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迈向绿色贸易新纪元：全球绿色转型的机遇、路径与中国角色

TOWARD A NEW ERA OF GREEN TRADE: OPPORTUNITIES, PATHWAYS, AND CHINA'S ROLE IN THE GLOBAL GREEN TRANSITION

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引言

人类社会正站在一个决定未来命运的关键十字路口。气候变化，这一曾经被视为遥远的环境议题，如今已演变为全球最紧迫、影响最深远的系统性危机。它超越了国界、意识形态和发展阶段，以前所未有的广度和深度，冲击着全球的经济秩序、社会结构和政治格局。《巴黎协定》设定的1.5摄氏度温控目标，是国际社会应对气候危机的核心共识。联合国政府间气候变化专门委员会(IPCC)指出，实现这一目标是“减少气候变化对自然和人类系统风险、促进可持续发展的关键”。

然而，现实与理想之间的鸿沟正日益扩大，警钟已经敲响。世界气象组织（WMO）在其最新的《全球年度至十年期气候最新通报》中发出了严峻警告：在2024至2028年这五年间，全球年平均气温至少会有一年较工业化前水平升温1.5摄氏度的可能性为80%。这不再是未来的预测，而是正在发生的现实。气温的持续攀升，正以前所未有的频率和强度在全球范围内引发一系列连锁反应。

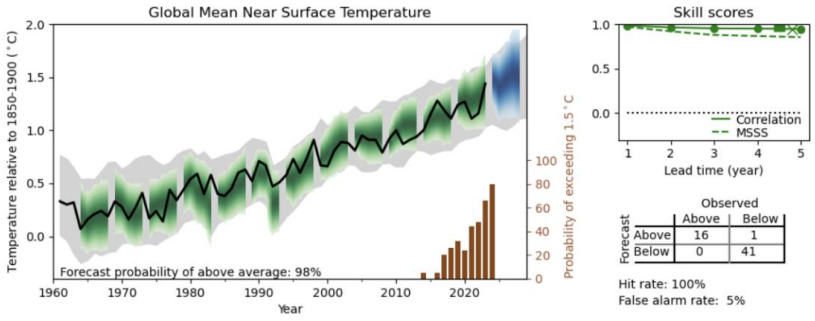


图 1 全球平均近地表温度演变与 1.5 ° C 升温风险预测

注: 该图表由世界气象组织发布, 展示了未来五年全球近地表温度相对于 1991–2020 年平均值的预报偏差。红色区域表示温度将显著高于历史平均水平, 直观地揭示了全球变暖的持续和加剧趋势。

极端天气事件,例如席卷大陆的热浪,摧毁家园的超级风暴,以及可能引发粮食危机的特大干旱和洪水已成为如今世界“新常态”。这些灾害不仅直接威胁人类生命安全,更对全球经济造成了沉重打击。世界银行在其报告中估算,若不采取紧急行动,到 2050 年,气候变化造成的经济损失每年可能高达数万亿美元。在这场危机中,发展中国家因普遍缺乏应对所需的资金、技术和基础设施,正面临着更为严峻的生存与发展困境。

面对这一关乎人类共同命运的全球性挑战,一场深刻的、系统的绿色革命已成为我们目前必须选择的道路,其转型涵盖能源结构、产业模式、技术路径乃至生活方式等全方面内容。然而,这场革命的实现毋庸置疑需要大量的投资:国际能源署(IEA)在其《世界能源投资报告》中明确指出,为了实现全球净零排放的目标,全球每年在清洁能源领域的投资额需要在 2030 年前达

到 4.5 万亿美元的规模。尽管 2023 年全球清洁能源投资达到了创纪录的 1.8 万亿美元，但这与所需水平相比，仍然存在超过 2.7 万亿美元的巨大年度资金缺口，这凸显了目前对高成本效益产品、先进技术和有效资源配置的迫切需求。

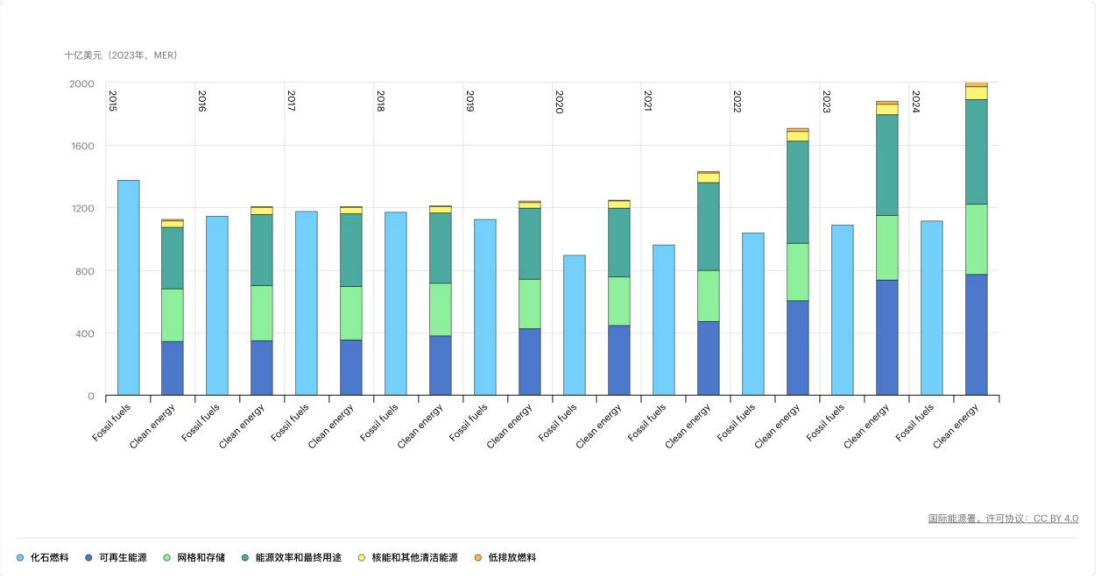


图 2 2015-2024 年全球能源投资结构

注：该图表源自国际能源署（IEA）的权威数据，系统地展示了自 2015 年至 2024 年（预估值）全球能源投资的结构性演变。

在此需求背景下，绿色贸易（Green Trade）[①]，作为协调环境可持续性与经济增长的核心纽带，已经从国际贸易的边缘议题，一跃成为重构全球经贸规则、驱动全球治理变革的前沿和核心。随着太阳能电池板、风力发电设备、新能源汽车和储能技术等绿色产品在国际市场上的交换日益频繁，相关产业得以突破地域限

① 联合国相关机构政策文件中，绿色贸易主要指环境与贸易协调，《21 世纪议程》《里约环境与发展宣言》《可持续发展问题世界首脑会议的报告》《全球可持续发展报告》等文件中，均强调贸易与环境相辅相成、相互协调、相互促进。2021 年，联合国环境规划署发布《绿色国际贸易：前进道路》，多次提及绿色贸易，并提出构建环境与贸易 2.0 议程，包括加强与贸易相关的环境政策、在贸易政策和协定中推动环境规制升级、推进环境与贸易相关合作等。欧盟《适应气候变化：迈向欧洲行动框架》等政策文件关注绿色贸易，其中的绿色贸易主要有两层含义，即绿色贸易措施和绿色产品贸易。

制，在全球范围内形成更高效的资源配置格局。同时，国际市场的竞争压力与规模化生产也加速了绿色技术成本的下降，使其在不同发展阶段的国家中更具可及性。此外，绿色贸易还促成了跨国企业与机构之间的技术协作和产业链对接，为绿色技术的创新扩散提供了新的动力来源，逐步形成支撑全球绿色转型的合作网络。

近年来，全球绿色贸易的发展势头异常强劲，展现出巨大的市场潜力和发展韧性。根据世界贸易组织（WTO）与国际能源署（IEA）的联合统计，2024 年，全球国际绿色贸易的规模已历史性地达到 5 万亿美元，相较于 2020 年实现了 85%的惊人增长，在全球货物与服务贸易总额中的占比已攀升至 18%。这一数字的背后，是全球对绿色、低碳、可持续发展模式的普遍共识和坚定选择。

在这一波澜壮阔的全球绿色转型浪潮中，世界格局正在发生深刻变化，中国也正在经历从“参与者”到“重要贡献者”和“积极引领者”的历史性转变。中国凭借其在可再生能源、新能源汽车等领域的全产业链优势，不仅为自身的绿色发展提供了坚实基础，也为全球市场提供了大量高品质、高性价比的绿色产品，有力地推动了全球能源转型的进程，并显著降低了全球的减排成本。一个以绿色贸易为核心驱动力的新纪元正在开启，其机遇、挑战以及其中蕴含的深刻变革，值得我们进行全面而深入的审视与探讨。

第一章 全球绿色贸易发展现状与趋势

在全球应对气候变化、追求可持续发展的宏大叙事背景下，绿色贸易已经从一个相对边缘的专业领域，演变为驱动全球经济转型、重塑国际竞争格局的核心力量。它不仅代表着新的经济增长点，更承载着实现《巴黎协定》目标、构建人类命运共同体的关键路径。本章将系统性地描绘全球绿色贸易的演进脉络、市场全景，并剖析其背后的核心驱动机制。

一、绿色贸易的兴起与内涵演变

绿色贸易的崛起并非一蹴而就，而是伴随着全球对环境与发展关系的认知深化而逐步形成的。其思想源头、内涵边界与全球地位均经历了深刻的演进过程。

（一）理论溯源：从可持续发展到全球共识

绿色贸易的理论基石是“可持续发展”理念。这一概念于1987年由世界环境与发展委员会（WCED）在《我们共同的未来》报告中首次提出，其经典定义为“既能满足当代人的需求，又不对后代人满足其需求的能力构成危害的发展模式”。这标志着人类发展观的一次革命性飞跃，首次将代际公平和环境承载力置于发展的核心考量之中。

1992年的联合国环境与发展大会（里约地球峰会）是这一理

念转化为全球行动的里程碑。会议通过的《21 世纪议程》为全球可持续发展制定了行动框架，明确承认了贸易在实现可持续发展目标中的双重作用：一方面，无序的贸易活动可能加剧环境退化和资源枯竭；另一方面，开放、公平、非歧视的多边贸易体制，能够通过优化资源配置、传播环保技术，成为推动可持续发展的有力工具。自此，“贸易与环境”成为国际政策议程中的一个常设议题。

进入 21 世纪，特别是 2015 年联合国《2030 年可持续发展议程》和《巴黎协定》的相继达成，为绿色贸易的发展注入了前所未有的政治动力。这两份历史性文件构建了全球应对气候变化和实现可持续发展的顶层法律与政策框架，将减排、适应和资金支持等承诺具体化。在这一框架下，绿色贸易不再仅仅被视为环境保护的辅助手段，而是被提升到实现国家自主贡献承诺（NDCs）、加速全球能源转型和构建绿色低碳经济体系的战略高度。

（二）内涵界定与范畴扩展

随着实践的深入，绿色贸易的内涵与外延也在不断扩展，形成了一个多元化、立体化的体系。

第一阶段：聚焦“环境产品”。最初，绿色贸易的核心概念较为狭窄，主要指由经济合作与发展组织（OECD）和亚太经合组织（APEC）等定义的“环境产品”。这些产品主要用于环境监测、污染防治和资源管理，例如废水过滤装置、空气净化设备、废弃

物回收系统等。这一阶段的政策讨论也主要集中在削减这些特定产品的关税壁垒上

第二阶段：扩展至“绿色服务”与“绿色技术”。随着全球经济向服务化转型，人们认识到，仅有硬件产品是远远不够的。绿色服务贸易应运而生，它包括为支持环境目标而进行的跨境服务，如环境影响评估、碳审计与咨询、绿色建筑设计、可再生能源项目工程总承包（EPC）、绿色金融与保险等。这些高附加值的服务贸易，对于绿色项目的落地和高效运营至关重要。同时，绿色技术贸易也超越了产品本身，包含了环保专利的许可、专有技术的转让、低碳工艺流程的授权等，成为技术扩散和创新的关键渠道。

第三阶段：迈向“全产业链绿色化”。当前，绿色贸易的内涵已经进入了 3.0 时代，其核心理念是推动全球价值链（GVCs）的整体绿色化。这不仅关注最终产品是否“绿色”，更强调其生产、运输、消费、回收的全生命周期是否符合可持续标准。在这一理念下，循环经济产品（如再制造零部件、再生原材料）、可持续采购的农林产品、具有可追溯碳足迹的消费品等，都被纳入了广义的绿色贸易范畴。这一阶段的重点是从单纯的产品贸易，转向构建一个闭环的、可持续的全球生产与消费体系。

（三）全球地位变迁：从边缘到核心

伴随着内涵的不断丰富，绿色贸易在全球经贸格局中的地位

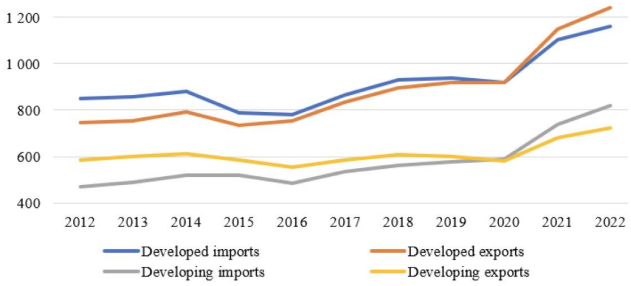
也实现了历史性的跨越。在20世纪末，它主要被视为贸易自由化进程中需要处理的“外部性”问题，而今天，它已经成为重塑全球经贸规则、引领国际经济合作的核心议题。在世界贸易组织（WTO）的部长级会议、二十国集团（G20）峰会以及各大区域贸易协定的谈判中，绿色贸易和可持续发展章节已成为不可或缺的核心组成部分。正如本报告引言所述，其高达5万亿美元的市场规模和占全球贸易总额18%的比重已经充分证明了绿色贸易现在从昔日的“配角”，成长为了驱动全球经济增长与绿色转型并行的“双引擎”之一。

二、全球绿色贸易的规模、结构与区域格局

全球绿色贸易正以前所未有的速度和规模扩张，展现出强大的市场活力和结构性演变特征。

（一）市场规模与增长态势

近年来，全球绿色贸易的增长势头极为迅猛，其增速远超同期全球货物与服务贸易的总体增速，显示出强大的抗周期性和内生增长动力。根据联合国贸易和发展会议（UNCTAD）的统计，最新可得数据表明，全球环境产品贸易额在2022年已接近2万亿美元，创历史新高。这一趋势的背后，是全球对绿色转型投资的持续加码。



Source: UNCTAD calculations based on the UN Comtrade Database. Data for 2022 are preliminary.

