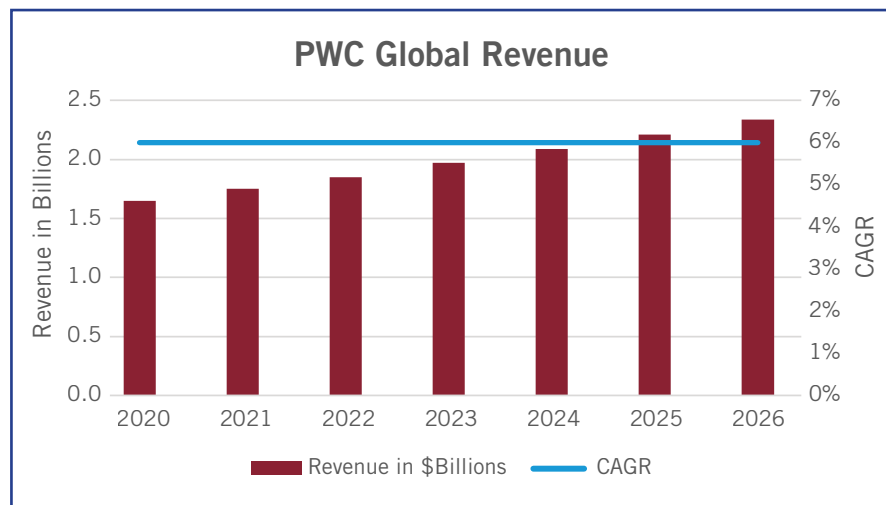
Personal watercraft, also known as a jet ski, is a watercraft having a hull that is driven by an internal water jet pump engine. The PWC is designed in such a way that it does not hold water if it capsizes. PWCs are fast and have the ability to rapidly change direction. PWCs are controlled by a driver who either stands or sits on the watercraft. It is a popular choice for sports and recreational activities.

Initially, PWCs were equipped with a two-stroke engine, but with changing technology, PWCs are now powered with state-of-the-art four stroke engines.

The Covid-19 pandemic has disrupted many businesses, regions, and industries. The PWC industry is one of the few industries that has benefited in these uncertain times, registering unexpected growth rates, especially in the US.

As the global economy mends, the 2022 PWC revenue will grow 6% from 2021. The global PWC market size in 2022 is expected to be \$1.85 billion. The global PWC market size will reach US\$2.34 billion in 2026, growing at a CAGR of 6% over the analysis period.

GLOBAL REVENUE:



The common factor that contributes to the growth of the global PWC market is its increasing popularity for expanded leisure and industrial uses.. The demand for this type of watercraft has been on a rise for the last few years due to their high performance, ability to ride in rough conditions at higher speeds, and easy maneuverability.

DRIVERS-OF DEMAND:

- Growing Tourism industry including recreational activities such as boating and sea cruising.
 - o Asian-Pacific region is a driving factor for the tremendous increase in sales of PWC. The major contributing countries of the region are China and India, owing to enormous population, globalization, and increase in the standard of living.
 - o Utilization as a recreational and sporting alternative.
- Increased consumer disposable income.
- Increased construction of marinas.

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North America Report

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- Lower fuel costs compared with other types of watercraft.
- Advancements in technology to produce cleaner and quieter watercraft.
- Growing use among maritime police organizations.
- Growing availability of multi-passenger personal watercraft
- Stricter emission controls and safety regulations could slow the growth of the PWC market. OEMs are responding by investing in new technologies that could increase the initial cost of the PWC.

REGIONAL OUTLOOK OF THE PWC MARKET. North America is expected to remain the largest market for PWC during the forecast period. In 2021, the North America region accounted for over 80% share of the global market. This is largely due to the presence of numerous OEMs and the increasing demand for PWC in the region for recreational and sports applications. Likewise, increasing investments in sports and recreational activities in several European countries is expected to drive the region's PWC market during the forecast period.

BRP, Yamaha Motor and Kawasaki are the top three global manufacturers holding over 90% of the global PWC industry. **PSR**

DATAPOINT: North America Tillers

245,000

By *Carol Turner, Senior Analyst, Global Operations*

Tillers are used to cultivate soil to prepare a smooth area for planting. These are self-propelled, walk-behind machines which are used for home gardens or small farm areas.

