Through open competition, China's new energy industry has grown and strengthened, meeting its own low-carbon development needs while also driving global green economic growth. It has significantly lowered the threshold for "Global South" countries to develop their own new energy industries. Representing advanced production capacity, China's new energy sector has not only enriched global supply and alleviated global inflationary pressures but has also made significant contributions to global climate action and the energy transition.

The China Institute of International Studies, in collaboration with the Academy of China Council for the Promotion of International Trade, conducted a systematic study on the international contributions, development logic, and global cooperation of China's new energy industry, culminating in this research report.

CIIS Report

China's International Contributions to the New Energy Industry

China Institute of International Studies
Academy of China Council for the Promotion of International Trade

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China's International Contributions to the New Energy Industry

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Preface

01 Preface

China’s new energy industry is currently experiencing robust growth, demonstrating vigorous development impetus in areas such as technological innovation, industrial layout, and industrial transformation. The high-quality development of China’s new energy industry not only meets its domestic requirements for low-carbon development but also promotes global economic green growth through the export of new energy products such as electric vehicles, lithium batteries, and photovoltaic systems. This contributes technical support and capacity building to the international community in addressing climate change. The high-quality development of China’s new energy industry also provides a significant driving force for the global iteration of new energy technologies, significantly lowering the barriers for countries of the “Global South” to develop their own new energy industries. This contributes tangibly to the global energy transition. However, a small number of countries maliciously exploit the so-called “China’s overcapacity” theory, distorting China’s gradually accumulated comparative advantages into claims of “unfair competition,” and tarnishing China’s high-quality capacity, which benefits the global community, as a “shock to the world economy.” Their intent is to create a “China industrial threat” theory and implement protectionist policies to restrict the further development of China’s new energy industry. Such efforts to contain and suppress China’s new energy industry will inevitably increase the global cost of low-carbon development, impede the pace of the world’s low-carbon transition, undermine the global climate change agenda, and erode confidence in cooperation on addressing climate change. Furthermore, they will fuel anti-globalization sentiments,

harm the already weak global economy, and disrupt the open world economic system. High-quality development is the primary task in building China into a modern socialist country in all respects, with harmony between humanity and nature being an inherent requirement. Therefore, China will continue to promote its own green economic and social development, progressing steadily toward its goal of achieving carbon neutrality by 2060. True flourishing comes through collective growth, not individual success along. While advancing its own low-carbon development, China will also strengthen international exchanges and cooperation in global green development, working together with all countries to face the challenges of climate change and to build the Earth into a beautiful home. This will contribute to the shared construction of a global community of life on Earth and a clean, beautiful world.

China's International Contributions to the New Energy Industry

02

Global contributions of China’s new energy industry

- China as an indispensable pillar of the global green transition
- China as a key partner for "Global South" countries in new energy industry development
- China as a key driver of global new energy technology iteration
- China as an active contributor to global climate governance

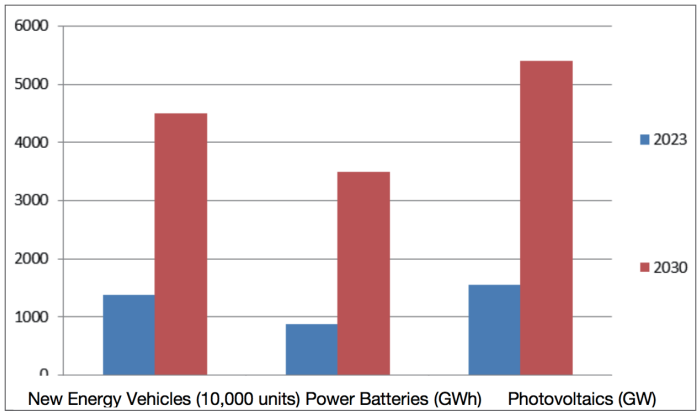
02 Global contributions of China’s new energy industry

Since China made its solemn commitment at the United Nations regarding carbon peak and carbon neutrality goals in 2020, China’s green industries - including new energy vehicles, wind power, and photovoltaics - have entered a phase of rapid development, driven by both technological innovation and market demand. Through the export of the “New Trio” - electric vehicles, lithium batteries, and photovoltaic systems - China continues to provide crucial support for global energy transition, demonstrating its proactive response to global green and low-carbon transformation requirements and its assumption of responsibilities as a major country. While promoting its own economic and social development and achieving green transition, China continuously advances international exchange and cooperation in green development, contributing Chinese technology, products, and solutions to reduce the costs for global green transition and improve the efficiency of related technological innovations.

1. China as an indispensable pillar of the global green transition

Controlling greenhouse gas emissions has become a global consensus and action, with more than 150 countries already declaring their targets for achieving net-zero emissions by the middle of the 21st century. The development of renewable energy and the promotion of a low-carbon energy transition have become the shared direction of the international community, leading to a sustained growth in the demand for green production capacity. However, the task of green low-carbon development is urgent and challenging, with a significant gap in green production capacity hindering the

achievement of the Sustainable Development Goals 2030. This has become a major bottleneck in the current global economic green development. According to the International Energy Agency, global demand for new energy vehicles is expected to reach 45 million units by 2030, more than three times the global sales in 2023. The global demand for power batteries is projected to reach 3.5 billion kilowatt-hours by 2030, more than four times the global shipments in 2023. Additionally, according to the International Renewable Energy Agency, to achieve the goals of the Paris Agreement, the cumulative global photovoltaic installed capacity must exceed 5400 gigawatts by 2030, nearly four times the global cumulative capacity in 2023. Evidently, current global production capacity for new energy products falls far short of future market demand. In the process of advancing green and low-carbon transition, sectors such as electric vehicles harbor massive market potential, presenting shared opportunities for development across all nations.



Source: "New Energy Industry Survey," Economic Daily, July 29, 2024, Page 12

Faced with the increasing demands for high-level energy security arising from economic and social development, the pursuit of a better life for its people, and the goals of carbon peak and carbon neutrality, China's new energy industry has continually expanded in scale, providing strong support for the energy security of its 1.4 billion people and steadily advancing the country's green economic and social transition. In terms of global new energy and renewable energy installations, China accounts for 40% of the total, with 60% of new installations occurring in China. By the end of 2023, China's installed capacity for new energy and renewable energy generation exceeded 1500 gigawatts, surpassing the installed capacity of thermal power generation for the

first time in history. The share of renewable energy in the total installed capacity for power generation in China now exceeds 50%. Among this, the combined installed capacity of wind power and photovoltaic generation has surpassed 1 billion kilowatts, accounting for more than one-third of the country's total installed power generation capacity.[①]

China's new energy industry, leveraging its scale advantages, plays a significant role in bridging the global market gap for new energy products. China's new energy products provide businesses and consumers worldwide with green, intelligent solutions for both production and daily life. Currently, China's photovoltaic and wind power products are exported to and widely accepted in more than 200 countries and regions, demonstrating that this production capacity is in great demand in the global market. In fact, faced with the enormous gap in global green production capacity, China's existing new energy production capacity is not excessive, but rather insufficient to meet global needs.

The cost advantages of Chinese-manufactured photovoltaic modules and wind power equipment have created favorable conditions for renewable energy adoption across an increasing number of countries. According to the International Renewable Energy Agency, over the past decade, the average levelized cost of electricity (LCOE) for global wind power and photovoltaic power projects has decreased by more than 60% and 80% respectively, with China being a major contributor to this reduction.[②]

Addressing climate change challenges and achieving sustainable energy utilization requires accelerating global energy transition. All nations must collaborate to safeguard Earth, our shared home.

2.China as a key partner for "Global South" countries in new energy industry development

Currently, Chinese enterprises are establishing overseas production bases and

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① Zhang, Jianhua:. Strongly Support High-level Energy Security through High-quality New Energy Development, Study Times, 2024, August 15, p.1.

② White Paper on China's Energy Transition, State Council Information Office, August 29, 2024, http://www.nea.gov.cn/2024-08/29/c_1310785406.html

marketing networks, promoting integration between domestic and international markets, enhancing the economic efficiency of the entire energy value chain, and transforming global energy transition into a consensus-driven action that "expands the pie" for the international community. In line with the principles of consultation, joint construction, and shared benefits, Chinese enterprises are expanding international cooperation in the new energy sector, thereby enabling greater economic development in "Global South" countries during their green transition. For example, Chinese enterprises have provided inverter technology for Thailand, assisting in the construction of large-scale photovoltaic power plants and supporting Mahidol University in building a "Carbon Neutrality Campus." Utilizing the rooftops of 41 buildings on campus, a 15,000-kilowatt photovoltaic system, along with a 600-kilowatt-hour energy storage system and fully optimized inverters, was established. This system is expected to save $2.7 million annually in electricity costs and reduce carbon dioxide emissions by 11,000 tons per year.

