Paths and Suggestions for Advancing China-ASEAN Cooperation in Emerging Industries

China EV100 中国电动汽车百人会

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Abstract

Against the backdrop of global industrial transformation and green development, emerging industries represented by the digital economy, new energy, electric vehicles (EVs), semiconductors, and high-end equipment are growing into the growth drivers of China-ASEAN trade cooperation as well as the focus of industrial transformation and upgrading in the future. Faced with profound changes in the global political and economic landscape, industrial chains and value chains are also undergoing profound changes due to anti-globalization and protectionism. To achieve win-win development in this context, it is crucial for China and ASEAN to assess the foundation and potential for cooperation in emerging industries, identify latent risks and problems in advance, and develop sound strategies and paths for long-term cooperation.

This report delves into the significance and potential of China-ASEAN cooperation in emerging industries, analyzing the development foundation of emerging industries in ASEAN as well as the current status, trend, and direction of bilateral cooperation. It also presents key directions for propelling such cooperation under the new circumstances, along with policy recommendations. The main conclusions are as follows.

With rich resources, strong impetus, great potential, and a generally rosy outlook, the emerging industries in ASEAN countries are structurally complementary to those in China. This has laid a solid groundwork for thriving bilateral cooperation featuring diversified models. Such extensive and pragmatic cooperation will be hugely consequential to the prosperous

and stable regional trade and green transition. Going forward, we are committed to long-term strategic cooperation focusing on new energy, EVs and upstream materials, semiconductors and high-end equipment, and the digital economy. Taking full account of the development bases and aspirations of all countries, we will diversify into more cooperation models to achieve win-win results.

Given the overall situation of the cooperation in emerging industry of China and ASEAN we will pursue the following priorities: first, further improving the China-ASEAN cooperation mechanism with a focus on emerging industries; second, promoting the China-ASEAN cooperation in emerging industries in innovative manners; third, establishing the financial, logistic and human resources support systems for the international cooperation in emerging industries between China and ASEAN; and fourth, pushing forward the exchange, harmonization, and cooperation on standards and regulations of China and ASEAN.

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I. Strengthening Cooperation in Emerging Industries Is of Strategic Importance for Win-Win Development Between China and ASEAN

China-ASEAN cooperation holds the key to a stable and prosperous regional economy. ASEAN, an important regional international organization in Asia, plays a vital role in regional affairs. Owing to geographical proximity, cultural affinity, and interconnected interests, China and ASEAN have carried out cooperation spanning economy and trade, tourism, culture, transportation, scientific research, and infrastructure under bilateral or multilateral cooperation mechanisms such as the Belt and Road Initiative (BRI), ASEAN Free Trade Area (AFTA), Lancang-Mekong Cooperation, the Regional Comprehensive Economic Partnership (RCEP), and ASEAN plus China (10+1). Today, ASEAN is steadily advancing its ASEAN Economic Community Blueprint 2025, which aims to accelerate digitalization, green and sustainable economic growth, and integration of regional and global markets. This is highly compatible with China's development philosophy and direction, such as the digital economy, dual carbon goals (i.e. carbon peaking and carbon neutrality), and high-level opening-up. Both China and ASEAN serve as major engines driving regional and global economy. Harmonized development directions and goals will effectively stimulate the endogenous momentum of cooperation between the two sides, which will be conducive to Asia's economic integration and the stable growth of the region and the world.

China-ASEAN political, economic, and trade cooperation has a strong footing and great potential. Since China and ASEAN launched the dialogue process in 1991, the two sides have gradually built a win-win and mutually trusting cooperative system through multi-

dimensional dialogues and trade cooperation. The establishment of the comprehensive strategic partnership between the two sides in November 2021 opened a new chapter of candid, in-depth, and pragmatic bilateral cooperation. Led by a stable political foundation, the trade volume between China and ASEAN has scaled up year by year to USD 926.55 billion in 2023, up 224% since the inception of AFTA in 2010, accounting for 15.5% of China's foreign trade, making ASEAN China's largest trading partner for four consecutive years. Overall, there has been an encouraging trend in the China-ASEAN trade index, quality, closeness, and vitality. In terms of investment, China has signed bilateral investment agreements with 10 ASEAN countries. As of July 2023, the cumulative two-way investment between China and ASEAN has exceeded USD 380 billion, with a total of more than 6,500 direct investment enterprises set up by China in ASEAN. On the whole, China and ASEAN have developed an exemplary cooperation pattern in the Asia-Pacific region, characterized by entwined interests and interdependence. Both sides have achieved win-win results through complementary edges in investment and trade cooperation. This not only contributes to the growth of the national economy and enterprises, but also lays a good groundwork for deeper cooperation in the future.