245,000 units is the estimate by Power Systems Research of the number of Tillers to be produced in North America (United States and Mexico) in 2022.

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

Exports: Mexico: up to 65% worldwide. United States: up to 25% worldwide.

Market Share: With 39.5% of total units produced, Schiller Grounds Care leads in production of Tillers in North America. With combined plant totals of 37.5% (Mexico and US), MTD is in second place. Third, is Honda Power with 11.5%.

Trends: In 2021, production of Tillers in North America decreased 15%. Production is expected to increase 2.3% in 2022, compared to 2021. The decrease in 2021 was caused by Husqvarna discontinuing its line of tillers along with Cub Cadet, Columbia and Craftsman branded units being terminated in 2020 at the MTD Tupelo, MS plant. Husqvarna's decision to cease tiller production was due to recall circumstances.

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Datapoint

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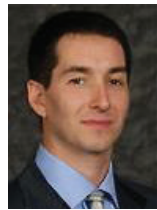
German OEM Jungheinrich has accomplished a remarkable goal, delivering its 100,000th lithium-ion Forklift truck.

The increase this year is driven by home owners using tillers to maintain their yards; there has been a constant demand for tillers in both the commercial and residential sectors. Consumers are increasingly willing to spend their disposable incomes on durable goods, landscaping services, and recreational activities, boosting demand for both consumer and commercial outdoor power equipment. Expect production to increase 10% by 2025. **PSR**

Europe Report

By *Emiliano Marzoli*, Manager – European Operations

100,000th Lithium-Ion Forklift for Jungheinrich



Emiliano Marzoli

German OEM Jungheinrich has accomplished a remarkable goal, delivering its 100,000th lithium-ion Forklift truck. An ETV 216i Reach truck was the star of this milestone, with 15 other identical models delivered to the Amazon warehouse in Leipzig.

In 2011, Jungheinrich was the world's first industrial truck manufacturer to launch a series-produced truck with a lithium-ion battery. Since then, lithium-ion technology has become the fastest-growing battery technology for industrial trucks.

Read The Article

PSR Analysis: According to Jungheinrich, compared to a diesel truck of the same performance class, an electric truck with a lithium-ion battery emits less than half the CO₂ during its entire lifetime, including its manufacture. By using electricity from renewable energy sources, the CO₂ emissions of the vehicles in operation can be reduced by up to 90%. It is not a surprise to see the increase of battery electric trucks in the European production mix.

According to the Power Systems Research Database OE Link™ electric trucks (with different types of batteries) have been growing rapidly in recent years. After their mass adoption in 2011, EV forklifts rapidly became the standard in Europe, and we forecast that in coming years they will further increase their shares up to 87% in 2027.

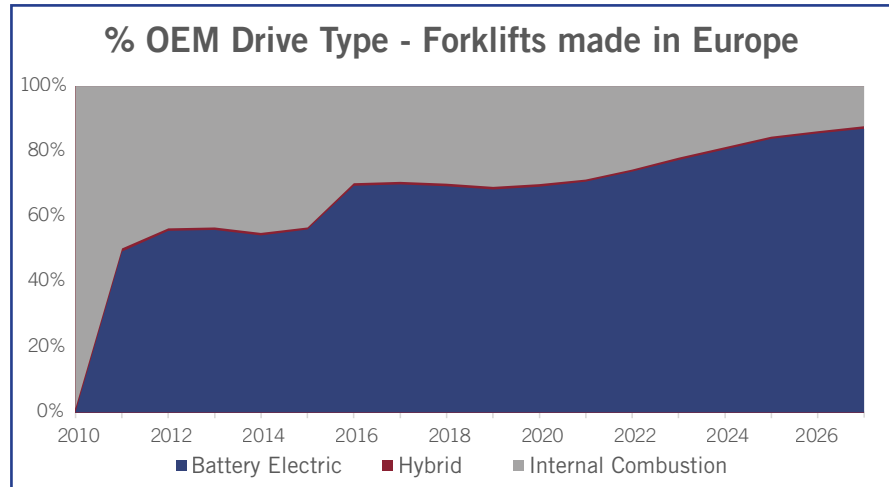
Vehicles powered by lithium-ion batteries will dominate the market, with other solutions used only in niche applications. Another interesting point to consider is the failure of Hybrid trucks. This solution was introduced just a few years before battery-powered products, but never caught on, mainly due to the rapid development and clear advantages of the full electric products. We expect Hybrid forklifts to represent an irrelevant 0.5% of forklifts made in Europe by 2027.