Figure 2 Mahidol University's Carbon Neutrality Campus

Source: Huawei's Official Website, https://solar.huawei.com/cn/success-stories/cn/2024/Storie51

Chinese enterprises cooperated with the United Arab Emirates in building the world-class photovoltaic power plant project—Al Dhafra Solar Power Project, which is currently the largest existing single-site photovoltaic power plant in the world. The project covers an area of approximately 21 square kilometers, with an installed capacity of 21 million kilowatts. The generated electricity can meet the power needs of about 200,000 households in the UAE. It is expected to reduce carbon emissions by over 2.4 million tons annually, provide around 5,000 local jobs, and increase the share of clean energy in the UAE's total energy mix to more than 13%.

Figure 3: Al Dhafra Solar Power Plant, UAE

Source: https://www.yidaiyilu.gov.cn/p/02OF5THU.html

The Garissa Power Plant in Kenya, constructed by Chinese enterprises, stands as East Africa's largest photovoltaic power station to date, with annual power generation exceeding 76 million kilowatt-hours. In terms of environmental impact, the station helps Kenya save approximately 24,470 tons of standard coal and reduces carbon dioxide emissions by about 64,000 tons annually. The facility meets the electricity needs of 70,000 households, serving approximately 380,000 people. Beyond addressing the persistent problem of power outages for local residents, the project has fostered local industrial and commercial development while creating substantial jobs in the region.

Figure 4: Garissa Solar Power Plant, Kenya

Source: http://www.xinhuanet.com/world/2023-08/24/c_1129820339.htm.

China has consistently been a firm supporter of sustainable development in Africa. Green development is not only a component of the "Eight Major Initiatives" and "Nine Programs" implemented under the Forum on China-Africa Cooperation (FOCAC), but also a key area for the high-quality Belt and Road cooperation with Africa.

China has in fact implemented hundreds of clean energy and green development projects across Africa. Chinese enterprises have collaborated with Africa to build photovoltaic power plants with a cumulative installed capacity of over 1.5 gigawatts, leading international green cooperation efforts in Africa. In Morocco, the Noor II and III solar-thermal power plants constructed by Chinese enterprises provide clean energy for over 1 million Moroccan households, fundamentally changing Morocco's long-term dependence on electricity imports. In South Africa, the De Aar Wind Farm invested and built by Chinese enterprises provides 760 million kilowatt-hours of stable clean electricity annually, meeting the power needs of 300,000 households and reducing carbon emissions by 619,900 tons. In Uganda, the Chinese-built Karuma Hydropower Station, now Uganda's largest hydroelectric facility, has increased the country's total power installation capacity by nearly 50%. The station saves 1.31 million tons of coal annually and reduces carbon emissions by 3.48 million tons, equivalent to planting 1.5 million trees.

China-Africa green energy cooperation has powered millions of homes across the African continent while illuminating the path toward Africa's sustainable development. Looking ahead, Chinese enterprises will continue to expand cooperation with Africa in renewable energy, energy conservation, and emissions reduction, helping Africa accelerate its energy transition and achieve green, low-carbon, high-quality development.

Source: Website of China's Ministry of Foreign Affairs: https://www.fmprc.gov.cn/fyrbt_673021/jzhsl_673025/202404/t20240412_11280916.shtml

Currently, countries in the "Global South" remain heavily dependent on traditional fossil fuels and face several challenges in achieving green development and energy transition. Examples include insufficient funding, weak equipment manufacturing technology, and a shortage of technical professionals. This creates a strong demand for international cooperation in green and clean energy. China actively helps develop solar and wind power industries in "Global South" countries based on their local energy resource endowments. For example, the solar power station project provided

for Cuba has a total installed capacity of 9,000 kilowatts, delivering 12.85 million kilowatt-hours of clean energy to the power grid annually, effectively filling local power shortages. China has also actively built clean energy demonstration projects in countries like Gabon and Fiji, helping increase their power supply while reducing adverse environmental impact.[①] Through the Global Development and South-South Cooperation Fund and the Climate Change South-South Cooperation Fund, China continues to support green economic development in Global South countries. Since 2016, China has initiated extensive cooperation projects in developing countries, launching ten low-carbon demonstration zones and implementing one hundred climate change mitigation and adaptation projects. The country has also provided training for a thousand participants in addressing climate change and carried out over two hundred foreign aid projects focused on climate change response. China's integrated assistance model combining green concepts, green technology, and clean energy has not only effectively alleviated energy shortages in host countries but also contributed to green and low-carbon development in Global South countries.

Figure 5: Bukhara Wind Farm, Uzbekistan

① China's International Development Cooperation in the New Era, State Council Information Office, http://www.scio.gov.cn/gxzt/dtzt/2021/xsddzggjfzhzbps/

This project, constructed by Chinese enterprises, is the largest single-site wind power project under construction in Central Asia and uses the longest wind turbine blades in the region. During construction, it has created over 500 local jobs. Once operational, the project is expected to generate 3.5 billion kilowatt-hours of electricity annually, significantly improving local power supply capacity and energy mix, benefiting millions of residents in Uzbekistan.

3.China as a key driver of global new energy technology iteration

Green and low-carbon technologies serve as a crucial driving force in the formation of new productive forces. Technological breakthroughs in power batteries, photovoltaic cells, and wind turbines have become prominent markers of the new round of scientific and technological revolution and industrial transformation. China's new energy technology continuously upgrades, leading to fundamental changes in the structure of factor endowments, and digital and green transformations are integrated. In addition, costs for new energy products are significantly reduced through large-scale application. All these have blazed new pathways for high-quality development of the new energy industry. By focusing on building an economic system geared toward green, low-carbon and circular development, China is accelerating the formation of an industrial structure with high technological content, low resource consumption, and minimal environmental pollution. This has substantially enhanced the green transformation of the economy, establishing development on the foundation of efficient resource utilization, strict environmental protection, and effective greenhouse gas emission control, thereby injecting vitality into economic development. Against the backdrop of sluggish global economic recovery, China's technology-driven production, represented by the new energy industry, has become particularly important, making significant contributions to global sustainable development.

Figure 6: Al-Shubakh 26GW Photovoltaic Project, Saudi Arabia

This project, constructed by Chinese enterprises, utilizes the world's most advanced N-type bifacial photovoltaic modules and single-axis automatic tracking brackets. After completion, it is expected to generate approximately 282.2 billion kilowatt-hours of electricity in total over 35 years, making a positive contribution to accelerating energy mix transformation in Saudi Arabia's and global green low-carbon development.

Over the years, China has continuously promoted innovation in new energy technologies, with many core technologies being first introduced or implemented on a large scale by Chinese enterprises. In the photovoltaic sector, China's solar power technology has rapidly iterated, repeatedly breaking world records for cell conversion efficiency. China's photovoltaic panels lead globally in energy efficiency, benefiting from the country's dual advantages in technology and scale in the photovoltaic industry, which has led to a significant decrease in global photovoltaic deployment costs. In 2023, the cost of Chinese photovoltaic modules already decreased to less than 1,000 yuan per kilowatt, representing a reduction of over 90% compared to 2010. As Chinese photovoltaic products have entered the global market, solar power deployment costs in many regions worldwide have become comparable to or lower than traditional energy generation costs.[①]

① New Energy Industry Survey, Xinhua Net, July 29, 2024, http://www.xinhuanet.com/fortune/20240729/eb621d1c1a344b4b9e99cbb2cbd2dcb8/c.html

In the wind power sector, China maintains international leadership in the development of large-capacity units, long blades, and high tower applications, while continuously achieving breakthroughs in high-power wind turbines, ultra-low wind speed turbines, and deep-sea offshore wind power technologies. Compared to 2010, China's lithium battery costs in 2023 decreased by 90%, from 4 yuan per watt-hour to 0.4 yuan, [①] significantly promoting the global adoption of new energy vehicles. As Chinese new energy enterprises continue to enhance their global competitiveness and influence, related industries will persistently improve their technological capabilities, explore more cooperation models, lead global industrial development, and support worldwide efforts in addressing climate change and accelerating energy transition.

