

Automotive Industry Weekly Digest

04April – 08April2022





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[OEM Highlights] NIO begins deliveries of ET7 electric sedan in China

NIO began deliveries of the ET7 electric sedan in China on 28 March. The first customers of the ET7 were handed over their vehicle keys during a ceremony held at NIO's Hefei plant. The ET7 is a full-size electric sedan that is 5,101 mm long, 1,987 mm wide, and 1,509 mm tall with a wheelbase of 2,060 mm. Two models are currently available for reservations: the First Edition comes with a 100-kWh battery pack and all-wheel drive as standard, while the standard dual-motor model will provide customers the option for a 75-kWh or a 100-kWh battery pack. NIO claims that the First Edition model can deliver a range of 675 km under the China Light Duty Vehicle Test Cycle (CLTC), while the dual-motor model with a smaller 75-kWh battery can provide a range of 530 km. Both models deliver a maximum output of 480 kW and a peak torque of 850 N.m.



Outlook and implications

The ET7's production will continue to take place at the NIO-JAC Hefei plant, which produces the NIO ES6, EC6, and ES8. The automaker expects production pace for the ET7 to reach desired capacity levels in the third quarter of 2022. The ET7 will become the first vehicle in NIO's line-up to have a full suite of hardware and software needed to enable the rollout of NIO's Autonomous Driving (NAD). The vehicle is powered by four Nvidia Orin chips that provide up to 1,016 TOPS of computing power. NAD will allow the vehicle to perform automated vehicle operation in various driving scenarios including highway and city auto pilot, auto parking into parking lots, and auto parking into battery-swapping stations. NIO is expected to release NAD in the fourth quarter of 2022.

[OEM Highlights] Polestar starts US deliveries of Polestar 2 single-motor EV

Polestar 2 single-motor electric vehicle (EV) deliveries have now started, with a price that Polestar said can be as low as USD33,400 with US federal and local incentives. The single-motor version of the Polestar 2 offers 270 miles of range, more than the higher-horsepower dual motor. Without federal or local incentives, the vehicle starts at USD45,900. The new version offers Plus and Pilot option packages. The Plus pack, at USD4,000, adds a new-for-2022 mechanical heat pump to extend range, a full-length panoramic glass roof, an uplevel Harman Kardon audio system, and vegan interior upholstery. The Pilot Pack (USD3,200) brings more driver assist programmes, including pilot assist, adaptive cruise control, and blind spot information. Polestar's US retail locations have grown to include locations in US states of California, Colorado, New Jersey, Texas, Minnesota, Washington, Georgia, and Michigan.



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Outlook and implications

Polestar is targeting sales of 65,000 units in 2022, and the new more-accessible version can help the cause. IHS Markit forecasts that Polestar's US sales will reach 22,000 units in 2025, with a relatively slow ramp up from about 5,400 units in 2022. Along with the additional Polestar 2 variant, the brand will see a stronger boost from the Polestar 3 utility vehicle, which is also due for production in the US. By 2025, the brand's stable in the US should include the Polestar 2, Polestar 3, Polestar 4, and Polestar 5. Increasing the segments it serves is important to increase accessibility and volume.



[Technology & Mobility Highlights] BYD, Shell to jointly develop EV charging network in China and Europe

Chinese automaker BYD and global energy major Shell have announced plans to jointly develop an electric vehicle (EV) charging network in China and Europe. According to Electrek, the joint venture (JV) is likely to operate more than 10,000 EV charging points in Shenzhen first, and then expand its businesses to other cities. In Europe, BYD and Shell plan to establish a Mobility Service Provider (MSP) partnership, under which Shell will offer over 275,000 EV chargers on its roaming network to BYD's customers. The duo will also work on setting up service centres for EVs in key European markets; explore opportunities to provide integrated home energy solutions including home energy storage devices and vehicle-to-grid (V2G) charging and explore possibility of a global R&D partnership pertaining to battery performance.