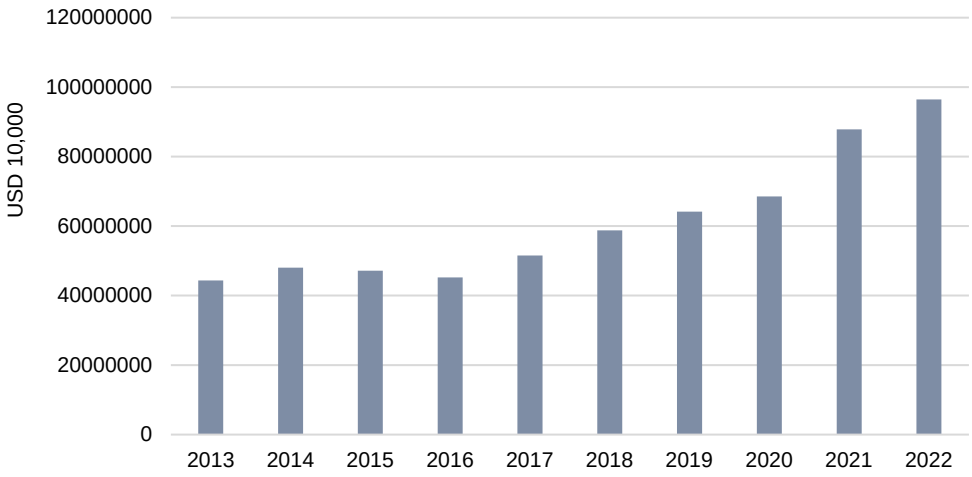

Figure 1 China-ASEAN Trade Volume

Source: General Administration of Customs (GACC), compiled by EV100plus

Intensifying cooperation has become a realistic path for both sides to deeply integrate into the global industrial system and address changes in the international situation. Today, dramatic shifts are taking place in global industrial chains and value chains due to anti-globalization and protectionism. Its manufacturing sector is likely to be trapped in low-end lock-in and the share of exports to traditional destinations such as Europe and the U.S. may decline if it continues the attempt to embed itself in the current global value chain system. Highly export-dependent, major ASEAN countries like Singapore, Vietnam, and Malaysia, whose exports account for more than 80% of their GDP, are likely at risk of a sharply shrinking export market triggered by sluggish external demand and protectionism. Overall, China and ASEAN have worked together to adjust the mode of division of labor in the region while deepening cooperation in a wider range of areas in the face of common external pressures and respective industrial development aspirations. This not only underpins a larger market and industrial scale and socio-economic progress for both sides, but also helps build the region's value chains and elevate both sides' status of division of labor in the global value chain.

Deepening China-ASEAN cooperation in emerging industries has become a significant direction for industrial upgrading and green transition. Being high value-added, high-growth, and technology-intensive, emerging industries are seen as a vital means to propel China's technological progress and industrial transformation, with sound and modern industrial systems established in such fields as digital economy, high-end equipment, photovoltaics (PV), and new energy vehicles (NEVs). Statistics reveal that over 10% of China's GDP comes from the added value of emerging industries, including next-generation information technology, high-end equipment, and NEVs. A number of advanced manufacturing and emerging industry clusters with global influence have been developed. Key components of clean energy equipment, such as PV modules and wind turbines, hold 70% of the global market share, while sales of NEVs exceed 60% of the global total. ASEAN, as an emerging manufacturing base and a place

to absorb global industrial transfer, also regards emerging industries as a key area to promote economic growth and competitiveness. Both sides are mutually reinforcing in terms of capacity and factors like technology, industry, and market of emerging industries. At this critical time, as global industries move into a green, low-carbon, and high-tech era, strengthening cooperation in emerging industries will become an essential direction. This leads to a more quality and effective trade pattern, as well as high-quality and sustainable development of the industries in China and ASEAN.

II. Foundation for the Development of China-ASEAN Cooperation in Emerging Industries

(i) Strong Momentum and Bright Future for Emerging Industries in ASEAN Countries

1. Aspiration: Emerging industries become key drivers for economic growth and industrial transformation in ASEAN countries

To be more economically competitive and achieve more comprehensive and balanced economic growth, ASEAN countries have devised various policies and programs to boost emerging industries based on their respective strengths and foundations. However, as the socio-economic progress varies from country to country, according to their resource strengths, development levels, and aspirations can be broken down into three categories.

Category I. Singapore, for example, is a country superior in industrial footing, economic growth, and per capita income, but short of resources. Developing emerging industries enables economic diversity that helps cement its industrial strengths and global influence. Singapore is a global leader in the digital economy, which contributed 17.3% to its GDP in 2022 and created 200,000 jobs in the technology sector. Its recently updated *National AI Strategy 2.0* proposes to key points to empower the construction of a smart nation with artificial intelligence and remain number one in ASEAN in terms of high-tech emerging industries such as fintech, information and communications technology (ICT), biomedicine, and high-end manufacturing.

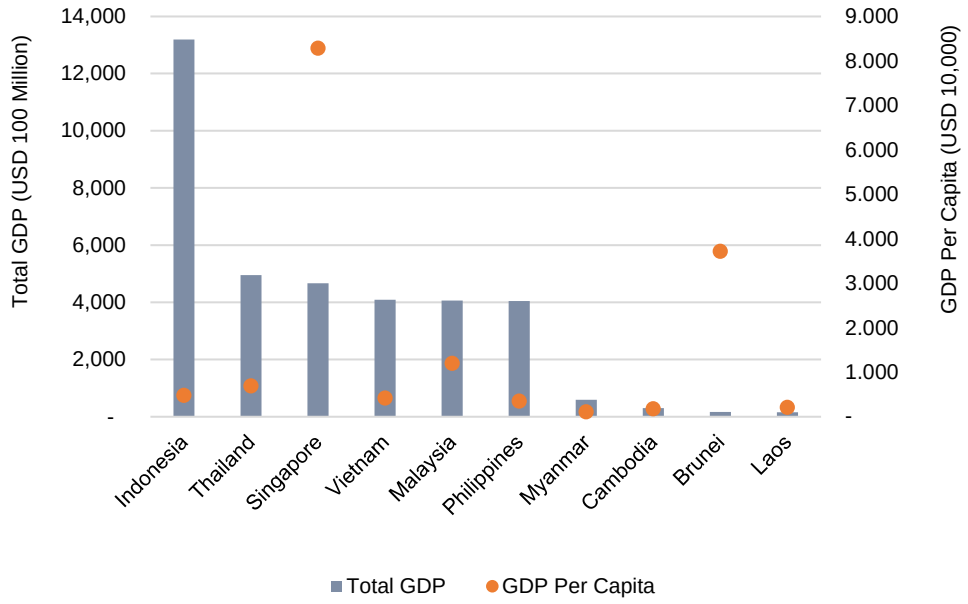

Figure 2 ASEAN Countries' Total GDP and GDP Per Capita in 2022

Source: World Bank, compiled by EV100plus

Category II. Countries such as Thailand, Indonesia, and Brunei are shifting from mono-structural growth, heavily reliant on traditional agriculture and resources, to growth with more diversified industrial structures. These countries possess a certain level of industrial base but need to transition to higher value-added and technology-intensive industries for sustainable economic development. In recent years, the value chains of global emerging industries, such as EVs and semiconductors, have moved or are poised to move to countries like Thailand, Malaysia, and Indonesia. The development speed of emerging industries will further accelerate in the future.