图 3 《2012 – 2022 年全球环境产品贸易额（十亿美元）》

资料来源：联合国贸易和发展会议（UNCTAD）①

（二）贸易结构深度剖析

在 5 万亿美元的庞大市场中，内部结构也呈现出多元化特征，反映了全球绿色转型的不同侧面。

绿色产品贸易（占比约 60%）：这是绿色贸易的基石和主体。其中，以电动汽车、锂电池、太阳能电池为代表的“新三样”产品贸易表现最为抢眼，成为拉动增长的核心引擎。此外，风力发电机组、储能系统、节能家电、环保材料等产品的贸易额也持续攀升。

绿色服务贸易（占比约 25%）：这是一个快速增长且附加值更高的领域。随着全球绿色项目投资的增加，对跨境的绿色金融、技术咨询、工程设计、认证服务和风险管理的需求日益旺盛。

碳贸易（占比约 15%）：随着全球及区域性碳定价机制的完善（如欧盟碳排放交易体系 EU-ETS），碳配额和碳信用的跨境交易日益活跃，成为一种新兴的、以环境容量为标的的大宗商品

① United Nations Conference on Trade and Development (UNCTAD). International Trade and Development 2023: Report of the Secretary-General (A/78/230) [EB/OL]. [2025-11-26]. https://unctad.org/system/files/official-document/a78d230_en.pdf.

贸易，其市场规模和金融属性正不断增强。

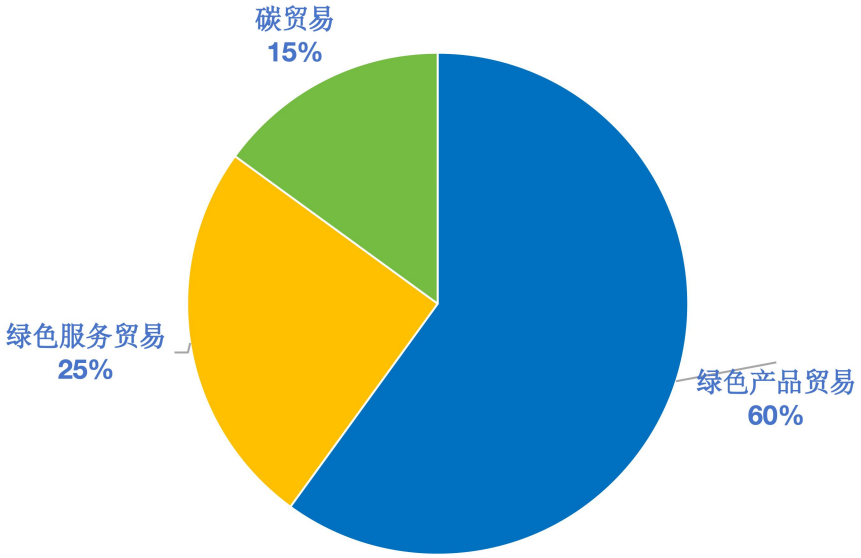


图 4 2024 年全球国际绿色贸易结构

资料来源：　世界贸易组织(WTO)、国际能源署(IEA)

（三）区域格局与贸易流向

当前，全球绿色贸易的地理格局呈现出“三足鼎立”的基本特征，即欧盟、北美和东亚构成了全球绿色贸易的核心枢纽。但这三大区域的角色定位和优势各不相同，形成了复杂的竞争与合作关系。

1.欧盟：规则的制定者与高端市场的引领者

凭借其《欧洲绿色新政》的强力推动，欧盟在绿色贸易领域扮演着全球“规则引领者”的角色。其推出的碳边境调节机制（CBAM）、电池新法、可持续产品生态设计指令（ESPR）等一系

列法规为全球绿色贸易的标准和门槛设定作出了贡献，与此同时，欧盟本身也是高端绿色技术、产品和服务的巨大消费市场。

2.北美（主要是美国）：政策驱动的内需市场与技术创新高地

美国通过《通胀削减法案》（IRA）等大规模产业政策，以巨额补贴和税收抵免刺激国内清洁能源制造业和新能源汽车市场，创造了巨大的本土需求。同时，美国在绿色技术的前沿研发和创新领域（如下一代储能、氢能、碳捕捉技术）仍保持着全球领先地位。

3.东亚（以中国为核心）：全球绿色制造中心与关键供应链枢纽

东亚地区，尤其是中国，凭借其强大的制造业基础、完整的产业链配套和巨大的规模经济效应，已成为全球最重要的绿色产品制造和供应基地之一。从太阳能光伏板到动力电池，再到风力发电机，中国在全球中游制造环节占据着主导地位，并正在快速向研发设计和品牌营销等价值链两端延伸。

贸易流向上，已经从过去单一的“发达国家向发展中国家出口环保设备”的模式，演变为更加复杂多元的多向流动。例如，中国向全球出口光伏组件和电动汽车，欧盟向中国出口高端制造装备和环保技术，美国则在吸引全球的绿色投资。同时，发展中国家内部的“南南绿色贸易”也在兴起，前景广阔。

第二章 绿色贸易自由化的机遇与挑战

推动绿色贸易自由化，即系统性地削减和消除针对绿色产品、服务和技术的关税与非关税壁垒，已成为全球应对气候危机、实现可持续发展目标的关键路径。然而，这条道路并非坦途。巨大的机遇背后仍潜藏着深刻的结构性障碍与日益复杂的政治经济博弈。本章将从机遇与挑战两个维度，深度剖析绿色贸易自由化的双重面貌。

一、机遇：释放全球绿色转型潜力的加速器

绿色贸易自由化，本质上是通过发挥市场在资源配置中的决定性作用，以最高效、最低成本的方式，加速绿色技术和解决方案在全球范围内的普及与应用。

（一）降低全球绿色转型成本，加速技术普及

绿色转型的核心，是用清洁、低碳的技术和产品替代高耗能、高排放的传统体系。然而，高昂的初始成本，尤其是对于资金和技术实力相对薄弱的发展中国家而言，是阻碍转型步伐的主要障碍。绿色贸易自由化恰恰是破解这一难题的利器。

根据经济合作与发展组织（OECD）的测算，全球范围内针对环境产品的关税虽然平均水平不高，但在某些关键产品和部分国家，关税峰值可高达35%以上。而非关税壁垒，如繁复的认证程

序、歧视性的技术标准等，其造成的隐性成本甚至更高。因此，这些壁垒的消除能够产生积极的经济效益。

一是直接降低产品价格。削减关税将直接降低进口太阳能电池板、风力发电机、节能设备等关键产品的成本，使得可再生能源项目和节能改造在更多国家具备商业可行性。世界银行的一项研究表明，全面取消环境产品的贸易壁垒，可使相关产品贸易额增长超过15%，并显著降低各国的减排履约成本。

二是促进规模经济：一个开放、统一的全球大市场，有助于领先的绿色企业依托大规模生产进一步摊薄研发与制造成本，并沿着“学习曲线”推动价格持续下降。这正是过去十年光伏和风电成本显著降低的关键驱动力之一。

三是赋能发展中国家：对于绝大多数发展中国家而言，它们是绿色技术的“净进口国”。贸易自由化意味着它们能够以更低的价格，获取应对气候变化所需的先进技术和设备，从而跨越传统的高碳发展路径，实现跨越式、可持续的发展。

（二）促进全球绿色创新与产业升级

开放的贸易环境是激发创新的最佳催化剂。绿色贸易自由化通过引入国际竞争，能够有效打破国内市场的垄断和惰性，倒逼企业不断进行技术创新、提升能源效率、优化生产流程，进而升整个产业的绿色竞争力和附加值。

同时，它促进了全球绿色价值链（Green Value Chains, GVCs）

的形成与深化。以新能源汽车的动力电池产业为例，其价值链已高度全球化：上游的锂、钴、镍等关键矿产来自澳大利亚、智利和刚果（金）；中游的正负极材料、电解液和隔膜可能在日本、韩国和中国生产；最终的电池电芯组装和集成则遍布全球主要汽车市场。这种全球分工协作，使得各国能够专注于自身最具比较优势的环节，通过知识和技术的外溢效应，共同推动电池能量密度、安全性和成本控制等核心技术的快速迭代。

（三）创造大规模绿色就业与新兴市场

绿色转型不仅是环境议题，更是驱动新一轮经济增长和就业创造的强大引擎。绿色贸易自由化是点燃这一引擎的关键。

其一，创造绿色就业岗位。根据国际可再生能源署（IRENA）的最新报告，全球可再生能源领域的就业人数在2023年已达到1620万人[①],2023年至2030年，全球可再生能源相关行业就业岗位将持续增长。贸易自由化通过扩大可再生能源设备的全球市场，直接支撑了这些岗位的持续增长。

① IRENA. Renewable Energy and Jobs Annual Review 2024. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Oct/IRENA_Renewable_energy_and_jobs_2024.pdf.

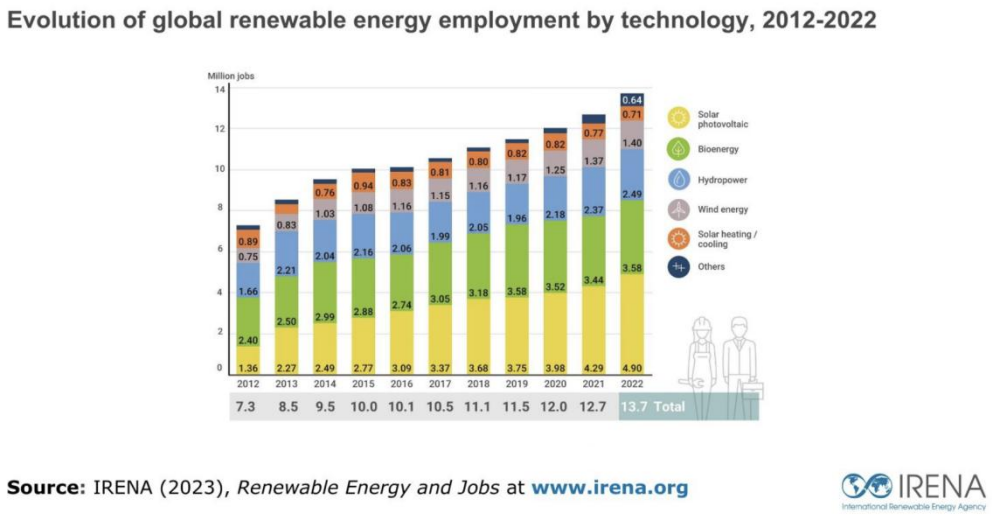


图 5 2012—2022 年全球可再生能源就业结构

资料来源：国际可再生能源署(IRENA).《可再生能源与就业》报告。①

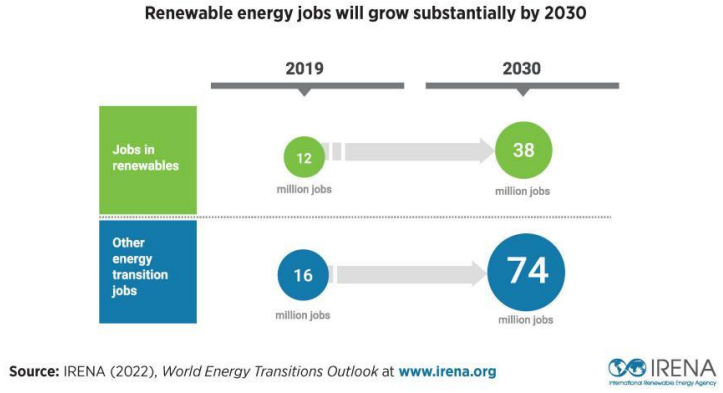


图 6 到 2030 年全球可再生能源相关行业就业岗位的预期增长

资料来源：国际可再生能源署(IRENA).《世界能源转型展望 2022 》报告。②

其二，催生万亿级新兴市场。绿色贸易自由化为一系列前沿绿色产业的商业化和全球化铺平了道路。根据彭博新能源财经

① International Renewable Energy Agency; International Labour Organization. Renewable Energy and Jobs: Annual Review
2023 [EB/OL].[2025-11-26]. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Sep/IRENA_Renewable_energy_and_jobs_2023.pdf.