Outlook and implications

Shell has recently signed a similar deal with Hyundai to collaborate on EV charging infrastructure, hydrogen, digitalisation, and low-emission energy solutions. The two companies plan to establish EV chargers at Shell filling stations initially in Asian countries as local demand for EVs is on the rise, and then add more regions to the network in stages. Hyundai and Shell will also provide various charging perks for greater driver convenience in the European market, which already has more charging infrastructure. In Germany, the UK, and Switzerland, Genesis and Shell Recharge Solutions are considering forming an MSP relationship. Shell already has an agreement with Chinese EV player NIO for the development of co-branded battery-swapping stations. The plan is to reach 100 sites by 2025 starting with two pilot sites. Under the agreement, Shell will offer Shell Recharge high-speed charging at NIO locations and make battery swapping available at select Shell locations. Co-operation in Europe will start from exploring pilots in 2022. Shell is also focusing on expanding its presence as a provider of hydrogen fuel in China and unveiled a power-to-hydrogen electrolyser and hydrogen refuelling station in Zhangjiakou, Hebei province. The project will be able to fuel a fleet of more than 600 fuel cell vehicles.

[Technology & Mobility Highlights] Geely launches trial programmes for methanol-fuelled vehicle in Denmark

Chinese automaker Geely has joined up with Circle K Denmark, Aalborg University, and Fonden Green Hub Denmark to collaborate on a 15-month test and demonstration trial for green e-methanol fuel and methanol vehicles in Denmark. Geely has provided two Geely-branded Emgrand methanol sedans and the Farizon M100 heavy truck from Geely's commercial vehicle division to its Danish partners as part of the long-term trial. In the future, Geely said its methanol vehicles will undergo EU certification and promotion to other European markets in support of accelerating the goal of reaching carbon neutrality.



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Outlook and implications

Geely is a major producer of methanol-fuelled vehicles in China. The automaker has invested over CNY3 billion (USD471 million) in developing methanol vehicles and green methanol technologies over the past 17 years. Geely said it chose Denmark for the trial programmes of its methanol-fuelled vehicles because the country has established a strong infrastructure foundation for the production, storage, and transport of methanol fuel. The aim of its collaboration with Denmark is the promotion of green e-methanol and green mobility in Europe, leveraging the Power-to-X technology, a technology that converts renewable electricity from solar or wind farms into other forms of energy, such as green hydrogen or green methanol. According to China Daily, the Danish government announced a broad agreement on Power-to-X energy production that includes a government tender of DKK1.25 billion (USD184 million). The port of Aalborg is set to invest DKK2 billion in green transportation.



[EV & Energy Efficiency Highlights] China aims to put 50,000 hydrogen FCVs on roads by 2025

China aims to put 50,000 hydrogen fuel-cell vehicles (FCVs) on the roads by 2025, according to the Hydrogen Industry Development Plan 2021–35 published by China's top industry planner, the National Development and Reform Commission (NDRC). To support the promotion of hydrogen FCVs, the country will continue to invest in hydrogen refuelling stations, according to the document. A target has been set for the output of hydrogen produced from renewable resources to reach 100,000 to 200,000 tonnes per year by 2025. In terms of its longer-term targets, the NDRC aims to form a complete hydrogen industrial system and a hydrogen application ecosystem that covers multiple areas such as transportation, energy storage, and industry.



Outlook and implications

Data from the China Association of Auto Manufacturers suggested that FCV sales in China increased 35% year on year in 2021 to around 1,600 units, with the majority of these being commercial vehicles, including logistical vans and buses. There is still huge potential for hydrogen FCVs to have wider applications in the commercial vehicle sector as a supplement to battery electric vehicles. The development plan itself does not include investment targets, but still it sends an important signal to both private and public-sector investors that hydrogen has a major role to play in helping China achieve its climate targets and as part of the country's energy mix. Shell unveiled a power-to-hydrogen electrolyser and hydrogen refuelling station in Zhangjiakou, Hebei province, in February. The project provided fuel for a fleet of more than 600 FCVs at the Zhangjiakou competition zone during the Beijing 2022 Winter Olympics. The 20-megawatt (MW) power-to-hydrogen electrolyser is Shell's first commercial hydrogen development project in China.