Category III. Countries like Cambodia and Laos hold immense room for economic progress, pending the removal of such obstacles as shortage of infrastructure and human resources. Relying on agriculture, food, tourism, export of raw materials, and low-end industries as their main economic sources, they have a weak foundation in emerging industries and need unified planning. The industrial transformation, however, is far from easy. In light of the high population growth rate and a large proportion of young people in

these countries, the development of emerging industries means more job opportunities, better infrastructure, more efficient public services, a better quality of life for their people, and new growth drivers.

2. Priorities: New energy, EVs, and digital economy emerge as significant directions of emerging industries in ASEAN

As the global economy and industries accelerate toward greener, lower-carbon, and more intelligent development, ASEAN countries have set low-carbon development goals and reached a series of consensus and investment plans at the regional level based on their respective strengths in renewable resources, biodiversity, and manufacturing advantages. This aims to jointly advance areas like new energy, EVs, digital economy, and high-end manufacturing, making them crucial directions to stimulate economic growth, technological advancement, and new international competitiveness in the region.

Table 1 Timetable of Carbon Peaking and Carbon Neutrality Commitments by ASEAN Countries

Country	Carbon Peaking	Carbon Neutrality
Singapore	2030	50% reduction by 2050, and achieve carbon neutrality as soon as possible in the second half of the 20th century
Thailand	25% reduction from BAU by 2030	2050
Indonesia	2030	2060
Malaysia	45% reduction in carbon emissions intensity by 2030 from 2005 baseline	2050
Philippines	2030	
Vietnam	9% reduction from BAU by 2030	2050
Laos	60% reduction from BAU by 2030	2050
Cambodia	41.7% reduction from BAU by 2030	2050
Myanmar		2050

Source: Public information, compiled by EV100plus

In the field of new energy, industries like PV power and wind power are gaining rapid growth in ASEAN based on local resource strengths and demand. With abundant reserves of renewable energy resources such as solar energy, geothermal energy, wind energy, hydropower, and biomass, the 33rd ASEAN Ministers on Energy Meeting in 2015 specified an explicit target for renewables (excluding traditional biomass) to account for 23% of the total primary energy consumption and 35% of the total amount of installed capacity in ASEAN by 2025. Although renewable energy remains underexploited in ASEAN countries, the total amount of renewables in Vietnam, Thailand, Indonesia, Laos, and the Philippines is growing steadily, according to IRENA data. Meanwhile, the per capita availability of renewables in ASEAN is inadequate and varies widely across countries. At present, major ASEAN countries are catalyzing new energy development through stronger incentives and the model combining independent development and international cooperation, which is expected to spur rapid growth of total renewables and per capita resources across the region.