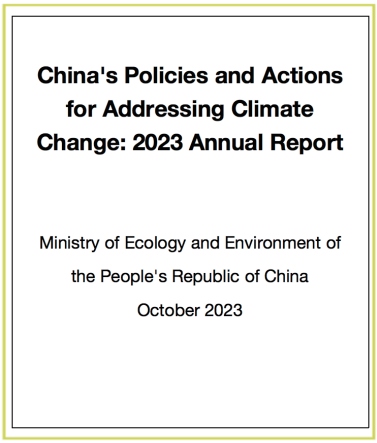
4. China as an active contributor to global climate governance

As the world's largest developing country, under the guidance of Xi Jinping Thought on Ecological Civilization, China actively, comprehensively, and effectively participates in global climate governance. Despite developmental challenges related to resource endowments and population scale, China has made significant contributions to global energy transition. From improving top-level design for addressing climate change to building the world's largest clean energy system, China has consistently maximized its efforts to strengthen climate change response and promote a complete green and low-carbon transition in socio-economic development.

The Third Plenary Session of the 20th CPC Central Committee proposed a series of goals for further deepening reform comprehensively, including "accelerating the complete green transition in socio-economic development." The CPC Central Committee and the State Council recently issued the "Opinions on Accelerating the Complete Green Transition in Socio-economic Development," marking China's first systematic deployment of complete green transition at the national level. After proposing its "dual carbon" goals, China has proactively proposed "complete green transition." At a time when the global green transition process faces setbacks, climate issues become increasingly politicized, and green trade barriers escalate, China has contributed a crucial piece to complete the puzzle for our fragmented blue planet.

Source: Resolution of the Central Committee of the Communist Party of China on Further Deepening Reform Comprehensively to Advance Chinese Modernization, Xinhua Net, July 21, 2024, http://www.news.cn/politics/20240721/cec09ea2bde840dfb99331c48ab5523a/c.html

① Same as the previous reference.



First, China's new energy industry has significantly enhanced global renewable energy production capacity. In 2023, global renewable energy installations increased by 510 million kilowatts, with China contributing over half of this growth. [①]Second, China's new energy industry has made a positive contribution to global climate change mitigation by promoting energy greening. According to data from China's National Energy Administration, in 2022, the country's renewable energy generation helped reduce domestic carbon dioxide emissions by approximately 2.26 billion tons. The export of wind power and photovoltaic products also reduced carbon dioxide emissions by around 573 million tons in other countries, bringing the total reduction to over 2.8 billion tons, accounting for about 41% of the global carbon reduction from renewable energy during the same period.[②] It is estimated that China contributed 41% of the global carbon reduction from renewable energy, 2.5 times that of the United States, 4.1 times that of Canada, 7.0 times that of India, and 8.6 times that of Germany.[③] Third, China's development in its new energy industry is leading global energy mix adjustment and strongly promoting the achievement of UN Sustainable Development Goals. From firmly promoting green and low-carbon energy transition to continuous innovation in energy technology and leading multiple energy technologies globally, China is becoming a crucial force in advancing global clean energy development within the landscape of low-carbon transition in global economy.

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① Pan Huimin, Global Renewable Energy New Installations Reach 510 million Kilowatts in 2023, China Contributes Over 50%, National Energy Administration Official Website

② Transcript of National Energy Administration's Press Conference for Q1 2023, Chinese Government Website, https://www.gov.cn/xinwen/2023-02/14/content_5741481.htm

③ New Energy Industry Survey, http://www.xinhuanet.com/fortune/20240729/eb621d1c1a344b4b9e99cb-b2cbd2dcb8/c.html

The Ministry of Ecology and Environment has released China's Policies and Actions for Addressing Climate Change: 2023 Annual Report, which introduces China's new progress in addressing climate change since 2022. The report summarizes China's new deployments and requirements for climate change response, and reflects progress across multiple key areas. These include controlling greenhouse gas emissions in key sectors, adapting to climate change, building carbon markets, implementing policy and support measures, and actively participating in global climate change governance.

China's International Contributions to the New Energy Industry

03

China's new energy industry advantages and their formation

- Head-of-State Diplomacy Playing the Role of Strategic Guidance
- Smooth Operation of Cooperation Mechanisms at Various Levels and Areas
- Unity and Mutual Support

03 China’s new energy industry advantages and their formation

China’s new energy industry has undergone more than a decade of competitive refinement, gradually developing comprehensive competitive advantages in products, markets, and technology. The formation of China’s new energy industry advantages has relied on the guidance of new development philosophy and forward-looking policies, benefiting from continuous investment in scientific innovation and research, strong support from the complete industrial chain, and the vibrant dynamism brought by open cooperation.

1.New development philosophy leading complete green transition in socio-economic development

Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a New Era, China adheres to the concept that lucid waters and lush mountains are invaluable assets. The country has unwaveringly pursued a path prioritizing ecological protection and green development, promoting complete green transition in socio-economic development, and building modernization of harmony between humanity and nature. Green development has become a distinctive feature of Chinese modernization. China upholds the new development philosophy of innovative, coordinated, green, open and shared development. With innovation-driven development as the leading force shaping new economic momentum and advantages, China actively builds a production system geared toward green, low-carbon, and circular development alongside a clean, low-carbon, safe, and efficient new energy system. Standing with

a sense of responsibility toward the future of humanity, China actively participates in addressing global climate change. The country has made commitments to the world to strive for carbon peak by 2030 and carbon neutrality by 2060. Using these carbon peak and neutrality goals as drivers for green transition, China is adopting a more proactive stance in conducting bilateral and multilateral international cooperation in green development.

Carbon Peak and Carbon Neutrality Goals

Humankind should launch a green revolution and move faster to create a green way of development and life, preserve the environment and make Mother Earth a better place for all. Humankind can no longer afford to ignore the repeated warnings of Nature and go down the beaten path of extracting resources without investing in conservation, pursuing development at the expense of protection, and exploiting resources without restoration. The Paris Agreement on climate change charts the course for the world to transition to green and low-carbon development. It outlines the minimum steps to be taken to protect the Earth, our shared homeland, and all countries must take decisive steps to honor this Agreement. China will scale up its Intended Nationally Determined Contributions by adopting more vigorous policies and measures. We aim to have CO2 emissions peak before 2030 and achieve carbon neutrality before 2060. We call on all countries to pursue innovative, coordinated, green and open development for all, seize the historic opportunities presented by the new round of scientific and technological revolution and industrial transformation, achieve a green recovery of the world economy in the post-COVID era and thus create a powerful force driving sustainable development.

Source: President Xi Jinping's Statement at the General Debate of the 75th Session of the United Nations General Assembly, http://www.cidca.gov.cn/2020-09/23/c_1210813555.htm

The robust growth of China's new energy industry represents a vital step in implementing new development principles, advancing the nation's "Dual Carbon" strategy, and responding to global demands for green transition. Guided by the new development philosophy and supported by strategic policies and technological advances, the industry has achieved remarkable success, emerging as a key element of both China's new quality productive force and its modern industrial framework.

2. Forward-looking policies promoting steady growth of the new energy industry

China established and implemented relevant laws and policies early to guide the development of its new energy industry. The process began with the Renewable Energy

Law in 2006, followed by the 2007 Medium and Long-term Development Plan for Renewable Energy and the 2009 Automotive Readjustment and Revitalization Plan, which proposed developing low-carbon industries such as solar energy and new energy vehicles. These initiatives provided a clear and stable policy environment for new energy industry development, actively promoting technological innovation and industrial applications. In 2010, the State Council's Decision on Accelerating the Cultivation and Development of Strategic Emerging Industries designated the new energy sector as a strategic emerging industry. It proposed leveraging China's massive domestic market to rapidly enhance innovation capabilities, accelerate the promotion of solar thermal technology applications, and develop diversified markets for solar photovoltaic and thermal power generation. The decision also aimed to improve wind power technology and equipment while systematically promoting large-scale wind power development. To drive cost reduction, efficiency improvement, and sustainable development in the new energy industry, the government has guided collaboration among enterprises, universities, and research institutions focusing on core industrial technologies and frontier innovations. These guiding measures have helped markets "self-discover," while the stable policy environment provides necessary assurance for further market development. The steady growth of China's new energy industry relies on the strategic guidance of new development philosophy and the government's strategic commitment to new energy development, with consideration for overall social benefits.

3. Technological innovation driving quality improvement and upgrading of the new energy industry

China's new energy industry continues to advance through technological innovation and industrial upgrading, steadily enhancing its international competitiveness. The power battery sector exemplifies this progress. Chinese enterprises have established research and development platforms with numerous universities, driving innovation in lithium battery technology and enhancing battery system intelligence. They have gained technological advantages in both ternary lithium batteries and lithium iron phosphate batteries, and developed next-generation power batteries like the "Blade Battery" and "Qilin Battery" that boast both high energy density and enhanced safety performance. Chinese companies have also established leadership in intelligent monitoring, big data analytics, and cloud management. This technological advancement has created opportunities for international cooperation, as demonstrated by CATL's partnership with Ford Motor Company to build a new power battery factory in Michigan, USA.