② International Renewable Energy Agency. World Energy Transitions Outlook 2022: 1.5°C Pathway [EB/OL]. [2025-11-26]. https://www.irena.org/Digital-Report/World-Energy-Transitions-Outlook-2022.

（BNEF）《2025 年能源转型投资趋势》报告，全球能源转型投资持续增长，2024 年，全球能源转型投资达到 2.08 万亿美元；2025 年至 2030 年，年均能源转型投资需达到 5.6 万亿美元，2030 年后投资需求将迅速上升。[①]这将在全球范围内催生出包括绿色氢能、长时储能、可持续航空燃料、直接空气碳捕捉（DAC）、智能电网等多个万亿级别的庞大新兴市场。一个开放、非歧视的贸易投资环境，是这些新兴市场能够吸引全球资本、形成统一技术标准、快速成长壮大的根本前提。

二、挑战：逆全球化背景下的贸易保护主义与治理机制困境

尽管绿色贸易自由化是推动全球经济绿色转型的关键动力，但当前国际贸易环境正经历深刻调整。受地缘政治紧张局势、全球供应链重构以及多边贸易体制式微等多重因素影响，绿色贸易发展面临严峻的结构性挑战。一种以“国家安全”和“本国产业优先”为导向的“绿色保护主义”倾向日益显著，这对全球绿色资源的优化配置构成了实质性阻碍。

（一）逆全球化趋势加剧，供应链本土化推高转型成本

近年来，全球经贸格局呈现出明显的“逆全球化”特征。根据世界贸易组织发布的《贸易政策审议机制年度贸易监测报告》，

① 全球能源转型投资七大趋势. https://epaper.cnpc.com.cn/sysb/2025-03/23/con-34651.html.

2009 年以来全球进口限制措施所覆盖的贸易额及其占全球进口比重均呈现上升趋势。图 7 中蓝色柱状代表受影响的贸易规模，绿色折线显示其占全球进口的比例，反映了近十多年全球贸易保护主义持续上升、进口限制不断累积的趋势。

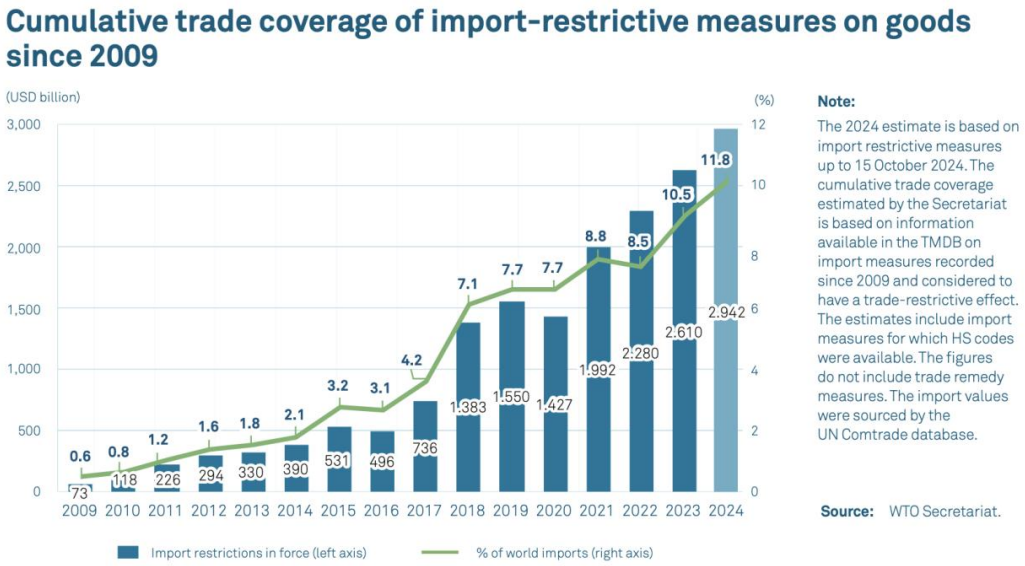


图 7 2009 年以来全球进口限制措施涉及贸易额及其占世界进口比重（WTO）

资料来源：WTO《贸易政策审议机制年度贸易监测报告》配套事实清单[①]

1.供应链割裂导致成本攀升

新能源产业（如光伏、风电及电动汽车）具有高度全球化的产业链特征。然而，部分发达经济体出于减少对外依赖的考量，通过行政手段强推“制造业回流”或“近岸外包”。这种违背比

① World Trade Organization. WTO Trade Monitoring Report – Factsheet: Cumulative trade coverage of import-restrictive measures on goods since 2009 [EB/OL]. (2024-11) [2025-11-26].https://www.wto.org/english/news_e/news24_e/trdev_13nov24_e.htm.

较优势原则的做法人为切断了原有的高效分工体系，导致关键原材料（如锂、钴、镍等关键矿产）及核心零部件的跨国配置受阻。供应链的非市场化重组不仅降低了生产效率，更直接推高了绿色产品和技术的应用成本，延缓了全球特别是发展中国家的绿色转型进程。

2.市场碎片化削弱规模效应

全球市场的分割使得绿色企业难以利用全球统一大市场实现规模经济。当各国纷纷构建独立的产业闭环，重复建设现象严重，使得原本可以通过全球贸易分摊的研发与制造成本居高不下，不利于绿色技术的快速普及。

（二）“绿色壁垒”形式泛化，贸易救济与产业政策存在滥用风险

在关税壁垒逐步降低的背景下，非关税壁垒（NTBs）及国内规制措施正成为阻碍绿色贸易的主要因素。同时，部分国家将气候政策与贸易工具深度绑定，引发了关于“绿色保护主义”的广泛争议。

1.技术性贸易壁垒（TBT）的隐性门槛

部分发达国家凭借技术先发优势，制定了繁复且缺乏国际通用性的环境标准、碳足迹核算规则及合格评定程序。这些标准往往未充分考虑不同发展阶段国家的实际能力，且缺乏透明度和互

认机制。对于发展中国家企业而言，这种合规成本的不对称增加，构成了事实上的市场准入障碍，限制了其参与全球绿色价值链的机会。

2.歧视性补贴政策扭曲公平竞争

以美国《通胀削减法案》（IRA）和欧盟“碳边境调节机制”（CBAM）为代表的新型政策工具，虽然宣称旨在应对气候变化，但其实施细节引发了对贸易公平性的担忧。

补贴的排他性：例如，IRA 在提供新能源汽车税收抵免时，设定了严格的“本地含量要求”（Local Content Requirements），规定电池组件及关键矿物必须有一定比例来自北美或特定贸易伙伴。这种做法涉嫌违反 WTO 的国民待遇原则，迫使全球企业为获取补贴而扭曲正常的投资布局，导致全球产业资本的低效流动。

单边碳关税的争议：CBAM 作为一种单边措施，在缺乏全球统一碳定价机制的前提下，可能对碳市场尚不完善的发展中国家出口产品造成不公平打击，进而引发贸易报复风险。

（三）技术交流受限，全球绿色创新合作面临阻滞

技术创新是绿色发展的核心驱动力。然而，当前国际技术合作环境趋于复杂，知识和技术的自由流动受到地缘政治因素的显著干扰。

一是关键技术出口管制常态化：部分国家泛化“国家安全”

概念，对涉及新能源和低碳转型的关键技术（如高端芯片、EDA软件、先进制造设备等）实施严格的出口管制和投资审查。这种做法阻断了技术外溢渠道，迫使后发国家在技术真空中进行重复研发，降低了全球绿色创新的整体效率。

二是知识产权保护与技术扩散的矛盾。在绿色技术领域，知识产权保护与技术普及之间的平衡更加脆弱。严苛的技术封锁和知识产权争端，限制了发展中国家获取先进适用技术的途径，导致全球在应对气候变化这一共同挑战时，出现了技术层面的“南北鸿沟”。

（四）多边贸易体制功能弱化，区域治理机制难以完全替代

全球绿色贸易的健康发展需要强有力的多边规则支撑，但当前的全球经济治理体系面临严峻考验。

一是WTO机制的有效性受损。世界贸易组织（WTO）在处理现代绿色贸易争端方面显现出局限性。一方面，争端解决机制特别是上诉机构的停摆，使得成员国之间的贸易纠纷难以得到具有法律约束力的裁决，助长了单边主义措施的实施；另一方面，多边贸易规则更新滞后，针对环境补贴、碳税边界调整等新兴议题的《环境产品协定》（EGA）谈判进展缓慢，导致国际社会缺乏统一的规则指引。

二是**区域贸易协定的局限性。**随着多边机制受阻，各国转向寻求区域合作。尽管《区域全面经济伙伴关系协定》（RCEP）和

《全面与进步跨太平洋伙伴关系协定》（CPTPP）等区域协定在降低区域内关税、促进绿色投资方面发挥了积极作用，但其局限性依然明显。区域协定难以形成覆盖全球的统一标准（如统一的碳核算体系），不同区域规则的差异可能导致全球市场进一步碎片化。此外，区域合作往往侧重于成员国利益，难以像多边机制那样系统性地解决全球公共产品供给不足的问题。

第三章 中国在绿色贸易中的角色与实践

在全球绿色转型的宏大棋局中，中国的角色正在经历一场深刻的历史性嬗变。昔日的“世界工厂”，曾一度是高耗能、高排放的代名词，如今正以惊人的速度和决心，向全球绿色创新的策源地、绿色产品的核心供给方和绿色治理的积极参与者转型。这一转型不仅进一步塑造了中国自身的经济结构与发展路径，更在全球范围内，对绿色贸易的格局、成本和未来走向产生了决定性的影响。本章将深度解析中国在这一伟大转型中的角色与实践。

一、中国绿色贸易政策体系与绿色贸易实践

中国的绿色贸易发展，根植于强大的国家战略引领和一套日趋完善的政策支持体系，并在一系列国内外实践中取得了瞩目的成就。

（一）完善的政策体系：从顶层设计到具体实践

中国作为全球第二大经济体和第一大货物贸易国，已将绿色发展提升为国家核心战略，并围绕这一战略构建了较为完善的绿色贸易政策体系。

在顶层设计层面，中国先后出台了《关于推进贸易高质量发展的指导意见》、《对外投资合作绿色发展工作指引》等纲领性政策文件，明确要求将绿色理念全面融入贸易与投资的全流程，

为绿色贸易的发展确立了高层级的战略导向。

在具体执行层面，政策工具日益精准和有力。特别是2025年最新印发的《节能降碳中央预算内投资专项管理办法》，明确提出对重点行业领域的节能降碳项目、循环经济助力降碳项目等提供直接的中央财政资金支持。这清晰地体现了中国通过公共投资这一强有力工具，来引导和加速全社会绿色转型的决心与路径。

在统计监测层面，中国正着力补齐绿色贸易“度量衡”的短板。2025年10月最新出台的《商务部关于拓展绿色贸易的实施意见》中，明确提出要“研究建立并持续完善绿色贸易统计监测分析体系”，并要“探索绿色贸易有关统计监测分析实践”。这标志着中国的绿色贸易政策，正在从宏观的产业促进，迈向更精细化、数据驱动的治理新阶段。

（二）积极的国际合作：在多边平台推动绿色议程

中国深知，绿色贸易的发展离不开开放的多边合作环境。因此，中国在国际合作层面扮演着积极的建设者和贡献者角色。

在多边谈判中，中国不仅是WTO环境产品协定（EGA）谈判的重要参与方，也在亚太经合组织（APEC）、金砖国家等多边和诸边机制中，一贯倡导和推动绿色贸易自由化议程，反对各种形式的绿色保护主义。

在平台建设上，中国通过持续举办进博会、虹桥国际经济论坛等国际性顶级展会与论坛，为全球最前沿的绿色产品和技术提

供了世界级的展示与交流高端平台。特别是在第八届虹桥论坛中，“开放发展”板块进一步聚焦“绿色和可持续发展”，将绿色贸易、气候合作等设为核心议题，这再次彰显了中国致力于推动全球绿色合作的开放姿态和坚定意愿。