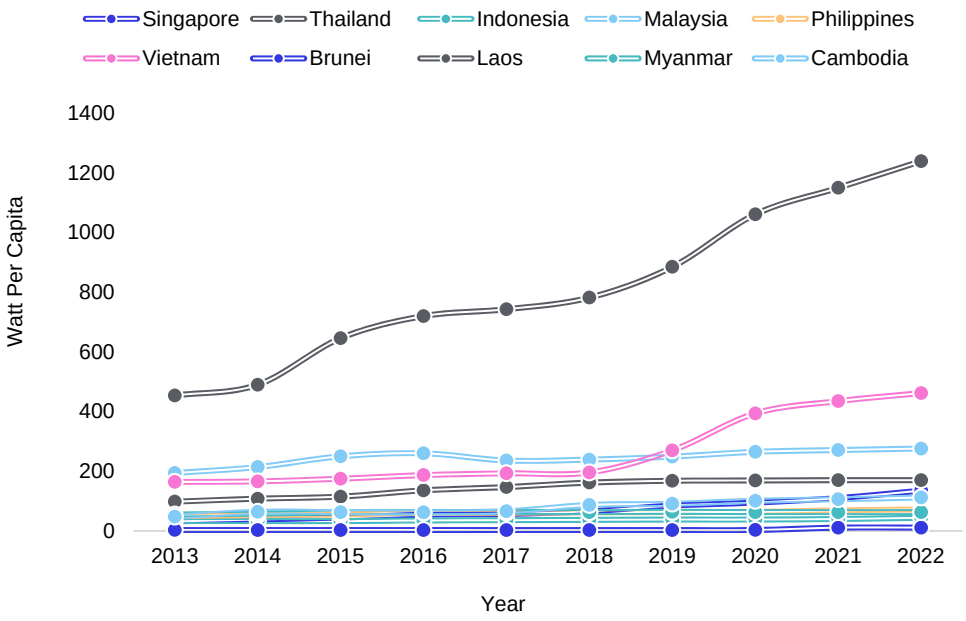

Figure 3 Total Renewables (Capacity) in ASEAN Countries

Source: Renewable Energy Statistics 2023, IRENA, compiled by EV100plus

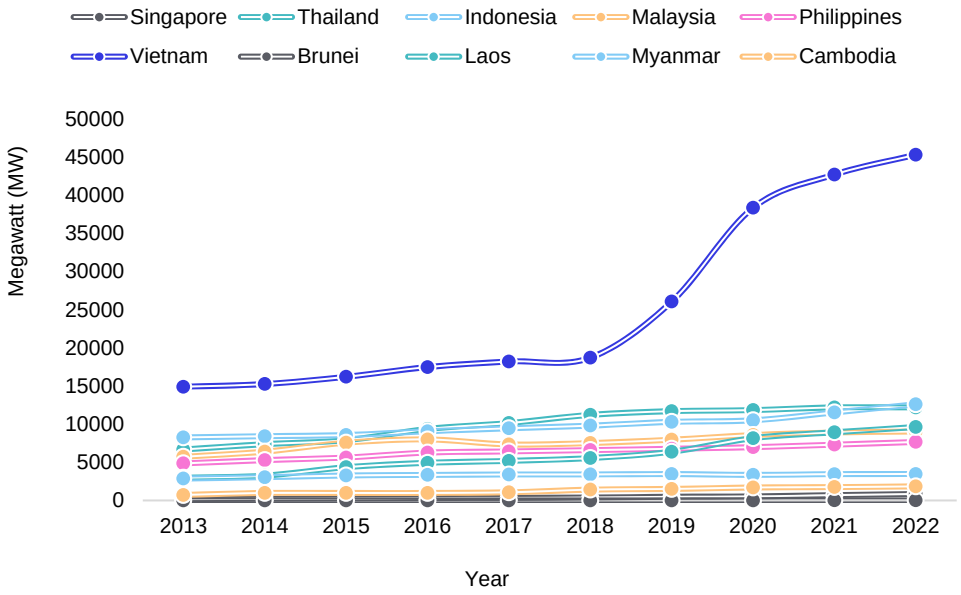

Figure 4 Per Capita Installed Capacity of Renewables in ASEAN Countries

Source: Renewable Energy Statistics 2023, IRENA, compiled by EV100plus

In Thailand, Malaysia, Vietnam, and the Philippines, there has been a rapid promotion and widespread adoption of PV power generation. To reduce fossil fuel consumption, Singapore anticipates a total of 2,000 megawatts (MW) of power generation from PV panels on urban rooftops by 2030, with distributed PV panels installed on large reservoirs to power water plants. To be less reliant on coal-fired power, the Philippines passed Resolution 761 in June 2020 to ban new coal-fired power plants while encouraging industrial integration, such as allocating USD 700 million to build a PV agricultural system capable of irrigating 57,000 hectares of rice paddies. Given the rapid urbanization and population growth in ASEAN countries, it is imperative to address the mismatch between areas rich in natural renewable resources and those with high energy demand, and increase the share of renewables while ensuring energy supply.

In the semiconductors and high-end equipment sectors, ASEAN countries have established a solid base with varying focuses. Singapore looks at the back-end industries of the value chain, encompassing robotics and semiconductors. It places a particular

emphasis on developing environmental robots capable of public sanitation and pollution control. A comprehensive semiconductor industrial chain, spanning from IC design to manufacturing, packaging, and testing, has also been established. Industry giants including Infineon, MediaTek, and Micron have set up their plants and Asia-Pacific headquarters in Singapore. In addition, great government support has been provided for chip research and development (R&D) to meet the growing demand for gallium nitride (GaN) chips, along with a planned investment of USD 85 million from 2021 to 2026 to establish a GaN research center. On the other hand, the semiconductor industries in Malaysia, Thailand, Vietnam, and the Philippines are largely in the labor-intensive contract manufacturing phase, making these countries the destinations for large-scale industrial transfers by internationally renowned companies over the past three years. The influx of foreign capital and technology has brought about more sophisticated electronic component and equipment industries. Malaysia, for example, boasts back-end industries that hold great significance in ASEAN. Statista data shows that Southeast Asia as a whole accounts for 27% of the world's packaging and testing market share, with Malaysia contributing up to half of this share. Malaysia will strive to enhance both the front-end and back-end of the semiconductor value chain. Approval has been granted for a new USD 20.34 billion investment program for multinational microelectronics companies, aiming to promote various aspects of high-end semiconductor manufacturing, such as IC and packaging design, embedded system design and testing, and engineering design.

EVs continue to boom in ASEAN countries, where automobiles and their industry chains are experiencing robust growth. With reasonably solid foundations and manufacturing systems in automotive industry, there is tremendous potential for development in countries like Thailand, Indonesia, Malaysia, the Philippines, and Vietnam. Thailand has established a relatively sound NEV industrial chain by taking advantage of its automotive industrial chain and labor accumulation. It aims for NEVs to constitute 15% of total automobile

production by 2025, 30% by 2030, and 100% by 2035, gradually enhancing the localized production capacity and industrial scale. Rich in nickel and other mineral resources, Indonesia and Malaysia are concentrating on upstream industries such as power battery energy storage devices, parts, and charging posts for EVs. Vietnam is also accelerating its presence in the EV value chain. It plans to include EV manufacturing and assembly, and battery production, among others, in the list of special investment incentives to attract domestic and foreign investment in the EV industry. Countries like Cambodia and Laos are accelerating the construction of charging infrastructure to create a more conducive environment for EV adoption. According to predicted from relevant institution that ASEAN's EV market size will surge from USD 860 million in 2023 to USD 3.54 billion in 2028, with a compound annual growth rate (CAGR) of 32.7%.

New materials, particularly mineral ones, have seen constant innovation and breakthroughs in many countries thanks to their advantages of reserves. Countries such as Indonesia and Thailand are working on power batteries and key materials like semiconductors with their rich resources like tin, nickel, and copper. Indonesia, as one of the world's largest nickel producers, is developing nickel-based materials for lithium batteries. It has also teamed up with international companies to build lithium battery factories, aiming to create a complete battery production chain from mineral extraction to battery manufacturing, thereby boosting the local battery manufacturing industry. Thailand's substantial reserves and processing capacity of minerals such as copper and tin provide a secure supply of raw materials for its semiconductor industry. Cutting-edge technologies have also been introduced to facilitate the R&D and production of high-performance semiconductor wafers. Vietnam, abounding with rare earth element resources, is developing rare earth materials for electronic products. Malaysia is tapping into its aluminum resources to develop lightweight materials essential for aerospace and automotive manufacturing. Overall, ASEAN countries are giving full play to their mineral riches to drive technological innovation and development of

the new materials sector, which will help foster new growth drivers and enhance their international competitiveness.