[EV & Energy Efficiency Highlights] Hainan province to install 20,000 new charging piles this year

China's Hainan province has announced plans to install 20,000 new charging piles in 2022. According to the China Daily citing a plan issued by the Hainan provincial development and reform commission, the authorities will focus on setting up the charging infrastructure in rural areas, residential compounds, and highway service centres. The plan aims for at least 30% of townships in a city or a county to have a charging station with five piles.



Outlook and implications



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Hainan is one of the most active provinces in China leading the adoption of new energy vehicles (NEVs) in public transportation. It aims to stop sales of traditionally fuelled vehicles by 2030. In 2020, the Hainan Transportation Bureau issued a statement last year requiring the province to adopt NEVs, primarily battery electric vehicles, in its public transport system. Specifically, it stipulated that all new vehicles added to the island province's ride-hailing network in 2020 must be NEVs, while it also required NEVs to make up at least 90% of new purchases or replacement purchases of buses.



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[Forecast & Analysis Highlights] NIO's revenue and vehicle margin improve during 2021 on strong vehicle deliveries

IHS Markit perspective

Implications NIO's vehicle deliveries doubled during 2021 to more than 91,400 units thanks to solid performance of its ES-series, which, at the moment, is a pure SUV product line. The automaker's showroom will be further diversified this year with the arrival of two all-new electric sedans, the ET7 and ET5, and a large electric SUV, the ES7.

Outlook Adding three new models in one year is a pace that has not been seen among traditional automakers in recent years. For NIO, these new models will play a major role in deepening its footing in the EV space and advance its pace to achieve greater economy of scale.



Chinese electric vehicle (EV) maker NIO has announced its unaudited financial results for fourth-quarter and full-year 2021. The company's total revenues stood at CNY9.9 billion during the October–December 2021 quarter, an increase of 49.1% year on year (y/y) and 1% quarter on quarter (q/q). Vehicle sales were CNY9.215 billion in the fourth quarter of 2021, up by 49.3% y/y and up by 6.7% q/q. The company's vehicle margin was 20.9% in the fourth quarter of 2021, compared with 17.2% in the same quarter of 2020 and 18.0% in the third quarter of 2021. NIO recorded a gross profit of CNY1.7 billion in the fourth quarter of 2021, up by 48.8% y/y and down by 14.7% q/q. In the fourth quarter of 2021, the company reported a net loss of CNY2.143 billion, an increase of 54.4% y/y and an increase of 156.5% q/q. Cash and cash equivalents, restricted cash, and short-term investment had amounted to CNY55.4 billion as of 31 December 2021. For full-year 2021, NIO's total revenues reached CNY36.14 billion, up by 122.3% y/y, and its gross profit was CNY6.82 billion, up by 264.1% y/y. Vehicle margin for full-year 2021 was 20.1%, compared with 17.2% for the previous year. The company recorded a net loss of CNY4.017 billion for full-year 2021, a decrease of 24.3% y/y.

As for vehicle deliveries, NIO delivered 25,034 vehicles in the fourth quarter of 2021, comprising 5,683 units of the ES8, 12,180 units of the ES6, and 7,171 units of the EC6. Cumulative deliveries in 2021 were 91,429 units, an increase of 109% y/y from 2020.

NIO chairman and CEO William Li said, "2021 had been a year of making decisive investments in products and technologies, as well as in power and service infrastructures. It had also been a year of elevated operations in fast iteration, supply chain response and innovation, production capacity expansion and systematic quality management to make comprehensive preparations for our development in the next phase. On top of our growing user base in China, 2021 also marked the beginning of our global market expansion starting from the launch and deliveries of NIO vehicles in Norway in September 2021." In the first quarter of 2022, NIO said that it expects its vehicle deliveries to total between 25,000 and 26,000 units. The company expects total revenues of CNY9.631 billion–CNY9.987 billion in the first quarter of 2022, up by 20.6%–25.1% y/y.