（三）显著的实践进展：从产品出口到方案输出

尽管面临着复杂的国际规则环境和日益增多的贸易壁垒，中国在绿色贸易领域依然取得了举世瞩目的进展，并积累了丰富的数据和成功案例。

从中国绿色贸易的成绩单看，其最显著的特征是从单一产品出口，向全供应链绿色化和集成解决方案输出的全面升级。

表 1 中国主要绿色产品、绿色服务及产业基础的 2024 年发展总体情况

主要领域	具体类别与代表	2024 年表现与规模	数据来源 / 备注
绿色产品	**绿色能源** • 风电组件 • 光伏产品 • 锂电池	• 风电设备及组件出口额同比增长 71.9% • 光伏产品出口额已连续 4 年超过 2000 亿元 • 锂电池出口 39.1 亿个，创历史	中国海关总署、行业公开报告。表明中国在绿色能源供应链上的显著优势。

主要领域	具体类别与代表	2024 年表现与规模	数据来源 / 备注
		新高	
	绿色交通 • 电动汽车 • 电动两轮车	• 电动汽车出口量首次突破 200 万辆 • 电动摩托车、自行车出口值首次突破 400 亿元	中国汽车工业协会、中国海关总署。反映全球绿色出行需求的爆发式增长。
绿色服务	**环境权益交易** • 绿色电力证书（绿证）	• 全年绿证交易量达 4.46 亿个（同比激增 364%） • 截至 2024 年底累计核发 49.55 亿个 • 获 RE100 等国际机构认可	国家能源局。绿证是市场化环境权益服务的核心代表，服务外向型供应链减排。
	对外绿色合作 • 对外直接投资 • 对外工程承包	• 在节能环保、清洁能源领域对外直接投资 25.5 亿美元 •对外承包工程节能环保清洁类项目新签合同额接近 500 亿美元，占比超过 18%	商务部。体现中国从产品输出向“产品 + 服务 + 解决方案”的全面升级。
	环保产业服务 • 技术研发、咨询、	• 中国环保产业年营业收入已连续三年超过 2.2 万亿元	中国环保产业协会。庞大的产业规模是支撑绿色服

主要领域	具体类别与代表	2024 年表现与规模	数据来源 / 备注
	运营等		务发展的坚实基础。
产业基础	**绿色制造体系** • 绿色工厂与园区	• 累计培育国家绿色工厂 6430 家、绿色工业园区 491 家 • 国家绿色工厂产值占全国比重突破 20%	工业和信息化部。强大的绿色制造基础是绿色贸易与绿色服务的源头保障。

在产品出口上，增长势头强劲。根据最新数据，2025 年前三季度，风力发电机组及零件出口增长了 23.9%[①]；光伏产品出口额已连续四年突破 2000 亿元人民币。[②]

在解决方案上，中国企业已不再仅仅是出口标准化的产品，而是越来越多地提供包含绿色金融、技术咨询、工程建设和后期运维在内的“绿色产品+绿色服务”生态系统，实现了从单一价值环节向价值链整合者的战略升级。

① 国新办举行新闻发布会 介绍 2025 年前三季度进出口情况. https://www.cccme.org.cn/news/details.aspx?id=E1B9D156135A80B97AD4288B1AF54A50&classid=8C92359A9456952E&xgid=F868932F64EB7AAF.

② https://paper.people.com.cn/zgnyb/pc/content/202502/17/content_30058311.html.

（四）对全球的实质性贡献：不止于产品

中国对全球绿色转型的贡献，远不止于提供物美价廉的产品，其影响是深远和多维的。

其一，中国是全球绿色转型成本的“稳定器”和“降低器”。据国际可再生能源署（IRENA）测算，过去十年，全球光伏发电的度电成本下降了近90%，其中超过60%的贡献可归因于以中国为核心的全球光伏产业链的技术进步和规模化生产。中国制造，使得清洁能源在全球范围内以前所未有的速度实现了平价上网，极大地降低了全球实现碳中和的经济成本。

其二，中国是发展中国家的“赋能者”。中国不仅向发达国家出口，也向广大“全球南方”国家提供了大量可负担的绿色技术和产品。在“一带一路”倡议下，中国企业在沿线国家建设了大量光伏电站、风电场和水电站，帮助这些国家构建现代化的清洁能源体系，实现了经济发展与环境保护的协同。

三是中国实现从“产品输出”到“解决方案输出”转变。中国企业正在从单纯的产品供应商，升级为提供“投融资+技术+设备+工程+运维”一揽子解决方案的系统集成商。这种模式，有效解决了许多发展中国家面临的资金、技术和管理能力不足的问题，加速了绿色项目的落地。

二、中国绿色产业优势与挑战

中国的绿色贸易成就，建立在其强大的产业优势之上。但与

此同时，内外挑战依然严峻。

（一）全球领先的竞争优势

经过多年发展，中国已在多个关键绿色产业领域，形成了难以撼动的全球竞争优势。

在可再生能源领域，中国光伏产业在全球市场份额超过80%，从多晶硅到组件的全产业链均占据主导地位；风力发电设备制造能力居世界首位，特别是在大容量机组的研发和制造上屡创世界纪录。这一优势的核心，在于中国打造了一个技术上自我迭代、成本上持续探底的闭环生态。在光伏领域，中国的支配地位体现在全产业链的协同上：从上游的高纯晶硅到技术迭代最快的中游电池片（全球份额均超 95%），再到终端组件，形成了强大的垂直整合能力。这使得中国能迅速将实验室中的 N 型高效电池技术规模化量产，成为过去十年全球光伏度电成本下降近九成的核心引擎。在风电领域，中国则实现了从追赶到超越。除了在陆上风电市场凭借规模和成本占据优势外，更在技术壁垒更高的海上风电领域屡创佳绩。其标志便是在风机“大型化”竞赛中的惊人速度，主流机型已从 5-8MW 级别快速跃升至 16-18MW 级别，这背后是中国在超百米级叶片、高扭矩齿轮箱等全产业链关键环节上取得的系统性突破，正在重塑全球可再生能源的成本曲线。

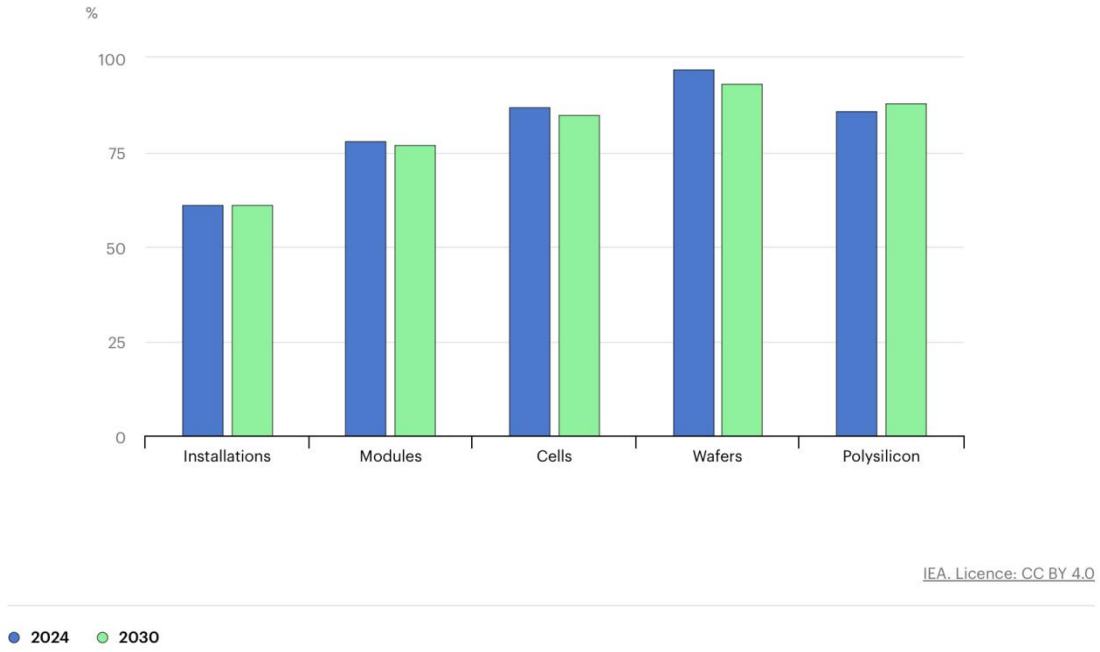


图 8 中国在全球太阳能光伏供应链各环节的产能份额（2024 年及 2030 年预测）

资料来源：国际能源署（IEA）①

在新能源汽车领域，中国已成为全球最大的生产和消费市场，更重要的是，其产业链完整度全球领先，尤其是在动力电池领域，构建了从上游材料到电芯制造再到回收利用的闭环生态。中国新能源汽车的崛起，其真正的“护城河”在于构建了一个韧性最强、效率最高的产业链生态，“动力电池”作为该生态的“心脏”正是中国优势的集中体现。中国不仅诞生了宁德时代、比亚迪等占据全球市场份额半壁江山的电池巨头，更关键的是实现了对电池全价值链的高度自主可控。从上游看，中国占据了全球超过六成的关键电池材料精炼和加工产能；在中游制造环节，凭借对磷酸铁锂（LFP）技术的持续创新（如刀片电池、CTP 技术），开辟

① International Energy Agency. Solar PV Global Supply Chains [EB/OL]. (2023) [2025-12-04]. https://www.iea.org/reports/solar-pv-global-supply-chains.

了一条高安全、长寿命、低成本的优势技术路线；在下游，一个覆盖全国的动力电池回收网络正在加速成型，致力于实现关键金属的循环利用。这一从“摇篮”到“摇篮”的完整闭环，使得中国车企在成本控制和供应链稳定上获得了无与伦比的战略优势，成为全球汽车产业电动化转型中不可或缺的核心引擎。

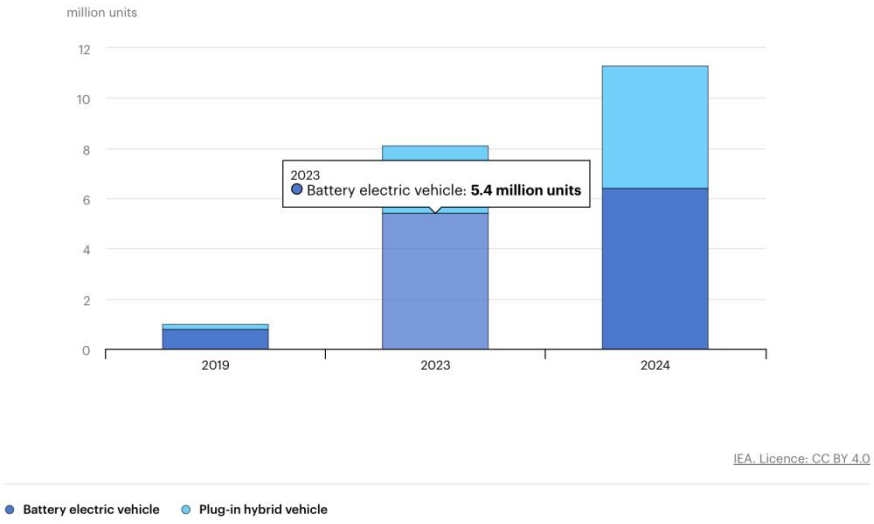


图 9 中国新能源汽车销量及增长趋势（2019、2023、2024 年）

资料来源：国际能源署（IEA）①

这些优势产业，不仅满足了国内庞大的绿色转型需求，也为全球市场提供了大量高品质、相对低成本的绿色产品，有力地加速了全球绿色转型进程。

① International Energy Agency. Electric car sales in China, 2019–2024 [EB/OL]. (2025-03-12) [2025-12-04]. https://www.iea.org/data-and-statistics/charts/electric-car-sales-in-china-2019-2024.