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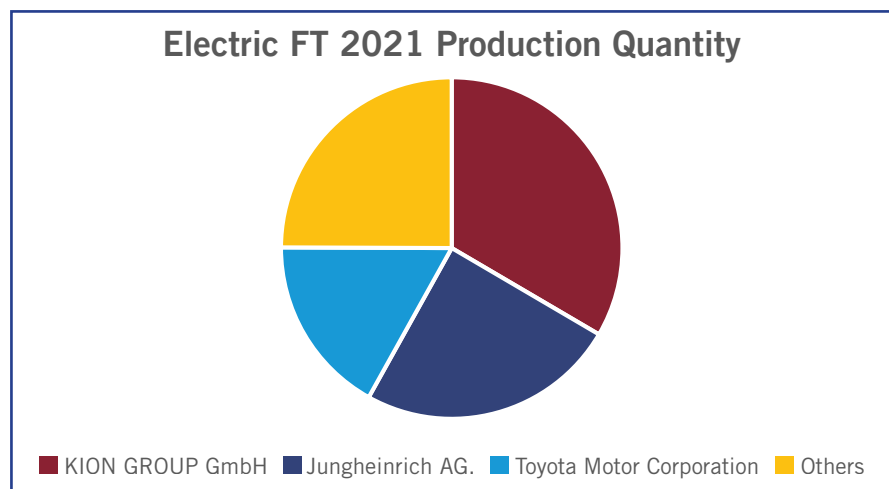
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Europe Report

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The manufacturing of electric Forklift Trucks in Europe is dominated by three players, the KION Group, Jungheinrich and Toyota. As a result, five different brands have more than 75% of the total units made.



Beyond 2027, we expect Electric Forklift Trucks to continue their growth, driven by more stringent emission regulations, and by more demand from the logistic industry. We are monitoring the adoption of different alternative zero emissions technologies that will shape the long-term future of this industry. **PSR**

MAN New Generation Engine To Be Launched at Cannes Yacht Festival

By *Natasa Mulahalilovic*, Marine Analyst – Europe

Four years after introducing the most powerful engine for yachts, the V12-2000, MAN Truck and Bus has launched a new generation, high speed engine, the V12X. The official launch will take place at the Cannes Yacht Festival in France at the French Riviera Old Port, Sept. 6-11.

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Europe Report

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The full range of the MAN diesel engines recently have been approved for use of a “green” fuel obtained from waste and residues of animal and plant origin, cellulosic biomass and hydrotreated vegetable oils (HVO).

The latest MAN creation develops 2200 HP (1618 kw) at 2300 rpm. The 12-cylinder engine, with 30 liters displacement is unique in the marine pleasure market.



Natasa
Mulahalilovic

As all other MAN compact, high speed, diesel engines, the V12X fully meets the EPA Tier 3 recreational, China Marine Recreational Stage II, IMO Tier II and RCD 2013/53/UE, 97/68/EC emission standards and directives.

The new engine is designed for installation into medium and larger size motor yachts, sport fishing boats and cruisers. MAN Truck and Bus has a strong and lengthy collaboration with many yacht builders such as Azimut-Benetti group, Beneteau Yachts, Ferretti Group, Princess Yachts and others.

Werner Kübler, head of the MAN engineering department, says that the V12X engine marks the start of the next generation of yacht engines. “We are acknowledging this milestone in engine technology with the new name V12X and giving the distinctive engine cover an X design. The redesign of the MAN V12X is accompanied by extra displacement for shipyards. As always, we have retained the excellent power-to-weight ratio that MAN engines are known for.”

The full range of the MAN diesel engines (6, 8 and 12-cylinder engines with the power of 730 to 2000 hp) recently have been approved for use of a “green” fuel obtained from waste and residues of animal and plant origin, cellulosic biomass and hydrotreated vegetable oils (HVO). Engines potentially using a renewable diesel fuel release approximately 30% fewer particles and approximately 10% less nitrogen oxide. Use of renewable diesel fuel contributes to sustainable boating without loses in the drive’s efficiency. **PSR**

Brazil/South America Report

By *Fabio Ferraresi*, Director Business Development-South America




Fabio
Ferraresi

Highway Implement Registrations Continue High in Brazil

July registrations of implements (trailer and over-chassis) reached 13,133 units, above the January to May average of 12,500 units. ANFIR (National Association of Road Implement Manufacturers) forecast is to reach 165,000 unit registrations in 2022, slightly above the 163,000 registered last year.