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NIO vehicle deliveries

	Q4 2021	Q3 2021	Q2 2021	Q1 2021
Deliveries	25,034	24,439	21,896	20,060

Source: NIO© 2022 IHS Markit now a part of S&P Global

NIO financial performance

	Q4 2021	Q4 2020	Y/Y % change
Vehicle sales (CNY mil.)	9,215.4	6,174.0	49.3
Total revenues (CNY mil.)	9,900.7	6,641.1	49.1
Net loss (CNY mil.)	-2,143.4	-1,388.6	54.4

Source: NIO© 2022 IHS Markit now a part of S&P Global

Outlook and implications

NIO's vehicle deliveries doubled during 2021 to more than 91,400 units thanks to solid performance of its ES-series, which, at the moment, is a pure sport utility vehicle (SUV) product line. The automaker's showroom will be further diversified this year with the arrival of two all-new electric sedans, the ET7 and ET5, and a large electric SUV, the ES7. Adding three new models in one year is a pace that has not been seen among traditional automakers in recent years. For NIO, these new models will play a major role in deepening its footing in the EV space and advance its pace to achieve greater economy of scale.

Despite supply chain challenges and rising raw material cost, NIO said that is still on track to stick with its original delivery targets for new models. Production of this flagship electric sedan has already begun at the JAC-NIO Hefei plant and the first batch of the ET7 will be delivered to its customers on 28 March. Compared with the ET7, the ET5, which is expected to begin delivery in September, is more likely to become a high-volume model for NIO as the model is positioned in the same segment as the Tesla Model 3 and certainly offers a good value for money at its current pre-sales price of CNY328,000.

During 2021, NIO also saw an increase in the average selling price of its vehicles, which has contributed to its margin improvement from 12.7% in 2020 to 20.1% in 2021. The higher take rate of the 100-kWh battery on the ES-series electric SUVs was cited as the reason behind the higher average selling price. For the full year 2022, NIO sets its gross margin to between 18% and 20%. The target has already factored in rising costs of EV batteries and the ongoing semiconductor shortages.



[Forecast & Analysis Highlights] Xpeng's revenue doubles in Q4, sets new record in full-year 2021

IHS Markit perspective

Implications	Xpeng's total revenues reached over CNY20 billion for the first time in the company's history, up 260% y/y.
Outlook	Xpeng's fourth-quarter financial report suggested around CNY4.1 billion in its expenses was earmarked for R&D-related activities, accounting for nearly 20% of Xpeng's total revenues for 2021. This is a clear sign that the company intends to develop a competitive edge in the field of smart EVs.



Chinese electric vehicle (EV)-maker Xpeng has announced its financial results for the fourth quarter and full-year 2021. The company's total revenues were CNY8.56 billion (USD1.34 billion) in the fourth quarter, up 200.1% year on year (y/y) and 49.6% quarter on quarter (q/q). Xpeng's revenues from vehicle sales were CNY8.19 billion in the fourth quarter, an increase of 199.3% y/y and 49.9% q/q. In the fourth quarter, Xpeng's gross margin stood at 12.0%, compared with 7.4% in the same period of 2020 and 14.4% in the third quarter of 2021. The company's vehicle margin was 10.9% in the fourth quarter, compared with 6.8% in the corresponding period of 2020 and 13.6% in the third quarter of 2021. Its net loss was CNY1.287 billion in the fourth quarter, compared with CNY787.4 million during the same period of 2020. Cash and cash equivalents, restricted cash, short-term deposits, short-term investments, and long-term deposits amounted to CNY43.54 billion as of 31 December 2021.