（二）面临的诸多挑战

在取得辉煌成就的同时，中国的绿色产业和绿色贸易面临的挑战同样不容忽视。

从产业层面看，部分绿色产品仍处于价值链中低端，在一些核心技术（如高端芯片、工业软件）和关键部件（如特种轴承）上对外依存度较高，产业链的安全性和韧性有待进一步提升。

从外部环境看，中国企业频繁遭遇各类绿色贸易壁垒。例如，欧盟的“碳边境调节机制”（CBAM）、新电池法规等环境贸易措施，虽名为环保，但其复杂的设计和高昂的合规成本，对中国绿色产品的出口构成了实质性障碍。同时，随着越来越多国家出台本国的绿色产业扶持政策（如美国的 IRA），中国绿色产品面临的国际竞争也日趋激烈，需要持续通过产业升级和创新突破来维持领先地位。

三、中国企业的绿色全球化实践

面对全球化的新形势，中国领先的绿色企业正通过更加多元和深入的路径，将其绿色能力与全球市场深度融合。

（一）战略融合：“绿色转型”与“国际化”同频共振

在中国企业的全球化进程中，绿色转型与国际化战略正发生深度融合。以 TCL 为例，其通过“全球本土化”（Glocalization）模式，将全球资源整合（如在全球设立研发中心）与本地市场响

应（如在波兰、墨西哥设厂满足当地市场需求）有机结合。TCL的全球化历程显示，中国企业正从早期的“产品国际化”（主要通过标准化产品出口）阶段，逐步转向“超全球化”新阶段，即通过在全球范围内布局研发、制造和营销网络，实现绿色创新资源的全球优化配置。

（二）路径多元：从并购、绿地投资到标准制定

中国企业的绿色全球化实践，已呈现出多元化的路径。

一是通过国际并购快速获取先进绿色技术。最经典的案例是吉利收购沃尔沃汽车，并全力推动其向全面电动化转型，这一战略举措不仅复兴了沃尔沃品牌，也极大提升了吉利自身在全球新能源汽车领域的技术储备和品牌形象。

二是通过海外绿地投资建立绿色生产基地。例如，远景能源、宁德时代等企业纷纷在欧洲、北美等地投资建厂，这不仅是为了靠近终端市场、规避贸易壁垒，更是实现绿色产能的国际合作，与当地供应链深度融合。

三是积极参与制定国际标准。华为、阳光电源等企业，凭借在光伏逆变器、智能光伏解决方案等领域的技术优势，积极参与相关国际电工委员会（IEC）等国际标准组织的活动，推动中国绿色技术和标准的国际化。这些实践，不仅提升了中国企业的全球竞争力，也为东道国带去了先进的绿色技术、投资和就业机会，实现了互利共赢。

第四章 推动绿色贸易自由化的政策建议

面对绿色贸易自由化进程中机遇与挑战交织的复杂局面，任何单一维度的应对措施均难以奏效。国际社会亟需构建一套多层次、多主体协同的系统性解决方案，以破除结构性障碍、凝聚全球共识、重建多边互信。本章将立足全球治理、国内政策、国际合作、数字赋能及标准构建五个维度，提出推动全球绿色贸易体系向开放、包容、公平、高效方向发展的政策建议。

一、加速完善多边框架下的绿色贸易规则

当前绿色贸易发展面临的核心制约，在于以 WTO 为核心的多边治理体系存在规则供给滞后与功能性障碍。修复并完善多边规则框架，是确立全球绿色贸易秩序的基石。

（一）构建更具包容性的多边贸易框架

为克服制度性障碍，国际社会应坚持“共同但有区别的责任”原则，从以下三个层面进一步完善多边框架：

一是重启并升级《环境产品协定》（EGA）谈判。EGA 谈判的长期停滞增加了全球绿色转型的成本。建议吸取过往经验，采取务实渐进的谈判策略。不再追求“一揽子”达成协议，而是建立动态调整的产品清单。该清单应兼顾发达国家与发展中国家的利益诉求，既纳入碳捕集与封存（CCUS）、高精度监测等高技术

产品，也纳入高效节水灌溉、分布式光伏等发展中国家急需的气候适应型产品，进一步增强协定的普惠性与可操作性。

二是落实实质性的差别待遇机制。鉴于各国绿色产业发展阶段的差异，应避免僵化的对等开放要求。新的一代贸易协定应包含强有力的“特殊与差别待遇”（S&DT）条款，允许发展中国家享有更长的过渡期和灵活的市场开放时间表。在符合 WTO 规则的前提下，允许其在政府采购等领域保留适度的政策空间，以扶持本国幼稚的绿色产业，避免过早暴露在成熟市场的冲击之下。

三是建立绿色标准互认的“良好行为准则”。针对标准不统一导致的技术性贸易壁垒（TBT），应在 WTO 框架下推动建立绿色标准互认机制。鼓励成员国签署多边或双边互认协议（MRAs），推动环境标志（如中国“十环认证”、欧盟“生态标签”）、能效标识及碳足迹认证的相互承认，实现“一次认证，多国通行”，显著降低企业的合规成本与交易成本。

（二）强化贸易与环境政策的协调性，避免单边措施异化

为防止“绿色保护主义”泛滥，应加强多边规则对单边环境贸易措施的约束与协调。

一是确立非歧视性的政策实施原则。各国在制定碳边境调节机制（CBAM）、绿色补贴等环境贸易措施时，应当严格遵循 WTO 的非歧视原则（国民待遇与最惠国待遇）。政策设计应确保透明度，并建立事前通报与审议机制。同时，发达国家在推行高标准

环境政策时，应配套提供技术援助和能力建设支持，帮助发展中国家提升合规能力，避免形成事实上的市场准入壁垒。

二是探索建立环境贸易争端快速解决机制。鉴于绿色贸易争端兼具技术复杂性与时效性，建议在 WTO 内部探索设立专门的争端解决专家组或快速通道。该机制应引入环境科学与贸易法双重背景的专家，在维护多边规则权威性的前提下，平衡环境保护权与贸易自由化之间的关系，防止单边贸易救济措施的滥用。

二、优化国内政策支持体系

多边规则的有效落地需要各国内部政策的支撑。各国应结合自身资源禀赋，构建与国际规则相衔接、能有效激发市场活力的政策体系。

（一）设计促进绿色贸易发展的国内政策体系

一是**发挥财政资金的杠杆效应。**参照中国《节能降碳中央预算内投资专项管理办法》等实践经验，政府应优化财政支出结构，精准支持绿色技术研发、低碳工艺改造及绿色供应链建设。通过税收抵免、研发补贴等方式，降低企业绿色转型的沉没成本，引导社会资源向绿色低碳领域集聚。

二是**健全绿色金融体系。**政府应大力发展绿色信贷、绿色债券及绿色保险市场，完善绿色金融标准与监管体系。通过提供风险分担机制（如政府担保）和优化投融资环境，引导私人资本大

规模参与绿色产业，为企业提供低成本、长周期的资金支持。

三是构建一站式绿色贸易服务平台：针对企业“出海”面临的信息不对称问题，政府应联合行业协会建立公共服务平台。提供目标市场的环境法规、准入标准、认证流程及贸易风险预警等信息服务，帮助企业特别是中小企业降低市场开拓门槛。

（二）优化中国的绿色贸易政策

作为全球最大的绿色产品制造国与贸易国，中国应在以下方面深化政策创新：

一是推动产业从“成本优势”向“技术优势”升级。在“双碳”目标引领下，深化产学研用结合，集中力量攻克储能材料、核心元器件、工业软件等领域的“卡脖子”技术，提升绿色产品的技术附加值与品牌影响力。同时，优化出口结构，严格限制高能耗、高排放初级产品出口，大力发展绿色技术与服务贸易。

二是打造全生命周期的绿色供应链。鼓励行业龙头企业发挥“链主”作用，建立涵盖采购、生产、物流、回收全流程的绿色供应链管理体系。积极参与国际规则制定，将中国在新能源汽车、光伏等领域的产业实践转化为国际标准提案，提升在全球绿色治理中的话语权。

三、强化国际合作与经验共享

面对全球气候危机，零和博弈没有出路，国际合作是推动绿

色贸易自由化的关键路径。

（一）推动绿色贸易自由化的关键动力

一是深化“南北合作”，落实技术援助承诺。发达国家应切实履行《巴黎协定》承诺，通过联合研发、专利许可、专家派遣等方式，向发展中国家转移环境友好型技术。应避免以知识产权为由设置额外市场壁垒，阻碍绿色技术的全球扩散。

二是拓展“南南合作”与共建“一带一路”。利用发展中国家在资源禀赋和发展阶段上的相似性，推广适用性强的绿色解决方案。依托共建“一带一路”倡议，加强在分布式能源、低成本治污、绿色农业等领域的交流合作，通过建设绿色贸易示范区，提升全球南方的绿色发展能力。

三是强化主要经济体的政策协调。支持WTO、UNCTAD（贸发会议）、UNEP（环境署）等国际组织开展政策对话。特别是中国、美国、欧盟等主要经济体应建立常态化沟通机制，就补贴政策、碳定价机制等关键议题进行协调，减少政策外溢带来的贸易摩擦。

（二）发挥国际交流平台的桥梁作用

充分利用中国国际进口博览会（CIIE）、虹桥国际经济论坛等高能级平台，构建绿色贸易全球对话与合作的新枢纽。CIIE作为目前世界上规模最大、层级最高的进口类展会之一，其天然具备集聚全球绿色供给侧与需求侧的功能。通过在会期内设立“绿

色贸易”“绿色技术与创新”“零碳供应链”等专题板块，不仅能集中展示来自全球的前沿绿色解决方案，如下一代光伏技术、先进储能、绿色氢能、碳管理数字化工具等，也能成为各国政府部门、国际组织、跨国企业和智库学者纵深探讨绿色贸易规则的系统化平台。

虹桥国际经济论坛作为 CIIE 的“思想引擎”，近年来已逐渐成为国际多边主义、开放合作、贸易政策协调的重要公共产品。论坛中“开放发展”“绿色与可持续发展”主题下的平行论坛，为全球绿色贸易治理的议题设置、政策倡导和规则创新提供了制度化空间。例如，可将“绿色标准的国际互认”“低碳供应链建设”“绿色金融与投融资机制”纳入未来年度重点研讨方向，通过连续的对话积累跨国共识，形成可复制、可推广的制度成果。

在此基础上，建议依托这类综合性国际平台，倡议建立“全球绿色技术共享机制”（Global Green Technology Sharing Mechanism）。该机制应当以“知识产权保护与可及性并重”为核心原则，一方面保障技术创新主体合法权益，另一方面通过差异化授权、分级许可、绿色合作基金等方式，降低关键低碳技术在发展中国家的获取成本与应用门槛。例如，可参考医药领域的“专利池”模式，由多边机构牵头设立“绿色技术专利池”，推动可再生能源装备、能效改造、节水农业、气候适应技术等核心领域的部分专利以合理费用向发展中国家开放许可。

此外，平台机制可与“一带一路”绿色发展合作、南南合作

援助基金、世界银行气候投资基金（CIF）等现有国际融资工具联动，为发展中国家在引进、消化和本土化适配低碳技术方面提供多渠道资金支持。同时，引导跨国企业在上述机制框架下开展示范项目，通过“技术+设备+标准+运营”的成套输出，帮助更多发展中国家构建绿色产业能力，提升其在全球绿色贸易体系中的参与度与竞争力。

四、利用数字技术赋能绿色贸易

数字化是绿色化的加速器。推动数字技术与绿色贸易的深度融合，将为提升贸易透明度与效率提供技术支撑。

（一）提升贸易全链条的透明度与可信度

推广区块链、物联网（IoT）等技术在绿色供应链管理中的应用，构建不可篡改的全生命周期追溯体系。对原材料开采、生产加工、物流运输及回收利用各环节的碳排放、能耗数据进行实时记录与存证。这不仅能有效打击“洗绿”（Greenwashing）行为，也为碳足迹认证、绿色标识提供了可信的数据基础。

（二）发展数字绿色贸易平台，降低交易成本

大力发展跨境电商与数字服务贸易，降低绿色产品的交易与流通成本。通过建设线上绿色技术交易市场，打破地理限制，促进创新要素的全球流动。同时，各国应加强数字贸易规则的协调，

在保障国家数据安全与个人隐私的前提下，建立数据跨境流动管理机制，确保绿色产品溯源、碳核算所需数据的顺畅流通。

五、加速构建全球统一编码体系

标准的缺失是当前绿色贸易领域混乱和摩擦的根本原因之一。加速构建一套全球统一的编码体系，是实现绿色贸易规则化、透明化的“基础设施”工程。

（一）率先构建中国标准，贡献“中国方案”

在全球统一标准短期内难以达成的情况下，中国作为全球最大的绿色产品生产国和贸易国，应主动作为。建议由商务部、海关总署牵头，联合国内顶尖智库和行业机构，研究并建立一套与国际接轨、同时符合中国国情的“中国绿色贸易统计分类参考标准”。这项工作可以直接承接《关于拓展绿色贸易的实施意见》中提出的任务，形成的研究成果，不仅可以用于指导国内的政策制定，更可以为未来的国际谈判贡献一份有理有据的“中国方案”。

（二）推动关键领域互认，以点带面

在现阶段追求全球统一编码不现实的情况下，可采取务实的策略，优先选择光伏、风电、新能源汽车等中国具有显著产业优势的领域，或再生金属等全球共同关注的关键资源领域，积极推

动与主要贸易伙伴在标准、认证和标识上的双边或诸边互认。通过在这些关键领域率先取得突破，形成示范效应，以点带面，逐步扩大共识范围。

（三）积极参与国际规则制定，推动建立“活的清单”

应更积极地利用 WTO、APEC 等国际平台，主动将国内的研究成果和实践经验带入国际讨论，在全球统一编码体系的制定中发出更强的“中国声音”。可以积极倡导并参与制定全球统一的绿色贸易编码体系，并推动在这一体系下建立“活的清单”机制，即分类体系能够定期更新，动态调整，以适应未来绿色技术的快速迭代和创新。

（四）强化数据基础与研究

统一分类体系的建立，离不开坚实的数据基础。应鼓励国内外的研究机构，对 UN Comtrade 等国际贸易数据库进行深度清洗和补全，识别和标注出潜在的绿色产品，为统一分类体系的建立提供更可靠的数据支撑。事实上，中国科学院等机构已在开展改进国际贸易基础数据的研究工作，这类基础性的、公益性的努力应持续获得支持。