Under their agreement, CATL will provide technical and service support for Ford's new lithium iron phosphate battery factory, including battery patent technology licensing, while Ford engineers will handle cell and vehicle integration work, with some equipment being imported from China.

BYD "Blade Battery"

In March 2020, BYD introduced its innovative Blade Battery, debuting in the "Han" model. This next-generation lithium iron phosphate battery earned its name from its unique design, where battery cells are inserted like blades into the battery pack. The revolutionary design eliminates the need for traditional module-level assembly, dramatically improving space efficiency. The result is a battery pack that achieves over 50% better volume utilization compared to conventional modular designs, while matching the driving range of high-energy ternary lithium batteries.

Source: BYD Official Website, https://pv.byd.com/sites/Satellite?c=News&cid=1514436219679&d=Touch&pagename=BYD_SUN%2FPage%2FNews%2FnewsDetails&rendermode=preview

From a patent number perspective, China's new energy industry shows promising prospects for continued innovation breakthroughs. The Annual Report on Photovoltaic IP Development (2024), jointly released by the National Industrial Information Security Development Research Center, the Electronic Intellectual Property Center of the Ministry of Industry and Information Technology, and the Intellectual Property Professional Committee of China Photovoltaic Industry Association, reveals China's global leadership in the photovoltaic sector, with 168,000 total patent applications, 73,000 valid patents, and 22,000 valid invention patents across the entire industry chain.[①] In offshore wind energy, a joint report by the European Patent Office and the International Renewable Energy Agency shows that China accounts for 52% of patent applications, followed by South Korea (6%), Germany (5%), Japan (5%), the

① Release of Annual Report on Photovoltaic Industry Patent Development (2024) Shows Steady Progress in Advancing Intellectual Property Ecosystem, China Daily, June 26, 2024, https://cn.chinadaily.com.cn/a/202406/26/WS667b823da3107cd55d26896e.html

United States (4%), and Denmark (4%).[①] China has also established itself as a leading technology source in power batteries. As of May 2023, China holds 7,640 patent applications for key solid-state battery technologies, representing 36.7% of the global total of 20,798, second only to Japan. Notably, China's patent applications in this field have grown at an average annual rate of 20.8% over the past five years, the fastest growth rate worldwide.[②]

CATL's "Qilin Battery"

CATL introduced its third-generation CTP (Cell-to-Pack) technology, named the "Qilin Battery." This innovative battery system achieves a remarkable volume utilization rate exceeding 72%, enabling electric vehicles to reach ranges of up to 1,000 kilometers. Through three groundbreaking technological innovations - breaking functional boundaries, restructuring spatial design, and revolutionizing traditional liquid cooling - the Qilin Battery significantly advances energy density performance. The system achieves 255Wh/kg for ternary batteries and 160Wh/kg for lithium iron phosphate batteries. When compared to the 4680 system using the same chemical system and battery pack dimensions, the Qilin Battery pack delivers 13% more power capacity. This breakthrough brings comprehensive improvements across all key performance metrics: range, fast charging capabilities, safety features, battery lifespan, overall efficiency, and low-temperature performance.

Source: CATL Official Website, https://www.catl.com/news/6467.html

4. Complete industrial chain supporting large-scale development of new energy industry

China's new energy industry has developed rapidly across all segments, with supporting enterprises continuously advancing technological innovation. The industry has gradually formed a complete industrial chain from materials research and development, engineering design to manufacturing management and final assembly integration. This

① Offshore wind energy: Patent insight report, International Renewable Energy Agency https://www.irena.org/Publications/2023/Nov/IRENA-EPO-Offshore-Wind-Energy-Patent-Insight-Report

② Ranking First in Global Patent Application Growth Rate for Past 5 Years, China Leads World in Solid-State Battery R&D, China Energy News, January 8, 2024, P. 15.

comprehensive chain has not only overcome core technological limitations but also effectively reduced costs, enabling large-scale product deployment.

In the wind power sector, China possesses both technologically advanced downstream turbine assembly and integration companies, as well as numerous competitive upstream enterprises producing blades, main bearings, gearboxes, generators, and converters. This has formed a comprehensive wind power industrial and supply chain covering 27 major categories and over 70 subcategories, ranging from wind power development and construction to equipment manufacturing, technical research, testing certification, and supporting services. In the photovoltaic sector, China has established a complete industrial chain integrating research and development, manufacturing, sales, and applications. This chain extends from upstream raw material collection and processing, through midstream solar cell and module manufacturing, to downstream photovoltaic power station construction and operation. The industry shows clear geographical distribution: upstream industries like polysilicon production are mainly concentrated in western regions, midstream industries such as solar cell production are primarily located in eastern coastal provinces, while downstream industries are distributed nationwide. In the new energy vehicle sector, China has achieved effective collaborative development across the industrial chain, featuring both upstream power battery industry leaders and well-known downstream vehicle manufacturers.

Figure 8: A View of Xinghua Bay Offshore Wind Farm in Fuqing, Fujian Province

Source: http://www.news.cn/fortune/2022-11/03/c_1129096715.htm

With close and efficient upstream and downstream coordination, China's new energy products have achieved remarkable improvements in both price competitiveness and technological capabilities, reaching significant deployment scale. According to the data from the National Energy Administration, as of June 2024, China's installed capacity reached 427 million kilowatts for hydropower, 467 million kilowatts for wind power, 714 million kilowatts for solar power, and 45.3 million kilowatts for biomass power. Notably, the combined installed capacity of wind and photovoltaic power has surpassed coal-fired power, reaching 1.18 billion kilowatts.[①] In the photovoltaic manufacturing chain, more than five Chinese companies rank among the global top ten in each segment: polysilicon, silicon wafers, solar cells, and modules.[②] China has maintained its position as the world's largest electric vehicle market since 2015, with balanced production and sales. In 2023, production reached 9.587 million units and sales reached 9.495 million units, capturing 31.6% of the domestic market.[③] According to the latest data released by the China Passenger Car Association on August 8, 2024, new energy passenger vehicles achieved a domestic retail penetration rate of 51.1% in July, with sales of 878,000 units compared to 841,000 conventional fuel vehicles.[④] This milestone marks that the monthly retail sales for new energy passenger vehicles surpassed those for traditional fuel vehicles for the first time, signifying the emergence of new energy vehicles as mainstream in the Chinese market.

5. Open cooperation activating growth momentum in the new energy industry

The Chinese government has continuously promoted external openness and cooperation through a series of measures, including significantly relaxing foreign investment access restrictions and completely removing foreign investment limitations in sectors such as new energy. These initiatives have activated growth momentum in the new energy

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① China's Wind Power and Photovoltaic Power Generation Installation Scale Exceeds Coal Power, National Energy Administration, August 2, 2024, https://www.nea.gov.cn/2024-08/02/c_1310783697.htm

② Clean Energy Illuminates Green Economy (Industry and Economic Observation), People's Daily Online, October 21, 2020, http://ip.people.com.cn/n1/2020/1021/c136655-31900161.html

③ New Energy Vehicle Market Flourishes with Record-Breaking Production and Sales, Xinhua News, January 24, 2024, http://www.news.cn/auto/20240124/96eee636fce74881aa28c9d2774cae51/c.html

④ In-depth Analysis Report of National New Energy Market for July 2024, China Passenger Car Association, http://www.cpcaauto.com/newslist.php?types=csjd&id=3575

industry.