For the full-year 2021, Xpeng's revenues from vehicle sales were CNY20.04 billion, up 261.3% for 2020. Gross margin was 12.5% for the full-year 2021, compared with 4.6% for 2020. Vehicle margin stood at 11.5%, compared with 3.5% for the prior year. The company's net loss reached CNY4.86 billion for 2021, compared with CNY2.73 billion for 2020. Vehicle deliveries in the fourth quarter were 41,751 units, with P7 deliveries totalling 21,342 units. For the first quarter of 2022, Xpeng expects its vehicle deliveries to be between 33,500 and 34,000 units. Total revenues are expected to reach between CNY7.2 billion and CNY7.3 billion.

Outlook and implications

Xpeng's total revenues reached over CNY20 billion in 2021 for the first time in the company's history, up 260% y/y. The surge in total revenues is apparently driven by higher vehicle sales of its three models, the P7, P5 and G3. The company's gross margin and vehicle margin jumped to 12.5% and 11.5% respectively for the full-year 2021 from single-digit percentage points as its revenue increased. However, there is still room for Xpeng to continue to improve its margin performance during 2022 to close the gap with NIO, which managed to bring its gross margin to 18.9% and vehicle margin to 20.1% for the full-year 2021. Looking into 2022, Xpeng will continue to focus on production ramp-up for the P7, its highest-selling model in the market. Supply chain issues, especially



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tight semiconductor supply and rising raw material costs, will remain constraints in the company's efforts to ramp up vehicle deliveries in 2022.

Xpeng's fourth-quarter financial report suggested around CNY4.1 billion in its expenses was earmarked for research and development (R&D)-related activities, accounting for nearly 20% of Xpeng's total revenues for 2021. This is a clear sign that the company intends to develop a competitive edge in the field of smart EVs. The development of Xpeng's advanced driver assistance system (ADAS), the XPilot 4.0, is set to accelerate under the company's intensified push for a leading role in intelligent vehicle technologies. Xpeng's the G9 electric SUV will go on sale in the third quarter of 2021, and this flagship model will be the first in Xpeng's line-up to feature the XPilot 4.0 system. The release of the system on the G9, however, will only begin in 2023.



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[Supplier Highlights] Cisco, Verizon partner to demonstrate autonomous solutions using MEC technology in US

Test proves the potential removal of RSUs



Source: Getty Images/4X-image

Verizon has announced a collaboration with Cisco to demonstrate a successful proof of concept using cellular and mobile edge compute (MEC) technology for autonomous driving solutions without using physical Roadside Units to extend radio signals, a company press release on 29 March read.

This will enable government authorities and private operators create safer roads with C-V2X applications such as pedestrian protection, emergency, and transit vehicle pre-emption, on and off-ramp protection and safety at intersections with traffic signals.

“This test is a huge milestone in proving that the future of connectivity for IoT applications can be powered by cellular. We’re marking the strength of mobile edge compute platforms for connected transportation innovation with much more streamlined architecture. Together with Cisco technologies, we’re setting the foundation potentially to realize a ubiquitous IoT in the connected and autonomous future of driving,” said Krishna Iyer, director of Systems Architecture, Verizon.

Outlook and implications

The success of the test could potentially reduce the dependency on expensive hardware like roadside units (RSUs), which are also more difficult to upgrade compared to software solutions. It shows that connected and autonomous vehicle applications can be deployed using LTE networks, mobile edge compute, and in-vehicle interfaces. This, in essence, could result in safer roads with less congestion. Verizon has been working on MEC solutions for a while.

In January 2021, Verizon announced that its 5G mobile edge computing platform in partnership with Amazon Web Services (AWS) would be available in Denver and Seattle in the United States and in April later that year, Verizon partnered with Honda to test vehicles with connected safety technologies at University of Michigan's Mcity test bed. The two companies worked on connected safety technologies using 5G and mobile edge computing to allow for fast and reliable communication between road infrastructure, vehicles, and pedestrians.