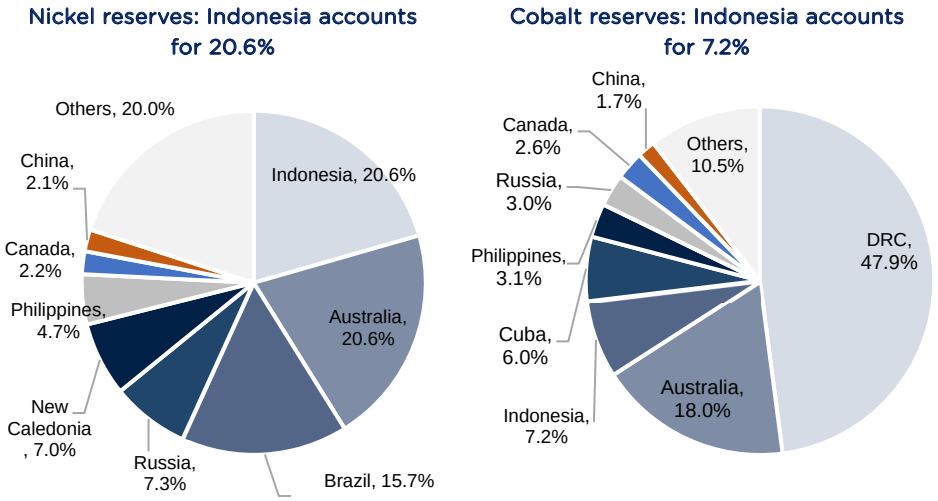

Figure 5 Distribution of Global Nickel and Cobalt Reserves

Source: U.S. Geological Survey (USGS), compiled by EV100plus

In terms of the digital economy, ASEAN countries are ramping up next-generation information technology and digitalization to drive the digital industrial revolution. In recent years, mobile Internet has been on the fast track while digital infrastructure remains backward in ASEAN. Accordingly, ASEAN prioritizes ICT development, and all member states upgrade information technology based on their respective footings and develop digital industries to prompt the growth of the digital economy. On the one hand, countries like Myanmar, Cambodia, and Laos that lack information technology and government funding, will give priority to developing sound digital infrastructure and digital information systems, universalizing high-speed 4G networks, reserving ICT talents, and introducing policies to attract foreign investment and technology. On the other hand, those with comparatively sound infrastructure and advanced information technology, such as Singapore, Thailand, Malaysia, and Vietnam, will invest in high-value digital industries, including 5G, artificial intelligence (AI), big data centers, and the Internet of Things (IoT). The Thai government, for instance, envisions a relevant investment of USD

700 million by 2026, with an annual growth rate of 8%.

ASEAN countries have different focuses when it comes to developing the digital economy. Singapore aims to transform a smart nation by pursuing three strategic transitions: digital government, digital economy, and digital society. Malaysia, Vietnam, Indonesia, and the Philippines put a premium on the development of e-commerce, which ranked among the top ten globally in terms of growth in 2022 and holds promising prospects. Among them, Malaysia encourages 875,000 micro, small, and medium-sized enterprises (MSMEs) to use e-commerce, with the goal of the digital economy contributing 22.6% of its GDP and creating 500,000 jobs by 2025; Vietnam expects its e-commerce scale to reach USD 49 billion by 2025, claiming the top spot in ASEAN.

3. Measures: ASEAN countries promote emerging industries through methods as top-level planning, fiscal & tax subsidies, and demonstration and pilot projects

The measures to promote emerging industries diversify and vary across ASEAN countries. Singapore, the Philippines, Thailand, Indonesia, and Malaysia adopt a diverse range of measures, including policy incentives, government funding and subsidies, demonstration projects, tax incentives, and infrastructure development incentives, to attract domestic and international talent, funds, and technology into targeted emerging industries. In contrast, Vietnam, Brunei, Laos, Myanmar, and Cambodia have a relatively small number of measures to attract emerging industries, mainly focusing on policy incentives, as the environment for emerging industry development needs further improvements while local industries are not attractive enough for development.

Taking Thailand's measures to develop the NEV industry as an example, the country has positioned itself as an NEV production hub for the ASEAN region since 2015 and sets a 50% EV production target by 2030, given that it lacks advantages over oil and mineral resources.

In terms of industrial policies, Thailand has planned and implemented infrastructure construction projects (like building charging posts), preferential policies, and large-scale funding subsidies. It has stepped up consumption subsidies for new battery electric vehicles (BEVs) and cut import and excise taxes on BEVs, motorcycles, and pickup trucks to promote the rapid adoption and popularization of EVs in Thailand.

In terms of localization system construction, Thailand emphasizes domestic EV production and supports local manufacturing. The government allows 100% foreign ownership in Thailand, provides the exemption of import duty on auto parts imported for use in local production, and implements phased income tax relief policies for producers settled in Thailand. This helps attract emerging EV makers worldwide and mature industrial chain suppliers to leverage Thailand as a production base for industrial transfer and expansion. With a competitive automotive industry base in the ASEAN region and explicit favorable policy support, Thailand has successfully entered the initial stage of industrial transformation from internal combustion engine vehicles (ICEs) to NEVs.