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

PSR Analysis: The trailers and over-chassis implement supply chain has fewer constraints than the Truck supply chain. While the market is influenced by

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South America Report

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the same drivers, the atypical stops due to shortage of components make the Trailer market an indicator of the Truck Market without the constraints. The positive outlook either in terms of actual sales and the forecast made by the OEM reinforces the forecast of a strong MHV production and sales numbers for the second half of 2022.

Volvo EV Bus Planned for Brazil in 2023

Volvo's EV bus is now in the homologation phase in Brazil. Initially it will be produced in Sweden, with plans to be produced in Brazil for the South America market. The Curitiba plant engineering has participated significantly in the Bus Development.

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

PSR Analysis: Volvo adapt its line-up to compete in the Brazil and South America market that will demand significant part of the volume for the EV models. It is slightly behind Mercedes and Marcopolo with its own bus, but still able to catch-up and compete in main markets.

Mercedes To Deliver 1000 EV Bus by 2023 to São Paulo

During the Lat.Bus show in São Paulo, the Sales Director of Mercedes, Walter Barbosa, affirmed the demand of 500 EV Bus in 2022 and 500 in 2023, but he expects no deliveries in 2022 with all units being delivered in 2023.

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

PSR Analysis: Mercedes is running against the clock to win the business in São Paulo. Although it is preferred by the public transportation companies, BYD is ahead with product already developed. Marcopolo shows as a solution with own chassis and body, but still in early stages of launch.

Marcopolo Plans To Deliver 30 EV Buses in 2022

Formerly using chassis built by other companies, mainly BYD, Marcopolo has announced plans to build its own EV chassis. It plans to produce and offer a complete set of bus chassis and bus body. It plans to deliver 30 units in different setups for Brazilian cities in 2023.

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

PSR Analysis: Marcopolo is betting that its own chassis is more competitive for the market from an engineering and product standpoint. While preparing to compete with its chassis suppliers and partners in the EV segment, it still depends on them for the main volume of transit and intercity buses that is ICE powered. **PSR**

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China Report

By *Jack Hao*, Senior Research Manager - China



*Jack
Hao*

Chinese IV Standard for Off-road Machinery To Be Implemented Dec. 1

On Dec. 29, 2020, the Ministry of ecology and environment announced that Dec. 1, 2022, all off-road mobile machines below 560kw (including 560kw) produced, imported and sold and their diesel engines installed shall meet the requirements of the Chinese IV emission standard.

The implementation time of Chinese IV emission of off-road mobile machinery above 560kw and its installed diesel engines will be announced separately.

In 2022, due to adverse factors at home and abroad, enterprises in the industry will generally face market pressure. In order to better switch the upgrading of Chinese IV emission standards from the aspects of supply chain and industrial chain, steadily promote the implementation of Chinese IV emission standards, reduce the operating pressure of enterprises, and maintain the stable and sustainable development of the industry, the Association recently submitted the "request for instructions on the implementation time delay of Chinese IV emission standards for off-road mobile construction machinery" to the atmospheric environment department of the Ministry of ecological environment according to the policy advice and suggestions of enterprises on Chinese IV emission, It is suggested that the conversion time of the whole machine products with the national three emission standards for construction machinery to the national four emission standards be postponed from December 1, 2022 to April 1, 2023. Regarding the application submitted by the association to the Ministry of ecology and environment for "postponing the implementation time of the 'National four' emission standard for off-road mobile construction machinery", the Association received a clear reply: it will not be further extended! Therefore, the "national four" emission standards for off-road mobile machinery will be switched as scheduled from December 1, 2022.

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

PSR Analysis: The effective date of the Chinese IV will be Dec. 1, 2022, less than four months. Under the heavy pressure of environmental protection and the impact of the epidemic, the standard switching time is tight, and the task is difficult. It is urgent to upgrade technology and clear inventory.