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[Supplier Highlights] Luokung Technology acquires big data company Beijing Hongda Jiutong in China

Acquisition will enhance V2X technology for various modes of transportation



Source: Getty Images Plus/ metamorworks

Luokung Technology, a leading Spatial-Temporal intelligent big data services company and provider of interactive location-based services and High Definition (HD) maps in China, announced the signing of an agreement to acquire Beijing Zhong Chuan Shi Xun Technology Limited, according to a press release published by Luokung on 29 March.

The collaboration will strengthen data management system by leveraging on Hongda Jiutong's technological capabilities and Luokung's spatial-temporal big data processing and analysis.

Dr. Chuanjiu Wang, CEO, Hongda Jiutong, said "We are very pleased to be a part of Luokung's Smart Transportation business. We are confident that our deep expertise in road condition information and vehicle-end underlying data will support Luokung in optimizing its V2X system and accelerate the implementation of V2X-based autonomous driving in various modes of transportation. Combined with Luokung's digital base and spatial-temporal big data engine, Hongda Jiutong intends to work closely with Luokung to provide diversified services related to underlying spatial-temporal big data to its partners and end users in the fields of autonomous driving, assisted driving and intelligent transportation."

Outlook and implications

Vehicle-to-everything (V2X) is one of the key steps to bring in the autonomous ecosystem. V2X allows cars to connect and exchange data with other vehicles, infrastructure, and pedestrians so that it is aware of its surroundings. The V2X system not only trigger warning alerts but also communicate with traffic signals for a smooth and efficient driving experience.



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[VIP ASSET] Fuel For Thought - Can the dealer of today serve the EV customer of tomorrow?

The jury is no longer out. Electric vehicles (EVs) are coming, and in large numbers. We have heard the message loud and clear. Nearly every major automaker in the United States has announced significant investment commitments to transition a substantial percentage of their product portfolio from internal combustion engines (ICEs) to EVs.

- The number of available EV models in the US is expected to increase 10 times over, from 26 in 2021 to 276 in 2030
- The adoption of these offerings is also expected to be widespread
- California's share of EV sales in the United States is projected to decline from 35% in 2021 to only 12% in 2030
- Tesla's share of EV sales will decline from 71% in 2021 to only 10% in 2030

To support this EV expansion, governments, companies, and EV consumers will be required to invest considerably to build out charging infrastructure, with the number of charging stations increasing from 850,000 in 2021 to nearly 12 million by 2030.



But what will this transition mean for the average US franchised dealer? What changes will be required to the traditional sales process? Will service revenue be at risk? What investments will be required? The pace of transition will differ dramatically across brands, but the challenges and opportunities will be similar. The brands and dealers that can create a simplified, customer-centric approach through this transition will create a key differentiator during this retail transformation.

The average franchise dealer will be tasked to sell, service, and manage relationships with a traditional ICE vehicle customer base, at the same time, trying to aggressively grow the EV business. Even with the dramatic growth expectations for EVs, the average dealer in 2030 will have a new vehicle sales mix of 70% of ICE vs. 30% EV. On the service side, more than 80% of vehicles in operation (VIO) will still be ICE vehicles. The prolonged dominance of ICE vehicles will translate to hesitation from dealers to shift their substantial resources to support EV growth. Sales manager compensation will continue to be dominated by selling the traditional ICE vehicle inventory. Service lanes and workshop processes will continue to be organized around ICE vehicle maintenance and repair requirements. The challenge will be to maintain these core business operations while also laying the groundwork for the transition to EVs and an evolving business model.