(ii) Sound Base and Diversified Modes of China-ASEAN Cooperation in Emerging Industries

1. Policy: Emerging industries reveal growing importance

Emerging sectors such as the digital economy, green economy, and clean energy have emerged as crucial development directions within the framework of China-ASEAN cooperation. On the one hand, both sides are exploring the potential for regional cooperation in emerging industries across product trading, infrastructure, investment, industrial chain co-construction, etc., as participants of the BRI, RCEP, the China-ASEAN Free Trade Area (CAFTA), and the China-ASEAN Comprehensive Strategic Partnership framework. For instance, the China-ASEAN Comprehensive Strategic Partnership Action Plan (2022-2025) explicates goals of creating more trade opportunities in digital economy and exploring green economy. On the other hand,

bilateral cooperation with individual ASEAN countries also highlights emerging industries. For instance, China and Vietnam have signed cooperation documents that cover multiple fields and stress further boosting investment and cooperation in emerging fields such as green development and digital economy. Moreover, China and Singapore have signed the *Memorandum of Understanding on Enhancing Cooperation in the Digital Economy*.

2. Economy and trade: Emerging industries stand as new growth drivers of trade between China and ASEAN

Industries like semiconductors, biopharmaceuticals, materials, automobiles, and PV have become new growth points and important components of China's exports to ASEAN. According to statistics, China's exports of goods in six major industrial categories to the seven ASEAN countries totaled USD 112.5 billion in 2023, with a growth rate of 27% over the past three years.

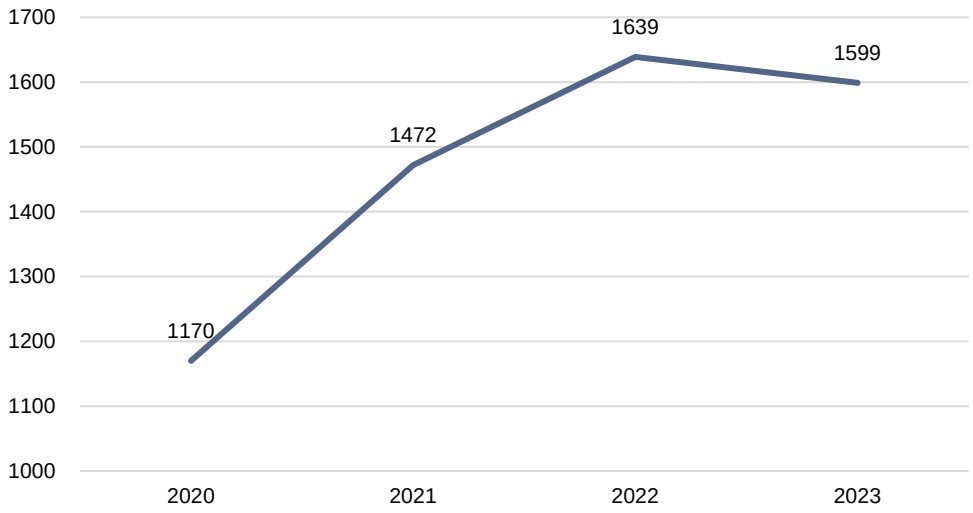

Figure 6 2020-2023 China's Exports of Goods in 6 Industrial Categories to 7 ASEAN Countries (in USD 100 Million)

Source: General Administration of Customs (GACC), compiled by EV100plus

From 2020 to 2023, China's exports of emerging industry goods to ASEAN showed an upward trend, with rapid growth in cross-border e-commerce B2B goods with the simplified declaration, optical and

medical instruments, transportation equipment (e.g., automobiles and aircraft), etc. Specifically, China's exports of representative goods from emerging industries to ASEAN showed an overall good momentum of development. The upward export trend is notably witnessed in new energy goods featuring PV panels with monocrystalline silicon slices and in electric passenger vehicles equipped solely with electric drive motors. Regarding the latter, particularly, China's exports to the seven ASEAN countries have achieved more than 15-fold growth overall. Regionally, countries like the Philippines and Malaysia saw rapid development in exports of semiconductors exemplified by integrated circuits and digital economy products. Vietnam, Thailand, and Malaysia collectively have a significant share in sectors like EVs and PV.

3. Cooperation model: China and ASEAN deepen and broaden cooperation in emerging industries through diversified models

The "Two Countries, Twin Parks" model has become a pivotal platform for capacity cooperation between China and ASEAN. Featuring two countries setting up industrial parks on each other's soil, this cooperation model effectively taps into the comparative advantages and potential of resources on both sides through industrial connectivity, mutual assistance in facilities, reciprocal policies, and collaborative development and sharing. The China-ASEAN "Two Countries, Twin Parks" model has yielded significant results. For instance, over 200 projects have been signed and settled in the China-Malaysia Qinzhou Industrial Park as of 2022, with a total investment of over RMB 190 billion, since the establishment of the China-Malaysia "Two Countries, Twin Parks" project over a decade ago. This model has also gradually been adopted in the development cooperation of emerging industries. In January 2023, the State Council approved the establishment of the China-Indonesia Economic and Trade Cooperation Innovation Demonstration Park. In August 2023, 28 projects with a total investment of RMB 16.667 billion commenced construction and production, including such emerging industry projects as the China-Indonesia Cross-border E-commerce Industrial Park and the Zhongchen Mining processing and production line of new

energy materials. The China-Philippines Economic and Trade Cooperation Innovation Demonstration Park also focuses on fostering emerging industries, proposing the development of five RMB 50-billion industry clusters in new energy, electronic information, green papermaking, pharmaceuticals and health, and digital services.