China's new energy industry has achieved remarkable success in facing open market competition, forging internationally competitive brands. Taking new energy vehicles as an example, the industry includes both traditional automakers undergoing transformation and upgrading, emerging enterprises eagerly joining the market, along with foreign-owned automobile manufacturers like Tesla taking an active part. Various automotive companies engage in intense competition around configuration, pricing, and service, striving to launch vehicles with high technological content and excellent user experience. This competition has driven the entire industrial chain to accelerate breakthrough developments, injecting strong vitality into new energy development. According to a report of the International Energy Agency, China's market contributed three-fifths of global electric vehicle sales in 2023, with electric vehicles accounting for more than one-third of new vehicle transactions, significantly higher than other countries or regions worldwide.[①]

China's new energy industry has demonstrated strong vitality through extensive international cooperation, winning market opportunities and development space through high-quality projects. Focusing on green and low-carbon energy transition, China engages in extensive and sustained bilateral and multilateral cooperation with various countries through experience sharing, technical exchanges, and project matching in renewable energy development and low-carbon city demonstration. Notable examples include the Kaléta Hydroelectric Project in Guinea, the Kaposvár Solar Power Plan Project in Hungary, the Dubai Solar Thermal and Photovoltaic Hybrid Power Project in the UAE, and Pakistan's Karot Hydropower Station and Phase I of the Quaid-e-Azam Solar Park Project.[②]

① "Global EV Outlook 2024," International Energy Agency, https://www.iea.org/reports/global-ev-outlook-2024/trends-in-electric-cars

② White Paper China's Energy Development in the New Era, Chinese Government Website, https://www.gov.cn/zhengce/2020-12/21/content_5571916.htm

Tesla Increases Investment in China

Tesla was the first wholly foreign-owned automobile manufacturer to enter the Chinese market. Construction of Tesla's Shanghai Gigafactory officially began in early 2019, with the first deliveries completed by the end of that year. Located in Shanghai's Pudong New Area, the Shanghai Gigafactory covers 860,000 square meters, making it Tesla's largest vehicle manufacturing facility outside the United States. The facility produces the Model 3 and Model Y, both popular models in Europe and other overseas markets.

Data shows that the Shanghai Gigafactory achieved total deliveries of 947,000 vehicles in 2023, a 33% year-over-year increase, accounting for more than half of Tesla's global production capacity. Following the Shanghai Gigafactory, Tesla continues to increase its investment in China. On December 22, 2023, Tesla completed land acquisition agreements in Shanghai, announcing the official launch of its first energy storage Gigafactory project outside the United States, with production planned to begin in 2024.

Source: People's Daily Online, http://sh.people.com.cn/n2/2024/0122/c134768-40721708.html

China's International Contributions to the New Energy Industry

04

Maintaining an open world economy and building a clean, beautiful world

- Promoting global green transition is the common expectation and aspiration of the international community
- Maintaining stable global industrial and supply chains is an inevitable requirement of economic globalization
- Firmly promoting the construction of an open world economy
- Global new energy industry's healthy development requires afair trade environment
- Promoting inclusive global green transition through open cooperation

04 Maintaining an open world economy and building a clean, beautiful world

On October 4, 2023, the European Commission initiated an anti-subsidy investigation into Chinese electric vehicles. In May 2024, the Biden administration announced high tariffs on Chinese new energy products, including electric vehicles and solar cells, citing "overcapacity." On October 29, 2024, the European Commission published its final anti-subsidy investigation ruling, announcing additional anti-subsidy duties of 17%-35.3% on electric vehicles imported from China for five years, on top of the existing 10% tariff. The unilateral actions by the US and EU essentially introduce protectionism into the new energy industry sector. These measures not only encourage current anti-globalization trends and weaken the World Trade Organization (WTO)-centered multilateral trading system, but also impede the pace of global economic green transition and hinder collective efforts to address climate change.

1. Promoting global green transition is the common expectation and aspiration of the international community

Protecting the ecological environment and addressing climate change are shared responsibilities of all humanity. Only through unity, cooperation, and joint efforts among all nations in promoting green and sustainable development can we maintain Earth's overall ecological balance and safeguard humanity's only home. The international community shares common goals of strengthening participation in global environmental governance, promoting green transition driven by carbon peak and neutrality targets, taking more proactive stances in international cooperation for green

development, and advancing the building of a fair and rational global environmental governance system for win-win results.

Addressing Climate Change: An International Consensus

On June 5, 2024, the World Environment Day, UN Secretary-General António Guterres called on the world to mobilize, take action, fulfill commitments, and act on climate change. He emphasized that people should act with urgency, as now is the crucial moment to face facts. Guterres noted that renewable energy is flourishing as costs plummet and governments recognize the benefits of cleaner air, quality employment opportunities, energy security, and increased power supply. Renewable energy now accounts for 30% of global electricity supply.

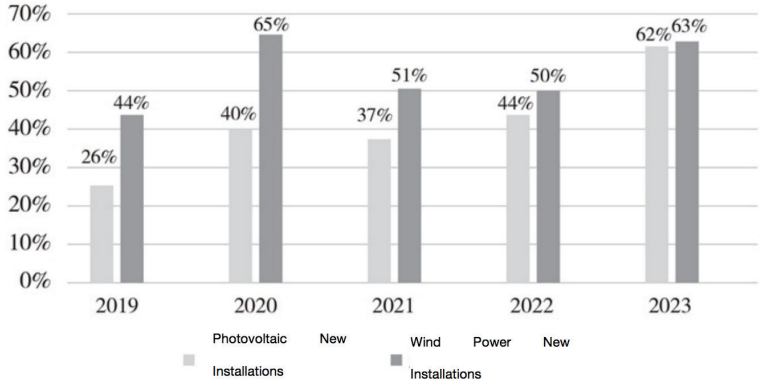
The "People's Climate Vote 2024" survey, conducted by the United Nations Development Programme in collaboration with the University of Oxford and GeoPoll, a mobile surveying institution, revealed that over 86% of people want to see their countries set aside geopolitical differences to jointly address climate change. This level of consensus is particularly noteworthy against the backdrop of intensifying global conflicts and rising nationalism. UNDP Administrator Achim Steiner stated that the voice of the People's Climate Vote is loud and clear: people worldwide want their leaders to transcend differences, take immediate action, and boldly address the climate crisis.

Source: United Nations Official Website, https://news.un.org/zh/story/2024/06/1129116; https://news.un.org/zh/story/2024/06/1129446

Strengthening international cooperation and expanding renewable energy deployment has become a consensus in the international community. In November 2023, China and the United States issued the “Sunnylands Statement on Enhancing Cooperation to Address the Climate Crisis,” indicating both countries’ willingness to strengthen cooperation on climate action and jointly promote global renewable energy development. In December 2024, the 29th Conference of the Parties (COP29) to the United Nations Framework Convention on Climate Change concluded with important consensus among countries on addressing climate change and promoting sustainable development. The conference reached the “Baku Climate Unity Pact,” establishing post-2025 climate finance goals and related arrangements. This laid the foundation for developing countries to undertake climate actions and prompted developed countries to take concrete actions on key issues, helping accelerate global climate governance and advance global green and low-carbon transition. However, certain countries demonstrate contradictory behavior. While calling for addressing global climate change

as humanity's "noble mission" and demanding China take more responsibilities, they simultaneously implement protectionist measures citing "overcapacity" to specifically target China's new energy industry and restrict Chinese new energy product exports. This contradictory approach not only seriously damages their own credibility but also undermines the trust foundation for advancing global governance cooperation, significantly impacting global efforts and effectiveness in addressing climate change.

China's development of the new energy industry has made substantial contributions to advancing global development. Taking a broader perspective aligned with building a community with a shared future for mankind, China actively practices sustainable development concepts and comprehensively promotes green production methods and lifestyles, becoming a significant force in driving global green and low-carbon transition. Over the past decade, China has consistently accounted for over 40% of annual global renewable energy capacity additions. Global non-fossil energy consumption has increased from 13.6% to 18.5%, with China contributing 45.2% of this growth. In 2023, China's energy transition investment reached USD 676 billion, making it the world's largest investor in energy transition. China continues to expand its openness and cooperation, providing high-quality clean energy products and services globally. In 2023, China's exported wind power and photovoltaic products helped other countries reduce carbon dioxide emissions by approximately 810 million tons. China's new energy industry has not only enriched global supply and helped reduce global energy transition costs but has also made significant contributions to global green transition and addressing climate change.



China's Share in Global New Energy Capacity Additions (2019-2023)

Figure 9: China's Contribution to Global Green Transformation

Source: White Paper on "China's Energy Transition"

2. Maintaining stable global industrial and supply chains is an inevitable requirement of economic globalization

Economic globalization is an irreversible trend of development, and efficient, smooth global industrial chains require fair competition. Over the past several decades, humanity has achieved remarkable economic development and social progress. This is both an objective result of most countries adhering to the concept of peaceful development and following the historical trend of economic globalization, while also paving the correct path for countries to pursue open development and win-win cooperation.

Global industrial and supply chains are the objective result of market laws and economic globalization working in tandem. Countries engaging in division of labor based on their comparative advantages represents an important pathway for optimizing global resource allocation and a significant measure for improving production efficiency and public welfare.