第五章 展望未来

人类社会正行进在一个充满挑战与希望的绿色转型时代。这场以应对气候变化为核心驱动的深刻变革，其广度、深度和影响力将不亚于历史上的任何一次工业革命。在这场波澜壮阔的变革中，绿色贸易，作为连接全球创新、生产与消费的关键纽带，已无可争议地从边缘走向中心，成为决定全球绿色转型成败的关键变量。本报告在系统性剖析了全球绿色贸易的现状趋势、机遇挑战、中国角色以及未来路径之后，在此对未来进行展望并作出总结。

一、全球绿色转型与绿色贸易自由化的必然前景

全球绿色转型是关乎人类共同未来的紧迫任务，绿色贸易自由化则是加速这一进程的关键杠杆。这一核心论断，是基于对当前全球面临的严峻气候现实和实现可持续发展目标的内在逻辑的深刻洞察。正如本报告引言所述，全球气温的持续攀升已不再是未来的风险，而是正在发生的危机，其引发的极端天气事件正对全球经济稳定、粮食安全和人类福祉构成直接威胁。在此背景下，加速以能源清洁化、经济低碳化为核心的绿色转型，是国际社会唯一的、也是正确的选择。

然而，这场转型的最大制约因素之一便是巨大的成本与技术鸿沟。绿色贸易自由化，正是破解这一难题的最有效、最符合市

场规律的工具。通过降低绿色产品与技术的贸易壁垒，国际社会可以更有效地配置全球的绿色创新资源，降低全球减排成本，增强各国特别是发展中国家应对气候变化的能力。其内在的传导机制和巨大潜力体现在以下几个层面：

其一，绿色贸易是全球减排成本的“降低器”。自由贸易通过促进全球范围内的分工与协作，能够最大限度地发挥规模经济和“学习曲线”效应。本报告在第三部分深度剖析的中国光伏产业便是最佳例证。正是因为一个开放的全球市场，使得中国能够将其强大的制造能力和持续的技术创新转化为全球可负担的清洁电力，在过去十年间将光伏发电的度电成本降低了近90%。消除现存的关税与非关税壁垒，将进一步加速这一进程，使得风力发电机、新能源汽车、储能设备等关键绿色产品以更低的价格惠及全球，从而用同样的资金实现更大规模的减排，直接降低全球实现《巴黎协定》目标的经济总成本。

其二，绿色贸易是绿色创新资源的“优化器”。开放的贸易与投资环境能够引导资本、技术、人才等创新要素流向效率最高、回报最大的地区和产业，形成充满活力的全球绿色价值链。在竞争与合作中，各国企业为了赢得市场，有必要不断进行技术研发和模式创新，从而加速整个绿色技术体系的迭代升级。反之，保护主义的壁垒只会割裂市场，导致低效的重复建设和创新动力的衰减。

其三，绿色贸易是发展中国家能力建设的“赋能器”。对于

广大的发展中国家而言，它们是气候变化最直接的受害者，却往往最缺乏应对所需的资金和技术。绿色贸易自由化，意味着它们能够以更可负担的成本，获取先进的清洁能源技术、节水灌溉设备、灾害预警系统等，帮助它们在发展经济的同时，构建更具气候韧性的社会，实现联合国可持续发展目标。

当前，虽然绿色贸易自由化面临着“绿色保护主义”抬头、地缘政治博弈加剧等各种挑战，但随着全球绿色共识的持续增强和颠覆性绿色技术的不断进步，绿色贸易前景广阔。挑战是阶段性的，而绿色发展的历史大趋势是不可逆转的。气候的“硬约束”和技术的“硬道理”，将最终穿透保护主义的“软壁垒”，推动全球绿色贸易航船继续破浪前行。

二、中国在全球绿色贸易自由化中的角色与担当

中国作为全球绿色贸易的重要参与者与贡献者，可通过国内国际双循环相互促进，在推动全球绿色贸易自由化中发挥更大作用。中国的角色并非旁观者或被动的接受者，而是已经深度融入并正在积极塑造全球绿色贸易格局的核心力量。立足新发展格局，中国有能力、也有责任在全球绿色治理中展现更大担当。

对内，持续优化绿色产业政策，完善绿色贸易促进体系，是夯实中国贡献能力的“内循环”基石。

在产业政策层面，中国始终在“双碳”目标的战略引领下，从追求“规模扩张”向更加注重“质量提升”和“安全韧性”

转变。这意味着要继续加大对基础研究和关键核心技术的投入，在高端材料、核心元器件、工业软件等领域补齐短板，提升中国绿色产业在全球价值链中的地位。同时，要着力构建从原材料采购到生产、消费、回收的全流程绿色供应链管理体系，提升产业的整体可持续竞争力。

在贸易促进体系层面，中国应加快完善与国际接轨的绿色贸易标准、认证和统计监测体系。正如第四部分建议所述，率先构建一套科学的“中国绿色贸易统计分类参考标准”，不仅能提升国内政策的精准度，更能为未来的国际谈判提供一份有理有据的“中国方案”。此外，政府应搭建更高水平的公共服务平台，为企业，特别是“出海”的中小企业，提供海外市场环境标准、合规要求、风险预警等一站式服务。

对外，深化多双边绿色合作，推动构建公平、包容的全球绿色贸易规则，是中国发挥全球作用的“外循环”路径。

在多边层面，中国应继续坚定维护以 WTO 为核心的多边贸易体制，积极推动 EGA 谈判的重启与升级，在 TESSD 等新平台中就规制单边环境措施、建立政策“等效性”承认机制等关键议题，贡献建设性方案。

在区域与双边层面，中国应积极推动在《区域全面经济伙伴关系协定》（RCEP）等框架下深化绿色合作，并与更多贸易伙伴商签高水平自贸协定，将绿色贸易和可持续发展作为其中的重要章节。

通过主办进博会、虹桥论坛等国际平台，中国正为全球绿色对话与合作开辟新空间，彰显了开放共享的绿色发展理念。这些平台不仅是全球绿色技术和产品的“首发地”“首展地”，更是全球政商学界精英就绿色贸易规则、标准互认、供应链合作等重大议题进行坦诚对话、凝聚共识的宝贵场域。中国应继续善用这些平台，向世界展示其推动构建开放型世界经济和清洁美丽世界的决心与行动。

三、面向未来的共同行动与人类愿景

面向未来，随着全球绿色转型进程加速和新技术不断涌现，绿色贸易的内涵与外延将持续扩展。正如本报告所分析，未来的竞争焦点将从产品本身更多地转向背后的标准、数据和服务。碳足迹管理、绿色金融、循环经济解决方案等服务贸易的比重将日益提升；基于区块链、物联网和人工智能的数字绿色贸易，将深刻重塑贸易的形态与效率。

面对这样一个充满变革与机遇的未来，孤立主义、保护主义是逆历史潮流而动，注定没有出路。各国政府、企业和国际组织应秉持人类命运共同体理念，坚持多边主义，破除绿色贸易壁垒，共同建设清洁美丽的世界，实现《巴黎协定》设定的全球气候目标，为后代创造更加可持续的未来。

对于各国政府而言，这意味着应展现出超越短期国内政治利益的远见和决心，将气候安全和可持续发展置于国际议程的优先

位置。重拾对多边主义的信心，回到谈判桌前，通过对话与协商，共同构建一套能够平衡发展权与环境责任、激励创新与保障公平的全球绿色贸易治理新秩序。

对于全球企业而言，这意味着需要将ESG（环境、社会和治理）理念深度融入其核心战略与日常运营。不仅要追求自身的绿色低碳转型，更要带动整个供应链的协同降碳，将可持续发展转化为企业长期的、核心的竞争力。

对于国际组织而言，这意味着需要更积极地发挥其作为知识中心、协调平台和规则维护者的关键作用。WTO、UNCTAD、UNEP等机构应加强协作，为全球绿色贸易提供更权威的数据分析、更科学的政策建议和更公正的争端解决平台。

总而言之，推动绿色贸易自由化，绝非零和博弈，而是一个能让所有参与方共同受益的正和游戏。它不仅是关乎经济增长的商业选择，更是关乎人类共同命运和子孙后代福祉的道义抉择。人类只有一个地球，各国共处一个世界。唯有秉持开放合作、互利共赢的精神，携手拆除壁垒，共享绿色创新成果，我们才能共同驾驭绿色转型的历史性机遇，将《巴黎协定》的宏伟蓝图转化为现实，共同守护我们赖以生存的蓝色星球，为子孙后代留下一个清洁、美丽、繁荣的可持续未来。

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研究机构及课题组

全球化智库介绍

全球化智库（Center for China and Globalization, CCG）是中国领先的国际化社会智库，成立于 2008 年，是唯一获得联合国特别咨商地位的中国智库，也是首个进入世界百强的中国社会智库，在国内外多个权威智库排行榜单均被评为中国社会智库第一。

CCG 被人社部授予博士后科研工作站，并拥有独立招收博士后资质，是中联部“一带一路”智库联盟理事单位，中央人才工作协调小组全国人才理论研究基地，人社部中国人才研究会国际人才专业委员会所在地，财政部“美国研究智库联盟”创始理事单位，中国公共关系协会副会长单位，是“国际青年领袖对话（GYLD）”项目的秘书处所在地。2021 年，CCG 发起的“国际青年领袖对话（GYLD）”项目获得了习近平主席回信。

CCG 总部位于北京，在国内外有多个分支机构和海外代表，拥有全职智库研究和专业人员百余人。CCG 秉承“国际化、影响力、建设性”的专业定位，坚持“以全球视野为中国建言，以中国智慧全球献策”，致力于全球化、全球治理、国际关系、国际经贸与投资、国际人才与企业全球化、一带一路、华人华侨及智库发展等领域的深入研究。

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本报告得到虹桥国际经济论坛秘书处的大力支持，在此特别感谢。由于撰写和编辑匆促，报告中难免出现纰漏。欢迎社会各界批评指正，以便我们在未来的研究工作中获得进益。

2025

迈向绿色贸易新纪元：全球绿色转型的机遇、路径与中国角色

TOWARD A NEW ERA OF GREEN TRADE: OPPORTUNITIES, PATHWAYS, AND CHINA'S ROLE IN THE GLOBAL GREEN TRANSITION

2025年11月

CCG 全球化智库
CENTER FOR CHINA & GLOBALIZATION

Introduction

Human society stands at a pivotal crossroads that will shape the trajectory of our collective future. Climate change—once perceived as a distant environmental concern—has now evolved into the most urgent and far-reaching systemic crisis confronting the world today. It transcends borders, ideologies, and stages of development, exerting profound and unprecedented impacts on global economic systems, social structures, and political dynamics. The 1.5°C temperature-control goal set out in the *Paris Agreement* represents the core consensus of the international community in addressing the climate crisis. As underscored by the Intergovernmental Panel on Climate Change (IPCC), achieving this goal is "critical to reducing the risks of climate change for natural and human systems and advancing sustainable development."

Yet the gap between aspiration and reality is widening, and the alarm bells are ringing louder than ever. In its latest *Global Annual to Decadal Climate Update*, the World Meteorological Organization (WMO) issued a stark warning: there is an 80% likelihood that at least one year between 2024 and 2028 will record a global average temperature 1.5°C above pre-industrial levels. This is no longer a projection about the future, but a reality already unfolding before our eyes. The continued rise in global temperatures is triggering cascading and increasingly frequent climate-related events across the world—on a scale and with an intensity without historical precedent.

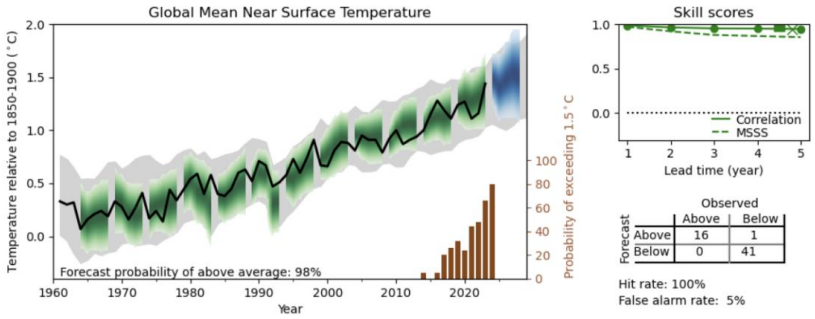


Figure 1. Global Near-Surface Temperature Anomalies and Projected Risks of Exceeding 1.5°C

Note: This figure, published by the World Meteorological Organization (WMO), presents forecasted global near-surface temperature anomalies for the next five years relative to the 1991–2020 average. The red-shaded areas indicate temperature levels significantly above the historical baseline, offering a clear visual representation of the continued and intensifying trend of global warming.

Extreme weather events—including continent-wide heatwaves, superstorms that devastate homes, and severe droughts and floods that threaten global food security—have become the "new normal" in today's world. These climate-induced disasters not only pose direct threats to human life but also inflict severe economic losses worldwide. According to estimates from the World Bank, without urgent action, annual economic damages caused by climate change could reach several trillion dollars by 2050. In this escalating crisis, developing countries , which lack the financial resources, technology, and infrastructure necessary for effective climate response, are facing increasingly severe challenges to both survival and development.