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[VIP ASSET] Expansionary Policies Provide a Tailwind to Mainland Chinese Truck Market, but Challenges Remain

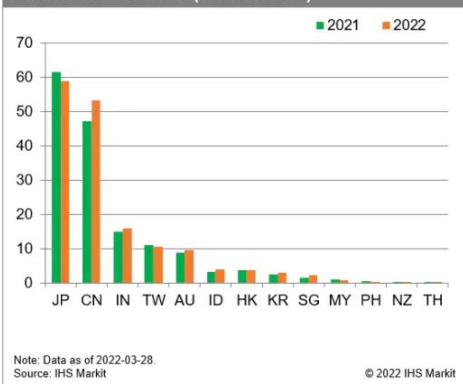
The pre-loaded consumption and supply chain disruptions have clouded the mainland Chinese medium- and heavy-duty truck (MHDT) market since last summer. With gradual easing of power shortages and recent injection of policy stimulus, production of MHDT saw narrowed contraction from November 2021 and will accelerate restoration in 2022. In our February forecast, we improved the mainland Chinese MHDT production for 2022 by 5% to 1.18 million units, still a decline of 19% compared with 2021.



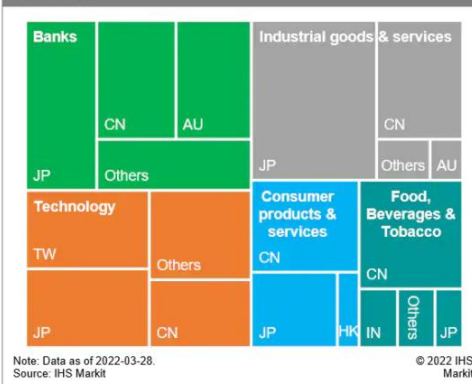
Expanding fiscal spending adds to new demand

To counter mounting economic growth headwinds, fiscal measures have been shifted from de-risking to stimulative since the fourth quarter of last year. According to the 2022 government work report, the tax rebate and cut packages for households, small- and medium-sized businesses, as well as industries such as manufacturing, services, and transportation are extended from CNY1 trillion in 2021 to CNY2.5 trillion in 2022. In the transportation sector, preferential highway tolling and incentives for logistics will continue to be a part of the scheme, facilitating trucking recovery to the pre-pandemic norm. In addition, local governments' borrowing, the main source of infrastructure investment, could reach CNY4.14 trillion under loosened oversight and early issuance of special-purpose bonds. Coupled with CNY640 billion of central budget for major construction projects, these will allow a healthy growth of infrastructure investment in 2022. Concurrently, the real estate investment will be accelerated by the ongoing relaxation of restrictions on the housing market, reflected in consecutive reduction of mortgage rates and increase of city-level supports to shore up purchases. Construction truck demand is therefore expected to go up by 4-6% in 2022 from a 1% expansion in 2021, adding around 15,000 units to the February outlook.

Market breakdown of aggregate dividend to be announced in 2022 Q2 (in USD billion)



Sector breakdown of aggregate dividend to be announced in 2022 Q2



Fine-tuned environmental policies accelerate replacements



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The strict implementation of the "Dual Control" of energy consumption amount and intensity across energy-intensive industries in 2021 that has greatly aggravated power shortages and curbed industrial output is eased in 2022 to stabilize industrial growth. The goal of "Dual Control" policy, turned focus on reduction of carbon emission. Existing restrictions on annual energy expenditure of industrial enterprises will be removed, and some of them will be subsidized with green loans. Meanwhile, the decarbonization agenda for industries such as steel is adjusted to be less aggressive, with the deadline of peaking carbon emission being postponed by five years to 2030. In contrast, downstream regulations on diesel trucks become stringent. After forcing out around 1.3 million units CN1-3-level trucks in key regions by 2021, the State Council vows to basically phase out all below-CN4-level trucks across the nation by 2025. In particular, Shandong Province, which claims to have completed elimination of CN3-level trucks, will start to clean CN4-level trucks from this year. Moreover, for applications such as transport of bulk commodities, municipal construction, and sanitation, CN5-level trucks are ordered to be upgraded or electrified in some regions during 2022-25. Considering our previous assumptions on continued clearance of CN1-3-level trucks, the new policies are estimated to bring about 50,000 units more truck replacements to 2022.

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