In the context of economic globalization, both supply and demand are global in nature. Restricting supply-demand balance within national boundaries and ignoring comparative advantages under market economics, while equating countries' export advantages and quality products with "overcapacity," effectively denies the rationality of international division of labor and the laws of economic globalization. This contradicts the trend of deepening international cooperation and integrated development. Countries' comparative advantages should not be arbitrarily labeled as "overcapacity." Taking the automotive industry as an example: In 2023, the top nine global vehicle sales companies were Toyota, Volkswagen, Hyundai, Stellantis, General Motors, Ford, Honda, Nissan and other automotive companies from developed countries, occupying the majority of global market share.[①] However, these countries have never faced accusations of "overcapacity." In 2023, only 20% of German automobile production was sold domestically, with about 80% going to international markets. Japan exported approximately 50% of its automobile production, while

① Liu Zeran, Toyota Retains Global Sales Crown in 2023, BYD Enters Top Ten for First Time," Jiemian News, January 8, 2024, https://www.jiemian.com/article/10645823.html

China's overseas sales of new energy vehicles accounted for only 12.6% of production. Therefore, the accusations of "overcapacity" against China are groundless.[①] In 2022, U.S.-based semiconductor companies held 48% of the global semiconductor market share, the highest among all countries. In China's USD 180.5 billion semiconductor market, U.S. companies held a share of 53.4%. The U.S. similarly has not faced accusations of "overcapacity."[②]

China's new energy production capacity and export share in global capacity distribution are the result of deepening international division of labor and fair competition in global markets. China's advantages in the new energy industry are determined by full domestic market competition, continuous technological innovation, and comparative advantages with other countries. Under WTO rules, Chinese new energy enterprises expanding production capacity and global sales markets by leveraging their advantages is no different from other multinational corporations. From an export perspective, China's new energy products currently primarily serve domestic demand. In 2023, China's new energy vehicle exports accounted for only 12.6% of total production, and within this 12.6%, nearly one-third was from U.S.-based Tesla.[③] According to research by European think tank Transport & Environment (T&E), 60% of electric vehicles imported by the EU from China in 2023 were products from American and European manufacturers such as Tesla, Renault, and BMW.[④] Hyping China's new energy "overcapacity" contradicts the principles of international division of labor, free trade, and fair competition, while ignoring the important role of international trade in driving world economic growth and improving people's welfare across countries.

China consistently upholds openness and sharing, forming close industrial chain

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① China's New Energy Production Capacity Strongly Promotes Global Green Transformation and Open Development, Ministry of Commerce of the People's Republic of China, May 14, 2024, http://m.mofcom.gov.cn/article/xwfb/xwrcxw/202405/20240503509563.shtml

② Li Yan, U.S. Semiconductor Industry Association Releases 2023 Factbook White Paper, https://www.las.ac.cn/front/product/detail?id=c16f2e5012aeda8954b6c56109b4af54

③ "Tesla Shanghai Gigafactory's 2023 Deliveries Account for Over Half of Global Capacity," Xinhua News, January 4, 2024, http://www.sh.xinhuanet.com/20240104/e4375b4cb1fa424f910601cdc8106956/c.html

④ "EU's Additional Tariffs on Chinese EVs is a Double-Edged Sword," Nikkei Chinese, June 13, 2024, cn.nikkei.com/politicsaeconomy/investtrade/55859-2024-06-13-09-31-40.html

partnerships with various countries. This has promoted global industrial chain optimization and upgrading, providing crucial support for stable and smooth operation of global industrial and supply chains. On the one hand, China adheres to market economy principles and fair competition, ensuring national treatment for foreign-invested enterprises and continuously building a world-class business environment, allowing companies from all countries to fully share China's development opportunities. With the implementation of pre-establishment national treatment plus negative list system, foreign investment access in the energy sector has been fully opened except for nuclear power plants. Multinational companies such as General Electric, BP, and Siemens have steadily increased their energy investments in China. Foreign investment projects including EDF Group's offshore wind power project, Tesla's Shanghai electric vehicle manufacturing facility, and LG New Energy's Nanjing battery factory have successively established operations in China. Prior to July 2022, foreign automakers maintained over 50% market share in China, dominating the Chinese automotive market and enjoying high growth and substantial profits.[①]

On the other hand, cooperation between Chinese new energy vehicle companies and multinational corporations has further accelerated. In December 2023, BYD announced plans to build a new energy vehicle production base in Hungary. In April 2024, Chery announced plans to establish a joint venture with Spain's Ebro Company in Barcelona for electric vehicle production. European automotive giant Stellantis partnered with Zhejiang Leapmotor Technology to establish a joint venture in the Netherlands, which began sales operations in September 2024 across nine European countries including Germany and France.

3. Firmly promoting the construction of an open world economy

First, implementing trade protectionism is detrimental to world trade growth and economic recovery. The World Economic Outlook released by International Monetary Fund in October 2024 forecasts global economic growth of 3.2% in 2024,

① U.S. Media Laments End of Foreign Automakers' "Golden Age" in China: How to Compete with Chinese Companies Now? Guancha.cn, September 4, 2024, https://www.guancha.cn/internation/2024_09_04_747198.shtml?s=zwyzxw

significantly lower than the 2000-2019 average of 3.8%.[①] Against this backdrop, using "overcapacity" as a pretext to mix trade and economic issues with politics and security will further drag down global trade growth. This creates "blockages," "bottlenecks," and "breakpoints" in the global economic circulation, affecting world economic operational efficiency and potentially triggering various risks.

Second, implementing green protectionism in the new energy sector will ultimately create a lose-lose situation for all parties. According to Moody's report, while the U.S. Trump administration significantly increased tariffs on Chinese products, U.S. importers bore over 90% of the additional tariff costs on imports from China.[②] Over the past decade, China's photovoltaic industry has faced multiple suppressive measures, including anti-dumping and countervailing duties, Section 201, 301, and 337 investigations, and anti-circumvention investigations. In 2011, European and American countries began implementing anti-dumping and anti-subsidy sanctions against Chinese photovoltaic products. In 2022, the U.S. began prohibiting the export of polysilicon produced in Xinjiang and any products using Xinjiang-produced polysilicon materials to the United States. In the global photovoltaic industry chain, Europe and the U.S. have advantages in raw materials and equipment, while Chinese enterprises excel in manufacturing. Implementing trade restrictions will cause losses to upstream and downstream industries and consumers in the U.S. and Europe while risking disruption of the global photovoltaic industry chain. Research published in Nature in 2022 showed that without the global photovoltaic supply chain dominated by China, the United States would have paid an additional USD 24 billion and Germany an additional USD 7 billion for the same installed capacity between 2008-2020.[③] From 2019 to 2023, against the backdrop of European energy shortages, China's supply of high-quality, efficient, and affordable new energy products made significant contributions to Europe's renewable energy transition, benefiting European downstream users and

① World Economic Outlook, International Monetary Fund, https://www.imf.org/en/Publications/WEO/Issues/2024/10/22/world-economic-outlook-october-2024

② Xu Supei, How Unpopular are U.S. Tariffs on China, Xinhua Net, August 11, 2024

③ Helveston,John,Gang He,and Michael Davidson, Quantifying the Cost Savings of Global Solar Photovoltaic Supply Chains, Nature，Vol.612,2022.https://doi.org/10.1038/s41586-022-05316-6.

consumers.[①]

The attempt to build trade barriers against other countries' new energy industries under the pretext of "overcapacity" is likely to again harm the interests of domestic enterprises and public welfare in the concerned countries. For example, after the EU's decision to impose additional tariffs on Chinese electric vehicles starting July 2024, Tesla announced it would increase the price of its main pure electric vehicle "Model 3" in Europe from July.[②] Former EU Transport Commissioner Violeta Bulc stated that the automotive industries of EU countries and China are deeply integrated. She noted that imposing tariffs on electric vehicle imports from China would lead to further reduction in external investment in Europe, hinder innovation and development in European automotive and transportation industries and impede Europe's green transition. She advocated that the EU should cooperate with China instead.[③] Senior executives from European companies including BMW Group, Volkswagen Group, and Mercedes-Benz warned that imposing electric vehicle tariffs is a trap that won't protect Western automakers from lower-cost Chinese brands, and urged taking a longer-term view.[④] Research published in Science in 2022 demonstrated that international cooperation in the low-carbon sector poses very limited national security and economic risks. The study concluded that "decoupling" is like drinking poison to quench thirst - the risks far outweigh the returns and could harm global efforts to mitigate climate change.[⑤]

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① Jiao Yifei, Lin Run: "Interview with Zhang Sen, Secretary-General of CCCME PV Branch: Using 'Overcapacity Theory' as Suppression Means Denies China's PV Industry's Technological Innovation and Cost-Efficiency Efforts," 21st Century Business Herald, May 22, 2024, P. 006.