Facing this global challenge that concerns the shared destiny of humankind, a profound and systemic green transformation has become the path we must now choose—a transition that encompasses all dimensions, including energy structures, industrial models, technological pathways, and even lifestyles. However, the realization of this transformation unquestionably requires massive investment. The International Energy Agency (IEA), in its *World Energy Investment Report*, clearly points out that to achieve global net-zero emissions, annual global investment in clean

energy must reach USD 4.5 trillion by 2030. Although clean energy investment worldwide reached a record USD 1.8 trillion in 2023, the figure remains more than USD 2.7 trillion short of what is required each year. This substantial investment gap underscores the urgent need for high-cost-effective products, advanced technologies, and more efficient resource allocation.

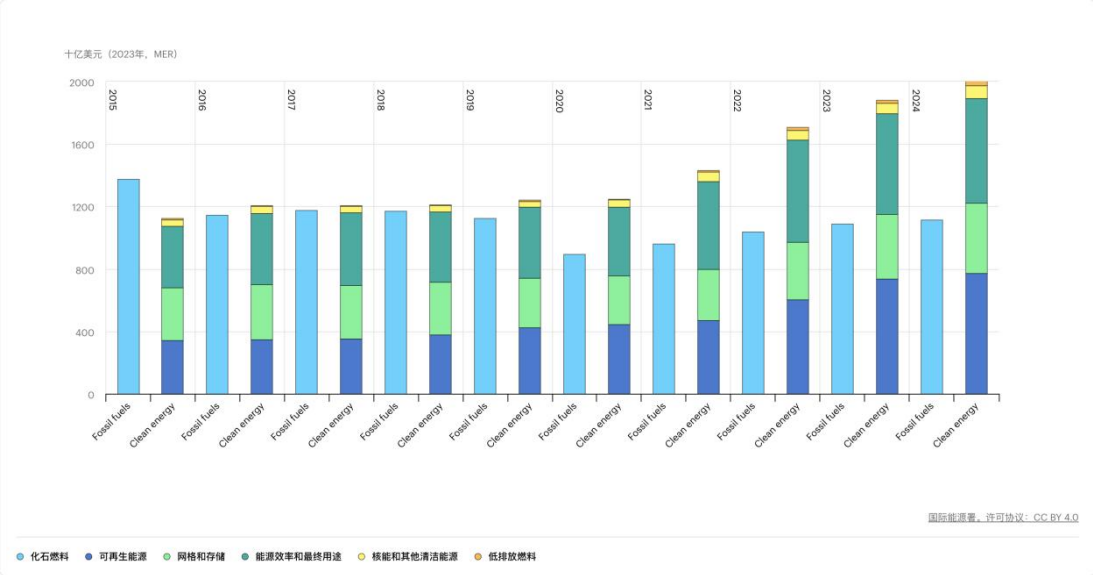


Figure 2. Global Energy Investment Structure, 2015–2024

Note: This figure is based on authoritative data from the International Energy Agency (IEA) and illustrates the structural evolution of global energy investment from 2015 to 2024 (estimated).

Against this backdrop of urgent demand, Green Trade[①], has become a central bridge linking environmental sustainability with economic growth. It has rapidly evolved from a peripheral issue in international trade into a leading and essential force reshaping global trade rules and driving transformative changes in global governance. As green products such as solar panels, wind power equipment, new energy vehicles,

① In policy documents issued by relevant United Nations agencies, green trade primarily refers to the coordination between trade and the environment. Documents such as Agenda 21, the Rio Declaration on Environment and Development, the Report of the World Summit on Sustainable Development, and the Global Sustainable Development Report all emphasize that trade and the environment are complementary, mutually reinforcing, and should be advanced in a coordinated manner. In 2021, the United Nations Environment Programme (UNEP) released Green International Trade: The Way Forward, which repeatedly references green trade and proposes an Environment and Trade 2.0 agenda, including strengthening environment-related trade policies, promoting upgraded environmental regulation through trade policies and agreements, and advancing cooperation on environment–trade linkages. The European Union's policy documents, including Adapting to Climate Change: Towards a Framework for European Action, also highlight green trade, typically referring to two dimensions: green trade measures and trade in green products.

and energy storage technologies are exchanged with increasing frequency in international markets, related industries are breaking through geographic constraints and forming more efficient patterns of resource allocation on a global scale. At the same time, competitive pressure in international markets and the effects of large-scale production have accelerated cost reductions in green technologies, making them more accessible to countries at different stages of development. Moreover, green trade has facilitated technological collaboration and industrial-chain linkages among multinational enterprises and institutions, providing new momentum for innovation and diffusion of green technologies and gradually forming a collaborative network that underpins the global green transition.

In recent years, global green trade has demonstrated exceptionally strong momentum, revealing immense market potential and remarkable resilience. According to joint statistics from the World Trade Organization (WTO) and the International Energy Agency (IEA), the scale of international green trade reached a historic USD 5 trillion in 2024-an extraordinary 85% increase compared with 2020-and its share of total global goods and services trade climbed to 18%. Behind these figures lies the widespread global consensus and firm commitment to pursuing green, low-carbon, and sustainable development pathways.

Amid this sweeping global green transition, the world landscape is undergoing profound changes, and China is experiencing a historic shift from a "participant" to an "important contributor" and an "active leader". Leveraging its full industrial-chain strengths in renewable energy, new energy vehicles, and related sectors, China has not only built a solid foundation for its own green development but has also supplied global markets with large volumes of high-quality and high-cost-effectiveness green products. This has significantly advanced global energy transitions and notably reduced worldwide emission-reduction costs. A new era driven by green trade is emerging—an era whose opportunities, challenges, and far-reaching transformations merit comprehensive and in-depth examination.

Section I：Current State and Emerging Trends of Global Green Trade

Against the broader global narrative of combating climate change and pursuing sustainable development, green trade has transformed from a relatively specialized and marginal field into a core force driving global economic restructuring and reshaping international competitiveness. It not only represents a new engine for economic growth but also serves as a key pathway for achieving the goals of the *Paris Agreement* and building a community with a shared future for mankind. This section provides a systematic overview of the evolution and landscape of global green trade and analyzes the fundamental mechanisms that underpin its development.

I. The Emergence and Evolution of Green Trade

The rise of green trade has not occurred overnight; rather, it has gradually taken shape alongside the deepening global understanding of the relationship between the environment and development. Its conceptual foundations, definitional boundaries, and global significance have all undergone a profound process of evolution.

1. Theoretical Origins: From Sustainable Development to a Global Consensus

The theoretical foundation of green trade is rooted in the concept of "sustainable development." This notion was first introduced in the 1987 report *Our Common Future* by the World Commission on Environment and Development (WCED), which offered the classic definition: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." This marked a revolutionary leap in humanity's understanding of development, placing intergenerational equity and environmental carrying capacity at the core of

development considerations for the first time.

The 1992 United Nations Conference on Environment and Development (the Rio Earth Summit) represented a milestone in transforming this idea into global action. *Agenda 21*, adopted at the conference, established a comprehensive action framework for global sustainable development and explicitly recognized the dual role of trade in achieving these goals: on one hand, disorderly trade may exacerbate environmental degradation and resource depletion; on the other hand, an open, fair, and non-discriminatory multilateral trading system can serve as a powerful tool for promoting sustainable development by optimizing resource allocation and enabling the dissemination of environmentally friendly technologies. From that point forward, "trade and environment" became a standing item on the international policy agenda.

Entering the 21st century—and especially with the adoption of the *2030 Agenda for Sustainable Development* and the *Paris Agreement* in 2015—green trade has gained unprecedented political momentum. These landmark agreements established the top-level legal and policy architecture for global climate action and sustainable development, translating mitigation, adaptation, and climate finance commitments into concrete obligations. Within this framework, green trade is no longer regarded merely as an auxiliary tool for environmental protection; rather, it has been elevated to a strategic pillar for achieving Nationally Determined Contributions (NDCs), accelerating the global energy transition, and building green, low-carbon economic systems.

2. Defining the Scope and Expanding the Dimensions of Green Trade

With the deepening of practical experience, the connotations and scope of green trade have continued to expand, forming a diversified and multidimensional framework.

First Stage: Focus on "Environmental Products"

In its early phase, the core concept of green trade was relatively narrow, primarily referring to "environmental products" as defined by organizations such as the Organisation for Economic Co-operation and Development (OECD) and the Asia-Pacific Economic Cooperation (APEC). These products were mainly used for environmental monitoring, pollution control, and resource management—for example, wastewater filtration systems, air purification equipment, and waste recycling technologies. Policy discussions during this stage largely focused on reducing tariff barriers applied to these specific categories of goods.

Second Stage: Expansion to "Green Services" and "Green Technologies"

As the global economy shifted toward greater service orientation, it became increasingly clear that hardware products alone were insufficient. Green services emerged as an essential component of green trade, comprising cross-border services aimed at supporting environmental objectives—such as environmental impact assessments, carbon auditing and consulting, green architectural design, engineering-procurement-construction (EPC) services for renewable energy projects, and green finance and insurance. These high–value-added service sectors are crucial for the implementation and effective operation of green projects. Meanwhile, green technology trade extended beyond physical products to include licensing of environmental patents, transfer of proprietary technologies, and authorization of low-carbon industrial processes, serving as a key channel for technological diffusion and innovation.

Third Stage: Moving Toward "Green Transformation of Entire Value Chains"

Green trade has now entered what can be characterized as its 3.0 era, centered on promoting the overall greening of global value chains (GVCs). This stage shifts the focus beyond whether a final product is "green," emphasizing instead whether its full lifecycle—production, transportation, consumption, and recycling—meets

sustainability standards. Under this broader conceptualization, circular economy products (such as remanufactured components and recycled raw materials), sustainably sourced agricultural and forestry goods, and consumer products with traceable carbon footprints are all included within the expanded domain of green trade. The primary objective of this stage is to transition from isolated product-level trade toward building a closed-loop, sustainable global production and consumption system.

3. The Changing Global Status of Green Trade: From Periphery to Core

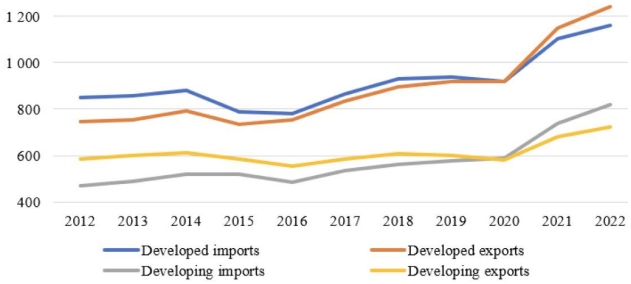
As its connotations continue to expand, the global status of green trade has undergone a historic transformation. At the end of the 20th century, it was largely regarded as an "externality" to be managed within the broader process of trade liberalization. Today, however, it has become a central agenda item in reshaping global economic and trade rules and guiding international economic cooperation. Green trade and sustainable development chapters have become indispensable components in ministerial meetings of the World Trade Organization (WTO), G20 summits, and negotiations on major regional trade agreements. As noted in the introduction of this report, its market size—reaching USD 5 trillion and accounting for 18% of total global trade—demonstrates that green trade has evolved from a former "supporting role" into one of the dual engines driving both global economic growth and the green transition.

II. The Scale, Structure, and Regional Landscape of Global Green Trade

Global green trade is expanding at an unprecedented pace and scale, demonstrating strong market dynamism and clear structural transformation trends.

1. Market Size and Growth Trends

In recent years, global green trade has experienced exceptionally rapid growth, far outpacing the overall growth rate of global goods and services trade during the same period. This reflects its strong counter-cyclical resilience and endogenous growth momentum. According to statistics from the United Nations Conference on Trade and Development (UNCTAD), the latest available data show that global trade in environmental products approached USD 2 trillion in 2022, reaching a historical high. Behind this trend lies the continuous increase in global investment in the green transition.



Source: UNCTAD calculations based on the UN Comtrade Database. Data for 2022 are preliminary.

Figure 3. Global Trade in Environmental Products, 2012–2022 (USD billions)

Source: United Nations Conference on Trade and Development (UNCTAD)[①]

2. In-Depth Analysis of Trade Structure

Within the vast USD 5 trillion market, the internal structure of global green trade also reflects diverse characteristics that correspond to different dimensions of the global green transition.

Green products trade (approximately 60%): This constitutes the foundation and main body of green trade. Among these, the most striking performers are the "new trio" of electric vehicles, lithium batteries, and solar cells , which have become the

① United Nations Conference on Trade and Development (UNCTAD). International Trade and Development 2023: Report of the Secretary-General (A/78/230) [EB/OL]. [2025-11-26]. https://unctad.org/system/files/official-document/a78d230_en.pdf.

primary engines of growth. In addition, trade in wind turbine systems, energy storage equipment, energy-efficient appliances, and environmentally friendly materials has also continued to expand.

Green services trade (approximately 25%): This is a rapidly growing sector with even higher added value. As global investment in green projects continues to rise, demand for cross-border services such as green finance, technical consulting, engineering design, certification services, and risk management has increased significantly.