The investment in factory building and in-depth cooperation with local enterprises has rapidly taken root. With strong support from ASEAN countries, Chinese NEV and supply chain companies have ramped up localization efforts in ASEAN. For complete NEV manufacturing, Chinese automakers (e.g., SAIC, Geely, Hozon Auto, BYD, and GWM) have established manufacturing plants in Southeast Asian markets. For power batteries, CATL aims to build a complete power battery industrial chain in Indonesia through its subsidiary investment, which integrates mining, smelting, precursors, cathodes, and battery recycling. For infrastructure, Chinese automakers and charging post companies have initiated the charging network construction in ASEAN. For instance, GWM's first super charging post that integrates PV power generation, energy storage and charging was established in Bangkok, Thailand, with 24-hour charging and refueling services available to local users. For critical raw materials, Chinese new energy material companies (e.g., GEM, CATL, Chengxin Lithium Group, and Tsingshan Holding Group) are actively investing in factory building in Indonesia. For instance, Tsingshan Holding Group and Indonesia's Bintang Delapan Group have jointly developed the China-Indonesia Tsingshan Industrial Park projects, the first of which has achieved an annual production capacity of 300,000-ton ferronickel, with about 67% of Indonesia's ferronickel production from Tsingshan Holding Group.

The cooperation model integrating equity investment, EPC (engineering, procurement, and construction), and localized operation is going in full swing. Based on the traditional EPC model, only short-to-medium-term economic benefits can be achieved by Chinese overseas projects, as they only involve investment and operation, play main roles as construction or equipment providers, and

lack substantial management over projects. In the green energy and digital economy industries, the cooperation model integrating equity investment and EPC is gradually becoming a significant approach for Chinese companies' investment and cooperation overseas. This model covers various forms (e.g., equity investment, financial support, general engineering contracting, and equipment export), and demonstrates strong export-driven investment impetus and competitive strength, as it enables active participation in Southeast Asia's energy and power market construction and allows Chinese equipment, technology, and capital to penetrate overseas markets effectively. Chinese e-commerce platform companies have also successfully adapted to local markets by investment in or joint venture with local e-commerce platforms, laying a solid foundation for localized e-commerce operations. For example, Alibaba Group acquired a stake in Southeast Asian e-commerce player Lazada Group for USD one billion. The joint venture JD Central between JD.com and Central Group, the biggest retail conglomerate in Thailand, has become one of the most promising local comprehensive e-commerce platforms.

Cooperation in technology R&D continues to deepen in fields such as mobile communications and high-end equipment. China is accelerating cooperation in emerging mobile communication technologies in ASEAN countries. For example, ZTE has partnered with AIS (the largest mobile operator in Thailand) and the Suranaree University of Technology to build 5G-powered technology, smart factories and upgrade Thai manufacturing sectors through expanded 5G applications. Huawei has established the Thailand 5G Ecosystem Innovation Center, the first kind in ASEAN. China Aerospace Science and Technology Corporation (CASC) provides Southeast Asian partner countries with satellite R&D and launch services. For example, the LAOSAT-1 project, which marks China's first endeavor to export an entire satellite and participate in ground operations, offers a range of services to Laos, including satellite communications, satellite TV live broadcast, wireless broadband, and more.

III. Directions to Push Forward China-ASEAN Cooperation in Emerging Industries

(i) Strategy: Upholding Mutual Benefit, Openness, and Inclusiveness While Placing Significant Emphasis on Cooperation in Emerging Industries

As the Asia-Pacific region is undergoing profound changes, the ASEAN region focuses on self-development and independent development. For instance, the *ASEAN Outlook on the Indo-Pacific* proposed to develop foreign relations with ASEAN as the centerand maintaining an open and inclusive regional architecture. This aligns well with China's "dual circulation" development paradigm, the BRI, RCEP, and CAFTA, all of which uphold the principles of multilateralism and regional economic integration. These shared principles establish a solid foundation for further cooperation between China and ASEAN. Looking ahead, the importance of China-ASEAN cooperation as a systematic project and long-term strategy should be clarified from a strategic perspective, while upholding mutual benefit, regional integration, multilateralism, and the free trade system. Based on existing bilateral and multilateral cooperation mechanisms, efforts should be made to foster an open, inclusive, and mutually beneficial business environment for cooperation and development in emerging industries with their strategic importance elevated and incentive policies, regulations, and standards optimized and implemented.

(ii) Market: Adhering to Cooperation Adaptive to Different Development Aspirations and Local Conditions

The economic conditions, emerging industry development situations, and development aspirations vary among ASEAN countries.

In this context, it's important to refine cooperation details and approaches under the overarching cooperation framework and dynamically adjust cooperation strategies based on characteristics of different development stages. The move tailors to different industrial development foundations, industrial complementarity, developmental stages, resource endowments, industrial advantages, etc., among individual countries. For countries with relatively weak development foundations, cooperation should be focused on strengthening cooperation in basic industries, labor-intensive industries, and infrastructure improvement. For countries with strong industrial bases and significant market potential, cooperation can be placed on areas such as high-end manufacturing and advanced technology, thereby optimizing the division of labor in the value chain through industrial complementarity.

(iii) Industry: Focusing on Key Industries and Key Industrial Chains for Cooperation

Cooperation should focus on key areas and focal points while fully considering the development advantages and market demands of both sides. First, the new energy industry can serve as the cornerstone of China-ASEAN emerging industry cooperation, with that in wind and solar PV power infrastructure and energy storage to enhance power grid capacity and boost renewable energy consumption. Second, semiconductors and high-end equipment can serve as the main direction to expand cooperation. Through technical and equity partnerships, parties involved can leverage the mature local industrial chains to carry out manufacturing, engineering research, and experimental development, while integrating upstream and midstream materials, equipment, and manufacturing of integrated circuits. Third, industrial chains of NEVs and upstream materials can serve as the major means to develop industrial clusters and expand cooperation models. Local market development can be accelerated by adopting a model that combines commodity trade, localized factory construction, and localized marketing and services. This approach can position the

area as a global production base and enhance cooperation in the smelting of upstream resources for power batteries as well as the downstream supporting industrial chain. Fourth, the digital economy can serve as a main way to enhance the level and depth of China-ASEAN cooperation. By prioritizing the e-commerce sector, cooperation can be boosted in cross-border e-commerce parks, e-commerce digital platforms, digital technology and infrastructure (e.g., big data, cloud computing, IoT, AI, 5G communications, and smart cities).