② Arjun Kharpal, Tesla expects to raise Model 3 prices in Europe after higher EU tariffs on China EVs, June 13, 2024,https://www.cnbc.com/2024/06/13/tesla-to-likely-raise-model-3-prices-in-europe-after-eu-tariffs-on-china-evs.html

③ Chinese Electric Vehicle Tariffs Will Backfire on European Auto Industry - Interview with Eurasian Center Vice Chair Bulc, Xinhua Net, June 13, 2024, http://www.xinhuanet.com/auto/20240613/31fe6644dbfa4b20b2894cc5dc7f10ad/c.html

④ Mercedes-Benz, BMW, Volkswagen Respond to EU's Planned Tariffs on Chinese Electric Vehicles, China News Network, June 12, 2024, http://www.chinanews.com.cn/cj/2024/06-12/10232881.shtml

⑤ Michael R Davidson, Valerie J Karplus, Joanna I Lewis, Jonas Nahm, Alex Wang, "Risks of decoupling from China on low-carbon technologies," *Science*, Vol.337, No.6612,2022, pp.1266-1269.

Excerpt from Resolution of the Central Committee of the Communist Party of China on Further Deepening Reform Comprehensively to Advance Chinese Modernization
Chapter on Pursuing High-Standard Opening Up

Opening up is a defining feature of Chinese modernization. We must remain committed to the basic state policy of opening to the outside world and continue to promote reform through opening up. Leveraging the strengths of China's enormous market, we will enhance our capacity for opening up while expanding international cooperation and develop new institutions for a higher-standard open economy.

(24) Steadily expanding institutional opening up

We will promote alignment with high-standard international economic and trade rules and harmonize rules, regulations, management, and standards relating to property rights protection, industrial subsidies, environmental standards, labor protection, government procurement, e-commerce, the financial sector, and other areas, in an effort to create an institutional environment that is transparent, stable, and predictable. We will seize the initiative by opening China's commodity, services, capital, and labor markets wider to the outside world in an orderly manner and unilaterally opening our doors wider to the world's least developed countries. We will further reform institutions and mechanisms for foreign aid to realize full-chain management.

We will safeguard the WTO-centered multilateral trading system, actively participate in the reform of global economic governance, and provide more global public goods. We will expand our globally-oriented network of high-standard free trade areas, establish compliance mechanisms that are aligned with prevailing international rules, and optimize the environment for opening up and cooperation.

(25) Deepening the foreign trade structural reform

We will better coordinate trade policies with fiscal, tax, financial, and industrial policies, create a set of systems and policies to support efforts to build China into a strong trading nation, step up reforms to integrate domestic and foreign trade, and actively respond to the trends of digital and green trade. We will develop new regulatory approaches for customs clearance, taxation, and foreign exchange and foster an institutional environment that is conducive to the development of new models and forms of trade. We will develop digital trade in an innovative manner and promote the development

of integrated pilot zones for cross-border e-commerce. We will build commodity trading centers and global distribution centers, support various types of entities in developing logistics facilities overseas in a well-ordered way, and facilitate the development of international logistics hubs, as well as hubs for the distribution of commodities and resources, in areas where conditions allow. The mechanisms for preventing and controlling trade risks will be improved, and our export control framework and trade remedy system will be refined.

We will adopt innovative measures to boost trade in services and fully apply the negative list for cross-border trade in services. We will promote comprehensive trials and demonstrations for expanding opening up of the service sector and encourage specialized service organizations to enhance their capacity for providing international services. We will work faster to promote offshore trade and develop new types of transactions in offshore international trade. We will set up sound systems for cross-border financial services and diversify the supply of financial products and services.

(26) Further reforming the management systems for inward and outbound investment

We will foster a first-rate business environment that is market-oriented, law-based, and internationalized and protect the rights and interests of foreign investors in accordance with the law. We will expand the catalog of encouraged industries for foreign investment, appropriately shorten the negative list for foreign investment, remove all market access restrictions in the manufacturing sector, and promote wider opening with regard to telecommunications, the internet, education, culture, medical services, and other sectors in a well-conceived way. We will further reform the institutions and mechanisms for promoting foreign investment, ensure national treatment for foreign-funded enterprises in terms of access to factors of production, license application, standards setting, and government procurement, and support them in collaborating with upstream and downstream enterprises in industrial chains. We will improve relevant measures to make it more convenient for people from outside the mainland to live, receive medical services, and make payments on the mainland. We will refine the institutions and mechanisms for promoting and protecting Chinese investment abroad, improve the management and service systems for outward investment, and facilitate international cooperation in industrial and supply chains.

(27)Optimizing the layout for regional opening up

We will consolidate the leading role of eastern coastal areas in our opening up endeavors, promote further opening up in the central, western, and northeastern regions, and move faster toward all-around

opening up through links running eastward and westward, across land, and over sea. To leverage the strengths of areas along the coasts, borders, rivers, and major transportation routes, we will optimize the division of functions for opening up among different regions in order to develop a diverse array of pacesetters for opening up. We will implement the strategy for upgrading pilot free trade zones and encourage these zones to engage in pioneering and integrated explorations. The development of the Hainan Free Trade Port will be accelerated.

Harnessing the institutional strengths of the One Country, Two Systems policy, we will work to consolidate and enhance Hong Kong's status as an international financial, shipping, and trade center, support Hong Kong and Macao in building themselves into international hubs for high-caliber talent, and improve relevant mechanisms to see the two regions playing a greater role in China's opening to the outside world. We will encourage cooperation between Guangdong, Hong Kong, and Macao in the Greater Bay Area by promoting closer alignment of rules and mechanisms. We will improve relevant institutions and policies to promote economic and cultural exchanges and cooperation across the Taiwan Strait and advance integrated cross-Strait development.

(28) Improving the mechanisms for high-quality cooperation under the Belt and Road Initiative

We will continue to implement the Belt and Road Science, Technology, and Innovation Cooperation Action Plan and redouble efforts to develop multilateral platforms for cooperation in green development, the digital economy, artificial intelligence, energy, taxation, finance, disaster mitigation, and other areas. We will work to improve the integrated framework for land, sea, air, and cyberspace connectivity and build a multidimensional network to connect countries along the Belt and Road. We will make coordinated efforts to advance both major signature projects and "small but beautiful" public welfare projects.

Source: Website of the Central People's Government of the People's Republic of China, https://www.gov.cn/zhengce/202407/content_6963770.htm?sid_for_share=80113_2

Third, China will unwaveringly advance high-standard opening up. Over more than 40 years of reform and opening up, China has become the major trading partner of more than 140 countries and regions. Particularly since the 18th National Congress of the CPC, China has implemented policies to expand imports through several key measures: First, China has proactively reduced tariffs, with the overall tariff level now decreased

to 7.3%, approaching the average level of developed countries. Second, the country has approved the import of 477 types of high-quality agricultural products and expanded unilateral opening up to least developed countries, promoting joint development. Additionally, China pioneered the world's first national-level import-themed exhibition, hosting the China International Import Expo for seven consecutive years, fully demonstrating China's determination to share development dividends with the world. In 2023, China's import scale reached 17.99 trillion yuan, sourcing from over 200 countries and regions worldwide. Imports of agricultural and mechanical-electrical products from least developed countries have doubled compared to 2012.[①]

The Resolution of the Central Committee of the Communist Party of China on Further Deepening Reform Comprehensively to Advance Chinese Modernization, adopted at the Third Plenary Session of the 20th CPC Central Committee, emphasizes the need to proactively align with high-standard international economic and trade rules, steadily expand institutional opening up, pursue high-standard opening up, and develop new institutions for a higher-standard open economy. China practices true multilateralism, advancing bilateral, regional, and multilateral cooperation to promote more free and convenient global flow of production factors. This approach aims to unleash the potential of global economic and trade cooperation, ensuring that the benefits of economic globalization better serve every country, jointly promoting inclusive economic globalization that benefits all.[②]

4.Global new energy industry's healthy development requires afair trade environment

The green protectionism of the US and EU reveals double standards in their new energy industrial policies. While US and EU governments continuously call for manufacturing reshoring and support green industries through subsidies, some countries even provide long-term, large-scale subsidies through legislation. For example, the US Infrastructure

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① "General Administration of Customs: China's Overall Tariff Level Has Decreased to 7.3%, Approaching the Average Level of Developed Countries," China News Network, https://interview.chinanews.com/cj/shipin/cns-d/2024/07-30/news996037.shtml

② Wu Zhicheng, Liu Peidong: "Adhering to the Direction of Inclusive Economic Globalization," Guangming Daily, https://epaper.gmw.cn/gmrb/html/2024-03/27/nbs.D110000gmrb_06.htm