After the standard switch, the inventory equipment of Chinese III that cannot be digested as scheduled can only be cleared in the form of secondhand machines in 2023. It is inevitable that the sales of Chinese IV machines will be impacted in such a short time.

After five years of quick growth rate, the construction machinery industry will enter a downward cycle in the second half of 2022. Due to the downward cycle of

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China Report

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Since 2020, most of the host enterprises and their supporting parts enterprises have released a full range of products aimed at the national four emissions.

the industry and the impact of the epidemic, the market sales volume in 2022 is less than expected, and many main engine manufacturers are overstocked with Chinese III equipment.

Therefore, due to the tight time and heavy tasks of the Chinese IV emission standards, the industrial enterprises are facing many difficulties such as environmental protection, technology upgrading and inventory clearing. We hope that with the joint efforts of all sectors of the industry, the industrial enterprises can ride the wind and tide and smoothly get out of the current difficulties.

The implementation of the Chinese IV emission standard has been delayed several times. The environmental protection department hopes to implement the fourth national emission standard as soon as possible. However, for most users in the industry, the premature implementation of the Chinese IV emission standards will inevitably lead to hasty preparation, and the failure of oil products in some areas will also bring difficulties to the formal implementation. Therefore, the implementation time has been postponed several times.

In 2021, the Beijing IV emission standard was implemented, and the oil and technology problems that have troubled the Chinese IV emission standard have been overcome. It is natural to implement the Chinese IV emission standard; Second, enterprises and users have prepared for the implementation of the Chinese IV emission standards.

Since 2020, most of the host enterprises and their supporting parts enterprises have released a full range of products aimed at the national four emissions. Almost all enterprises have made thorough preparations according to the official implementation of the national four emissions on December 1, 2022. The same is true for users. If the implementation of the Chinese IV Day is postponed to April 1, 2023, it will not hinder the launch and sales of the Chinese IV products, except that it will give enterprises more months to digest the Chinese III Day inventory. Moreover, in the current market downturn, most enterprises have put their efforts on the fourth national market. **PSR**

Far East: Japan Report

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

Hino Motors' Engine Fraud Covers 560,000 vehicles

Hino Motors has announced that the falsification of diesel engine emission values, which was previously announced in March, had been taking place since at least 2003 or earlier. The company had previously stated that the fraud began in the fall of 2016. In 2016, the company also revealed that it had falsely reported to the MLIT (Ministry of Land, Infrastructure, Transport, and Tourism) in response to its request for a fact-finding survey on exhaust gas and fuel efficiency tests.

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Far East Report

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The impact on the industry of the fraud at Hino, which has the top share of the medium- and heavy-duty truck sector in Japan, is significant.



Akihiro
Komuro

Source: *The Nikkei*

PSR Analysis: Although I do not wish to make such negativity a theme, I cannot overlook this issue. The impact on the industry of the fraud at Hino, which has the top share of the medium- and heavy-duty truck sector in Japan, is significant. Isuzu has suspended shipments of four bus models that use Hino engines. Not limited to the automotive field, Tadano cranes, Kobelco hydraulic excavators, Hitachi Construction Machinery wheel loaders, and Kato rough terrain cranes have also been forced to suspend shipments after the problem came to light.

There have been countless cases of automobile manufacturers falsifying engine performance in the past. It is a fact that many manufacturers, both domestic and foreign, have engaged in this type of fraud over the years. Here are just a few examples:

- The Dieseldgate incident, commonly known as Dieseldgate by VW, reported in September 2015. https://en.wikipedia.org/wiki/Volkswagen_emissions_scandal
- Falsified fuel economy figures for mini cars by Mitsubishi and Nissan reported in April 2016
- Falsified fuel economy figures by Suzuki in 2016

This information has not yet been compiled into a report by investigators. They are in the process of being reported by media at this time. Hino has been issuing press releases and holding press conferences but has not yet issued any kind of report on the completion of the investigation.