(iv) Model: Committing to In-depth Localized Development and Advancing Innovative Cooperation Models

Transnational industrial cooperation typically undergoes several stages including product trade, overseas assembly, localized production, and the creation of overseas brands and ecosystems and adopts various approaches such as goods trade, investment in factory construction, joint venture cooperation, global R&D, and technical cooperation. To promote the complementarity, connectivity, in-depth integration and development of industrial chains, efforts should be made in a steady and gradual way to align China's industrial foundations and strengths with the development aspirations and advantages of ASEAN countries. For instance, in automotive manufacturing, semiconductors, etc., efforts should be made to build localized industrial chains through such approaches as establishing joint ventures and local factories, while leveraging robust local advantages of industrial resources like Thailand's auto parts and tires. In the digital economy, technical cooperation and digital infrastructure development should be taken as the main direction while adhering to in-depth localization for development. Based on local industrial systems and talent, it's desirable to collaborate with local enterprises and research institutions for co-development of new technologies and products, and cultivate local suppliers and logistics companies, thereby improving production efficiency and reducing costs.

IV. Suggestions for the Development of China-ASEAN Cooperation in Emerging Industries

(i) Further Improving China-ASEAN Cooperation Mechanism with a Focus on Emerging Industries

Efforts should be made to expand economic and trade exchanges while enhancing mutual understanding and trust between China and ASEAN. This approach can promote high-quality development in trade and industrial cooperation through political mutual trust and cultivate a China-ASEAN community with a shared future. Under bilateral or multilateral cooperation mechanisms such as the BRI, RCEP, CAFTA, and Lancang-Mekong Cooperation, it is crucial to elevate the significance and strategic position of emerging industries, and establish a mechanism for dialogue and cooperation. The aim is to jointly set goals, principles, and cooperation models, driving innovative development and upgrading of the regional economy.

(ii) Innovating Diversified China-ASEAN Cooperation Models in Emerging Industries

Emerging industries feature extensive chains and a significant role in driving development. Within the RCEP framework, special emphasis should be placed on building closed-loop value chains that foster deep participation and stronger economic cooperation among involved countries. Examples include models like "China-Japan-ROK technology + China-ASEAN manufacturing + China-ASEAN market" and "ASEAN resources + Chinese manufacturing + Japan-ROK-Australia-New Zealand market". Moreover, making good use of interactive platforms such as the China-ASEAN Expo, and China-ASEAN Clean Energy Week and Cooperation Center, can help promote

communication and collaboration among governments, businesses, academic institutions, and civil organizations.

Drawing on the China-Malaysia and China-Indonesia "Two Countries, Twin Parks" model, the international industrial cooperation model based on industrial parks should be further explored and implemented, with a focus on such areas as PV, semiconductors, NEVs, power battery materials, and charging infrastructure. Additionally, supporting industry exchanges and resource-matching activities at regional and city levels can help establish a supply chain system, smoothing interactions between upstream and downstream suppliers. Technology transfer and sharing, joint research projects, and the establishment of joint laboratories should also be pursued to strengthen technical exchange and cooperation between China and ASEAN and reduce regional disparities.

(iii) Establishing Financial, Logistic and Human Resources Support Systems for International Cooperation in Emerging Industries between China and ASEAN

In terms of financial support, there is a need to encourage various entities in China and ASEAN, including banks, multilateral financial institutions, special funds, and policy-based financial institutions, to collaborate with enterprises and provide diversified financial assistance such as syndicated loans, sci-tech innovation loans, and letters of credit. Establishing the China-ASEAN cooperation fund for emerging industries is recommended to facilitate eligible enterprises and markets in piloting overseas financial services. Moreover, it is important to promote cooperation between banks, venture capital firms, and insurance companies from China and ASEAN countries to offer cross-border loans, investment insurance, and trade financing services.

As for logistics support, continuous efforts are required to streamline customs services, smooth China-ASEAN trade routes, and enlarge railway and road transportation channels for NEVs. Additionally,

it is crucial to support local customs to establish collaboration platforms and information-sharing mechanisms with local enterprises, further aligning the transport capacity with business requirements. Leveraging technologies like the IoT, big data, and blockchain will significantly enhance logistics efficiency and transparency.

Regarding talent support, it is important to enhance talent exchange and cooperation that aligns with digital, low-carbon, and EV strategies in China and ASEAN. This involves carrying out diverse exchange activities and establishing a talent information database to facilitate talent flow and sharing, as well as enhancing talent collaboration among universities and research institutions in research projects, technological innovation, and academic exchanges.

(iv) Pushing Forward the Exchange, Harmonization, and Cooperation on Standards and Regulations of China and ASEAN

It is crucial to establish an international standardization working group with internal and external coordination and create a coordinated mechanism for technological innovation, standard formulation, and industrial application in emerging industries. The focus should be on advancing harmonization and mutual recognition in standards across areas such as data management, complete vehicle certification, charging, and low-carbon development. To collectively address diverse trade requirements from various countries and regions worldwide, China and ASEAN should strengthen communication and coordination on laws, regulations and regulatory policies, and explore institutional opening-up in regional rules, management, and standards. It is suggested that the two sides enhance policy dialogue and coordination to reinforce connectivity and mutual trust in investment policies, market access rules, intellectual property protection, and regulatory standards. In addition, organizing relevant standard training activities can help optimize business and investment environments, ultimately lowering the barriers and risks of cross-border cooperation.

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