Investment and Jobs Act allocated USD 7.5 billion to support electric vehicle charging infrastructure construction, while the Inflation Reduction Act provides tax credits of up to USD 7,500 for electric vehicles assembled in North America. The U.S. Treasury Department's additional guidance for the Inflation Reduction Act issued in May 2024 explicitly states that companies with over 40% domestic manufacturing content for photovoltaic products can receive subsidies, attempting to weaken or partially block international supply chains for the new energy industry through localization standards. Under these massive subsidy policies, First Solar, the largest U.S. photovoltaic company, reported net profits of USD 831 million in 2023, with USD 660 million coming from subsidies, accounting for over 80%.[①] The EU has implemented discriminatory industrial policy provisions through various initiatives including the European Green Deal and Green Industrial Plan to protect and nurture the European green capacity market. Currently, while the US and EU are implementing their own subsidy policies, they are simultaneously imposing tariffs on Chinese new energy products citing "industrial subsidies" and "overcapacity." This represents typical double standards and trade protectionism. Trade protectionism is detrimental to the healthy development of the global new energy industry; dialogue, coordination, and mutual benefit are the right path forward. In November 2024, China and the EU are negotiating automobile tariffs. Meanwhile, leaders of major EU countries such as Germany and France expressed hope for promptly resolving EU-China trade disputes through negotiations during their meetings with Chinese leaders at the 2024 G20 Summit in Brazil.

Developed countries bear historical responsibility for global climate change and should take the lead in significantly reducing emissions. They should quickly fill the annual USD 100 billion climate financing commitment gap. The 29th United Nations Climate Change Conference (COP29) passed a resolution on the New Collective Quantified Goal (NCQG) for climate finance, requiring high-income countries to increase their binding financial commitments to low-income countries to at least USD 300 billion. The NCQG was the most important negotiation focus at COP29 and the issue with the greatest disagreement among parties, requiring the longest time to resolve.

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① Dong Zitong, Li Limin, Fair Competition is the Cornerstone of Global Photovoltaic Industry Development, China Energy News, May 27, 2024, P. 001.

However, some developed countries, rather than making up for their historical shortfall in climate financing, are instead promoting green protectionism. They attempt to bind developing countries to the lower end of global value chains and restrict their green transformation efforts. This seriously impedes climate change cooperation and green development collaboration among countries worldwide, particularly "Global South" nations.

5. Promoting inclusive global green transition through open cooperation

Whether politicizing economic cooperation under the name of "de-risking" or "small yards with high fences," or weakening other countries' competitive advantages through unilateral tariffs and barriers, these actions artificially create "decoupling" and "chain breaking" in global green industries. Such practices seriously violate market rules and international trade order, threatening global industrial and supply chain stability and endangering world economic recovery and development. These practices particularly threaten the interests of "Global South" countries. These nations pursue economic development and national revitalization, and are unwilling to follow Western bloc politics and camp confrontation. Developing countries already face the challenge of promoting coordinated development between traditional industries and green industries/clean energy in addressing climate change. The Technology and Innovation Report 2023 released by the United Nations Conference on Trade and Development indicates that the international community must increase support for green technology transfer to developing countries, or global development gaps will widen. Developed countries' green technology exports jumped from approximately USD 60 billion in 2018 to over USD 156 billion in 2021. During the same period, developing countries' exports only increased from USD 57 billion to about USD 75 billion. In just three years, developing countries' share of global green technology exports dropped from over 48% to less than 33%.[①]

① The Technology and Innovation Report 2023, https://unctad.org/tir2023

Imbalance Between Developed and Developing Countries in Green Transition

The Financing for Sustainable Development Report 2023:Financing Sustainable Transformations released by the United Nations highlights a growing divide between nations. While developed countries advance in their green transformation, developing nations are increasingly lagging behind in the face of mounting challenges from multiple crises - food security, energy access, economic uncertainty, and climate change impacts. The report emphasizes the urgent need for sustainable industrial transformation to bridge this widening development gap. Only by addressing these disparities can the global community realistically achieve its ambitious climate and sustainable development objectives.

Source: United Nations Official Website, https://news.un.org/zh/story/2023/04/1116807

However, under the influence of green protectionism, the US and EU are establishing geopolitical barriers to prevent green technology transfer to developing countries. Some countries are also creating overseas investment environmental standards aimed at limiting cooperation with developing countries, weakening the institutional foundation for green technology R&D and international collaboration. The continued prevalence of protectionism not only hinders the global layout of green economy industrial chains but further exacerbates the development imbalance between developing and developed countries.

Fabricating “overcapacity” arguments and implementing green protectionism will significantly increase the costs for countries worldwide, especially “Global South” nations, in building new energy industry chains. This will delay their industrial upgrading process, slow their energy transition and green development progress, and affect the long-term development of the global new energy industry. Research shows that if countries gradually shift photovoltaic module production domestically between 2020 and 2030, production costs could increase by 20% to 30% by 2030, directly

leading to slower deployment and impacting global clean energy development.[①] This further demonstrates that in our globalized era, where prosperity and adversity are shared, countries form an interdependent, integrated community of interests. Openness, inclusiveness and win-win cooperation remain the only correct historical choice.

[①] Helveston, John, Gang He, and Michael Davidson, Quantifying the Cost Savings of Global Solar Photovoltaic Supply Chains, Nature，Vol.612,2022.https://doi.org/10.1038/s41586-022-05316-6.

China's International Contributions to the New Energy Industry

05

Conclusion

05 Conclusion

How to promote economic globalization and address global issues like climate change is crucial to the prospects of today's world economy and humanity's future. Based on international division of labor, comparative advantages, and the fundamental driving force of new technological revolution on the world economy, economic globalization is an irreversible historical trend that will continue to provide strong momentum for world economic development. Meanwhile, facing global challenges like climate change, international cooperation is clearly the natural choice and necessary path. In this sense, green development and low-carbon economy should further consolidate international consensus and unite global collective action. However, it is a matter of concern that anti-globalization phenomena such as "decoupling," "chain breaking," and "de-risking," triggered by great power competition and geopolitical conflicts, have already inhibited world economic recovery, delayed global green transformation, and weakened the foundation for international climate change cooperation. Objectively speaking, both global economic governance based on economic globalization and global climate governance aimed at addressing climate change face critical choices about their future direction. Promoting the transformation of economic globalization and pursuing an inclusive path of economic globalization is undoubtedly an urgent task facing the world today. At the same time, only by adhering to the vision of global governance characterized by extensive consultation, joint contribution, and shared benefits, and by taking practical actions to jointly build a more just and equitable global governance system, can humanity have more hope in addressing a series of global challenges,

including climate change.

Jointly building a community of all life on Earth and making the world cleaner and more beautiful represents China's major proposition for promoting global green transition, reflecting China's responsibility as a major country. In July 2024, China released the Opinions of the Central Committee of the Communist Party of China and the State Council on Accelerating the Complete Green Transition in Socio-economic Development, outlining overall requirements, working principles, and specific objectives for China's green transition, charting the course for China's green development. As the world's largest developing country, China's promotion of complete green transition in socio-economic development not only benefits its own high-quality development but also provides valuable reference and strong momentum for global green transition. China's new energy industry development will uphold the concept of building a community of life for man and nature, dedicated to promoting green cooperation and supporting global green development through practical actions, particularly in helping "Global South" countries explore feasible paths to sustainable development. In his keynote speech at the September 2024 Forum on China-Africa Cooperation (FOCAC) Beijing Summit, President Xi Jinping emphasized China's willingness to help Africa create "green growth engines" and narrow the gap in energy accessibility, adhering to the principle of common but differentiated responsibilities to jointly push for the global transition to green and low-carbon development. The Forum on China-Africa Cooperation Beijing Action Plan (2025-2027) released during the summit proposed that China will encourage enterprise investment in African renewable energy projects including solar, wind, green hydrogen, hydropower, and geothermal energy. The Plan outlines implementation of special clean energy power supply projects, provision of distributed photovoltaic storage systems for African countries, and support for China-Africa energy innovation accelerator projects. It also promotes African capacity building in global green product supply chains and advances African industrial capacity development for green and low-carbon transition.[①] Therefore,

① Forum on China-Africa Cooperation Beijing Action Plan (2025-2027), Ministry of Foreign Affairs of the People's Republic of China, September 5, 2024, https://www.fmprc.gov.cn/zyxw/202409/t20240905_11485697.shtml

China’s new energy industry development and international cooperation not only aligns with the direction of economic globalization but will also make increasingly important contributions to global green transition in development.