At this point, the investigation is limited to vehicles for the domestic market and does not cover vehicles for the North American and Southeast Asian markets. In any case, it will not be easy to regain the trust that has been lost. The Ministry of Land, Infrastructure, Transport, and Tourism is furious and has imposed a rather severe punishment. The engine's environmental performance, which they had been touting, was an illusion. It is very sad to see this issue, which seriously damages the reputation of "Made in Japan" built up by our predecessors. **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

日野自動車エンジン不正、2003年以前から 対象56万台に

日野自動車は、3月に公表したディーゼルエンジンの排ガス数値の改ざんについて、少なくとも2003年以前から行われていたと発表した。従来は不正開始時期について2016年秋以降と説明していたが、より長期間にわたって不正が続けられていた。対象車両も判明しただけで2009年以降で56万7千台にのぼり、これまで公表していた約12万台から大幅に拡大する。2016年、国土交通省が

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ら求められた排ガスや燃費試験を巡る実態調査に対して虚偽報告していたことも明らかにした。

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: こうしたネガティブなことをテーマにしたいわけではないが、この問題は看過できない。中大型トラック分野で国内トップシェアを持つ日野の不正が業界に与えるインパクトは大きい。いずれは日野のエンジンを採用しているバス4車種の出荷を停止した。自動車の分野に限らず、タダノのクレーンや、コベルコの油圧ショベル、日立建機のホイールローダー、加藤製作所のラフテレーンクレーンなども、この問題が明るみに出たことで出荷停止を余儀なくされている。

自動車メーカーがエンジンの性能を偽った事例は過去にも枚挙にいとまがない。例示は避けるが、国内外を問わず多くのメーカーがこうした不正を長年に渡って行ってきたことは事実だ。この報道で日野自動車のすべての問題が明るみに出たとは言えない。現時点で調査対象は国内向けの車両に限定されており、北米や東南アジア向けは対象外だからだ。いずれにしても失われた信頼を取り戻すのは容易なことではない。国交省は激怒しており、かなり厳しい処分を下している。彼らがアピールしてきたエンジンの対環境性能は幻だった。先人たちが築き上げてきたメイドインジャパンの評価を著しく毀損するこの問題は、とても悲しいものだ。 **PSR**

Far East: South Korea Report

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

Hyundai Doosan Infracore Plans Hydrogen Engine

Hyundai Doosan Infracore announced that it has been selected as the lead company for the national project "Development of Hydrogen Engine System and Storage and Supply System for Construction Machinery and Commercial Vehicles" by the Industrial Technology Evaluation and Management Agency.

Through this project, the company plans to develop a 300kW, 11-liter class hydrogen engine and hydrogen tank system with zero carbon emissions, which will be installed in commercial vehicles such as trucks and large buses, and construction equipment such as excavators by 2024. After verification, the company aims to begin full-scale mass production in 2025.

"Although hydrogen engines have high energy density, they are expensive and require technological maturity to ensure durability under adverse operating conditions," said a company official. "For this reason, the engine system is more suitable for construction machinery and medium- to large-sized commercial vehicles than for passenger cars."

Source: Wow! Korea

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Far East Report

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PSR Analysis: Hydrogen products in Korea are still far from practical at this point. Hydrogen can be classified as green, blue, or gray depending on the cleanliness of the production process, and the hydrogen fuel cell power plant in Korea that began operating in June emits 10 tons of carbon for every ton of hydrogen it produces. At this point, Korea's hydrogen industry is still in the gray stage, but I do not think it is time to discuss whether the technology is good or bad, as it will take time for the technology to become more advanced.

The idea that hydrogen is better suited for medium- and heavy-duty commercial vehicles than for passenger cars makes a lot of sense. However, mass production of a commercial model by 2024 is certainly a very high goal. With the lithium-ion battery industry currently thriving in South Korea, I will keep a close eye on the future development of hydrogen in the country. **PSR**

極東 > 韓国レポート:

小室 明大 – 極東及び東南アジア リサーチアナリスト

現代斗山インフラコアが水素エンジンの開発に着手

現代斗山インフラコアは、産業技術評価管理院の国策課題「建設機械・商用車用の水素エンジンシステムおよび貯蔵・供給系の開発」の主管社として選出されたと発表した。同社は今回の事業を通じて、炭素排出ゼロの実現が可能な出力300kW、排気量11リットルクラスの水素エンジンと水素タンクシステムを開発する予定だ。2024年までに、トラックや大型バスといった商用車や、掘削機などの建設機械に水素エンジンを搭載。検証を経て、2025年の本格的な量産開始を目指す。

同社の関係者は「水素エンジンは高エネルギー密度ではあるが高価で、また劣悪な使用環境下での耐久性確保など技術的な成熟度が求められるという短所があった。このため乗用車よりも、建設機械や中・大型商用車に適したエンジンシステムとして挙げられている」と説明した。

出典: Wow!Korea (一部筆者により元記事内容を改編しました)

PSR 分析: 韓国の水素エネルギー研究と開発は、現時点ではまだ実用化には遠い。水素は生産過程のクリーンレベルにより、グリーン、ブルー、グレーなどに分けられる。6月に稼働し始めた水素燃料電池発電所では、水素を1トン製造するのに炭素を10トン排出してしまう、という段階だ。つまり現時点では韓国の水素産業はまだグレーの段階にあると言えるわけだが、とはいえこうした技術の高度化には時間がかかるものであり、現時点では良か不良を論じる段階ではないと私は考える。

水素は乗用車よりも中・大型商用車に適しているという考え方は極めて理にかなったものである。だが、2024年までに実用モデルを量産というのはかなり高い目標であることは間違いない。目下リチウムイオン電池産業が隆盛である韓国における水素が今後どのように発展するかを注視していきたい。 **PSR**

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India Report

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



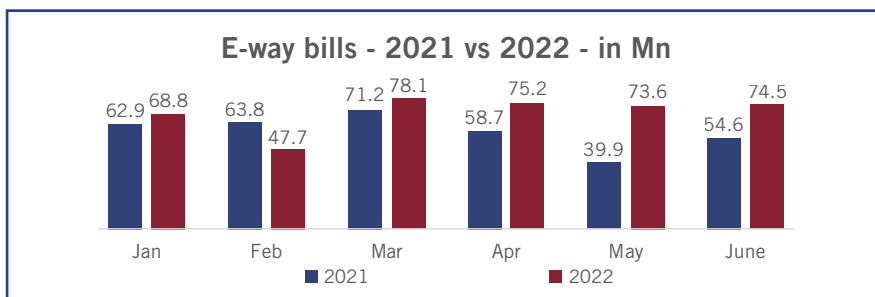
*Aditya
Kondejkar*

CV Industry Is Moving in Top Gear

The commercial industry will grow with trucks and buses expected to do well. Truck sales will improve as many industries require more units as they are running at full capacity

The Indian economy managed to revive itself during the first and second COVID waves and quickly achieved a V-shaped recovery.

This year, GST (Goods and Services Tax) is reaching high levels. GST collection has witnessed a growth of 26% YoY – YTD CY22. Furthermore, the generation of e-way bills is increasing rapidly. The generation of e-way bills is directly proportional to truck utilization and drives vehicle demand.



The goods carrier segment performance is closely aligned with the country's GDP – which can be tracked from GST collections, and the way in which the macro-economic situation is improving, the industry sentiments seem to be very positive. This will be reflected in the overall CV production in the months and quarters ahead.

All the sectors of the economy are seeing momentum, and truck utilization levels are breaking records. Truck utilization has continuously remained above the last year's levels. Improving demand from the core sectors like infrastructure, mining, steel, and cement is anticipated to provide the much needed thrust for the CV industry.

In the past few months, fuel prices have remained stable, while freight rates improved significantly. As a result, operators are seeing an increase in profitability. These positive sentiments will drive the new purchases.

Source: *DT Next* [Read The Article](#)

PSR Analysis. We expect a favorable business environment in the current year despite ongoing semiconductor shortages, which is the biggest hurdle in meeting increased demand.

Since 2020, the CV industry has lost volumes because of pandemic-related disruptions and delayed replacement demand.

The CV industry's channel inventory is stressed due to the mismatch in supply and demand. The channel inventory has been low, at about 10 days against an average of

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4-5 weeks. We hope that this year the supply chain situation will continue to improve without disruptions. Also, the semiconductor shortage situation might start easing out.

Hence, we believe the CV industry will continue its growth until the general election that is scheduled in 2024. We might see a post-election dip in 2024, but the industry is not expected to face severe headwinds and will equal 2018 volumes in 2027. **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 have maintained a presence in Russia since 2013 to bring important updates to our clients about the powered equipment markets within Russia. We are monitoring the current situation on a daily basis and hope to again establish this presence when the conflict with Ukraine is resolved. Please contact us at info@powersys.com if you have questions regarding business conditions in Russia. Thank you. **PSR**

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