Carbon trading (approximately 15%): With the improvement of global and regional carbon pricing mechanisms (e.g., the EU Emissions Trading System, EU-ETS), cross-border transactions of carbon allowances and carbon credits have become increasingly active. This emerging form of commodity trade, with environmental capacity as its underlying asset, is growing in both market scale and financial sophistication.

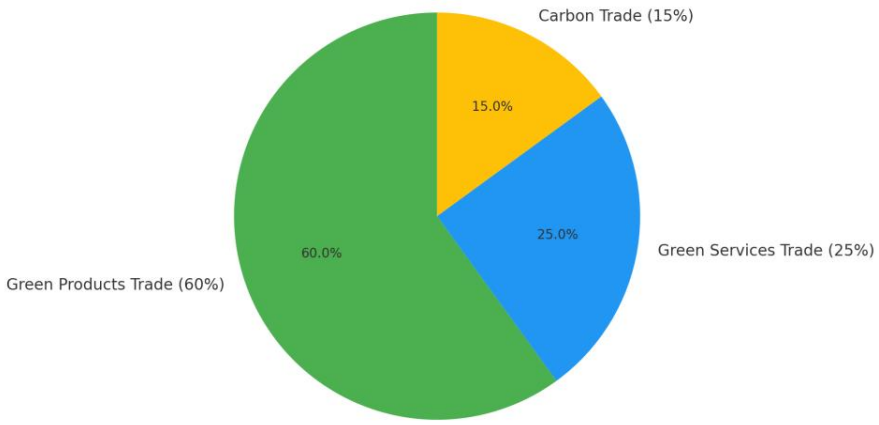


Figure 4. Global International Green Trade Structure in 2024

Source: World Trade Organization (WTO), International Energy Agency (IEA)

3. Regional Landscape and Trade Flows

At present, the geographical landscape of global green trade exhibits a "tri-polar"

structure, with the European Union, North America, and East Asia constituting the core hubs of global green trade. However, the roles and strengths of these three major regions differ significantly, creating a complex web of competition and cooperation.

i. European Union: Rule Setter and Leader of the High-End Market

Driven by the European Green Deal, the European Union acts as a global "rule maker" in the field of green trade. Its introduction of the Carbon Border Adjustment Mechanism (CBAM), the new Battery Regulation, and the Ecodesign for Sustainable Products Regulation (ESPR) has helped shape global standards and thresholds for green trade. At the same time, the EU itself is a major consumer market for high-end green technologies, products, and services.

ii. North America (primarily the United States): A Policy-Driven Domestic Market and Center of Technological Innovation

Through large-scale industrial policies such as the *Inflation Reduction Act* (IRA), the United States has stimulated domestic demand in clean energy manufacturing and the electric vehicle sector with substantial subsidies and tax credits. Meanwhile, the U.S. continues to lead globally in frontier research and innovation in green technologies, including next-generation energy storage, hydrogen energy, and carbon capture technologies.

iii. East Asia (with China at its center): Global Green Manufacturing Center and Key Supply Chain Hub

East Asia, especially China, has become one of the world's most important manufacturing and supply bases for green products, supported by strong industrial

capabilities, comprehensive supply-chain ecosystems, and significant economies of scale. From solar photovoltaic panels to power batteries and wind turbines, China holds a dominant position in the midstream segment of global manufacturing and is rapidly expanding toward both ends of the value chain, including research and development, design, and brand marketing.

In terms of trade flows, the pattern has evolved from the earlier model of "developed countries exporting environmental equipment to developing countries" into a more complex, multidirectional structure. For example, China exports photovoltaic modules and electric vehicles to global markets; the EU exports high-end manufacturing equipment and environmental technologies to China; and the United States attracts large inflows of global green investment. Meanwhile, "South–South green trade" among developing countries is also emerging, with strong growth potential.

Section II：Opportunities and Challenges in Green Trade Liberalization

Promoting green trade liberalization, which refers to the systematic reduction and elimination of tariff and non-tariff barriers on green products, services, and technologies, has become a crucial pathway for the global community to address the climate crisis and achieve sustainable development goals. However, this path is far from smooth. Behind the vast opportunities lie deep structural constraints and increasingly complex geopolitical and economic dynamics. This section procides an in-depth analysis of the dual dimensions of opportunities and challenges associated with green trade liberalization.

I. Opportunities: An Accelerator for Unlocking the Potential of Global Green Transition

Green trade liberalization, at its core, leverages the decisive role of the market in resource allocation to accelerate the diffusion and adoption of green technologies and solutions worldwide in the most efficient and cost-effective manner.

1. Reducing Global Green Transition Costs and Accelerating Technology Diffusion

The essence of the green transition lies in replacing high-energy, high-emission traditional systems with clean and low-carbon technologies and products. However, high upfront costs， particularly for developing countries with limited financial and technological capacity, remain a major barrier. Green trade liberalization provides a powerful tool to overcome this challenge.

According to estimates by the Organisation for Economic Co-operation and Development (OECD), although average tariffs on environmental products are not

particularly high globally, tariff peaks for certain key products and in some countries can exceed 35%. Non-tariff barriers, such as complex certification procedures and discriminatory technical standards, often impose even higher implicit costs. Removing these barriers can therefore generate substantial economic benefits.

First, it directly reduces product prices. Lowering tariffs cuts the cost of importing key products such as solar panels, wind turbines, and energy-efficient equipment, making renewable energy projects and energy-saving upgrades more commercially viable across more countries. A World Bank study shows that fully eliminating trade barriers on environmental products could increase the trade volumes of related goods by more than 15% and significantly reduce countries' compliance costs for emission-reduction commitments.

Second, it promotes economies of scale. An open and integrated global market enables leading green firms to expand production, reduce research and development and manufacturing costs through scale, and drive continuous price declines along the learning curve, which has been one of the key factors behind the sharp reduction in solar and wind power costs over the past decade.

Third, it empowers developing countries. For most developing economies, which are net importers of green technologies, trade liberalization allows them to access advanced technologies and equipment needed for climate action at lower cost. This enables them to leapfrog traditional high-carbon development paths and pursue sustainable, transformative growth.

2. Promoting Global Green Innovation and Industrial Upgrading

An open trade environment is the most effective catalyst for stimulating innovation. Green trade liberalization, by introducing international competition, can break domestic monopolies and inertia, compelling firms to continuously pursue technological innovation, improve energy efficiency, and optimize production processes, thereby enhancing the green competitiveness and value-added capacity of

entire industries.

At the same time, it facilitates the formation and deepening of global green value chains (GVCs). The power battery industry for new energy vehicles offers a strong example: its value chain has become highly globalized. Upstream critical minerals such as lithium, cobalt, and nickel are sourced from Australia, Chile, and the Democratic Republic of the Congo; midstream materials which include cathodes, anodes, electrolytes, and separators, are produced in Japan, South Korea, and China; and final cell assembly and integration take place across major automobile markets worldwide. This global division of labor enables countries to specialize in segments where they hold comparative advantage, while knowledge and technology spillovers collectively accelerate progress in core areas such as battery energy density, safety, and cost control.

3. Creating Large-Scale Green Employment and Emerging Markets

The green transition is not only an environmental agenda but also a powerful engine for a new wave of economic growth and employment creation. Green trade liberalization plays a key role in unlocking this engine.

First, it creates green jobs. According to the latest report by the International Renewable Energy Agency (IRENA), global employment in the renewable energy sector reached 16.2 million [①] in 2023. From 2023 to 2030, employment in renewable energy–related industries will continue to grow. Trade liberalization expands global markets for renewable energy equipment, directly supporting the sustained growth of these jobs.

① IRENA. Renewable Energy and Jobs Annual Review 2024. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2024/Oct/IRENA_Renewable_energy_and_jobs_2024.pdf.

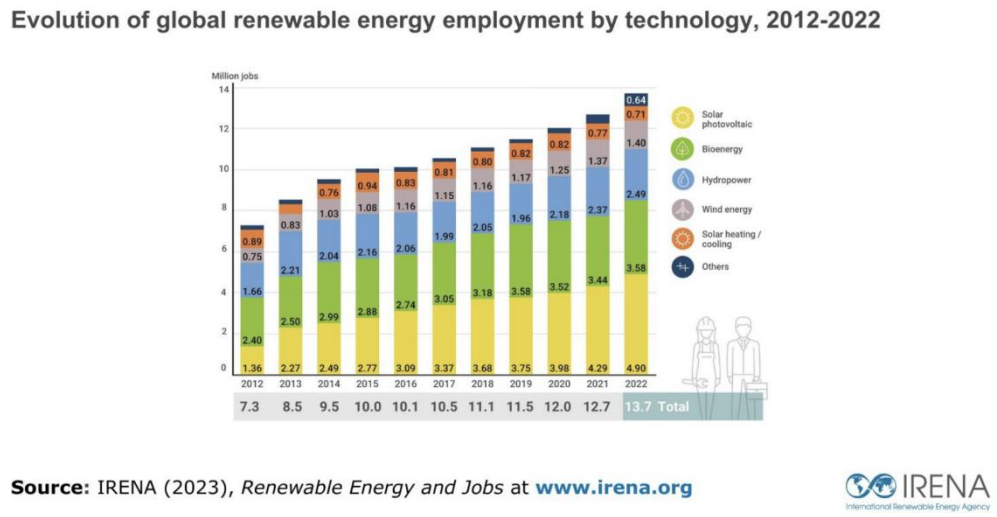


Figure 5. Global Renewable Energy Employment Structure, 2012–2022

Source: International Renewable Energy Agency (IRENA), Renewable Energy and Jobs report.①

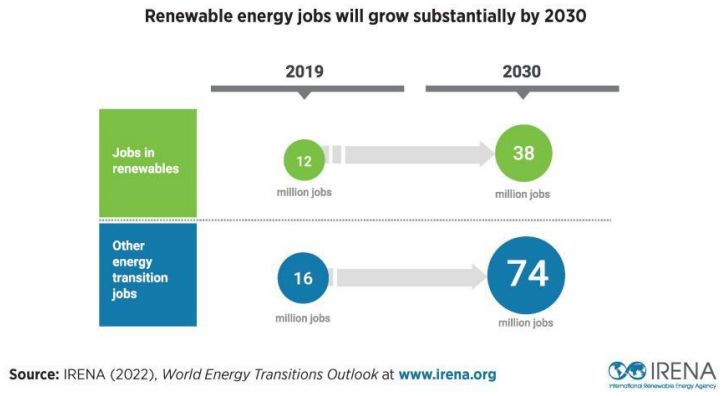


Figure 6. Expected Growth of Global Employment in Renewable Energy – Related Industries by 2030

Source: International Renewable Energy Agency (IRENA). World Energy Transitions Outlook 2022.②

① International Renewable Energy Agency; International Labour Organization. Renewable Energy and Jobs: Annual Review 2023 [EB/OL].[2025-11-26]. https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2023/Sep/IRENA_Renewable_energy_and_jobs_2023.pdf.

② International Renewable Energy Agency. World Energy Transitions Outlook 2022: 1.5°C Pathway [EB/OL]. [2025-11-26]. https://www.irena.org/Digital-Report/World-Energy-Transitions-Outlook-2022.

Second, it is creating trillion-dollar emerging markets. Green trade liberalization paves the way for the commercialization and global deployment of a range of frontier green industries. According to BloombergNEF's Energy Transition Investment Trends 2025 report, global energy transition investment continues to rise, reaching USD 2.08 trillion in 2024; from 2025 to 2030, annual investment will need to average USD 5.6 trillion, and demand will increase sharply after 2030.[①]This explosive investment demand will give rise to a number of trillion-dollar emerging industries worldwide, including green hydrogen, long-duration energy storage, sustainable aviation fuel, direct air capture (DAC), and smart grids. An open and non-discriminatory trade and investment environment is the fundamental prerequisite for these emerging markets to attract global capital, develop unified technical standards, and grow at scale.

II. Challenges: Trade Protectionism and Governance Challenges amid De-globalization

Although green trade liberalization serves as a crucial driver for accelerating the global green transition, the international trade environment is undergoing profound adjustments. Influenced by geopolitical tensions, the restructuring of global supply chains, and the weakening of the multilateral trading system, the development of green trade now faces severe structural challenges. A growing tendency toward "green protectionism", guided by notions of "national security" and "domestic industry first", has become increasingly evident and is creating substantial obstacles to the optimal global allocation of green resources.

1. Intensifying De-globalization Trends and the Rising Costs of Supply Chain Localization

In recent years, the global economic landscape has exhibited clear signs of

① Seven Global Trends in Energy Transition Investment. https://epaper.cnpc.com.cn/sysb/2025-03/23/con-34651.html.

"de-globalization." According to the World Trade Organization's *Annual Trade Monitoring Report under the Trade Policy Review Mechanism*, since 2009, both the value of global trade covered by import-restrictive measures and its share of global imports have shown a rising trend. In figure 7, the blue bars represent the scale of affected trade, while the green line indicates its share of global imports. Together, they illustrates the continuous increase in global trade protectionism of import restrictions over the past decade.

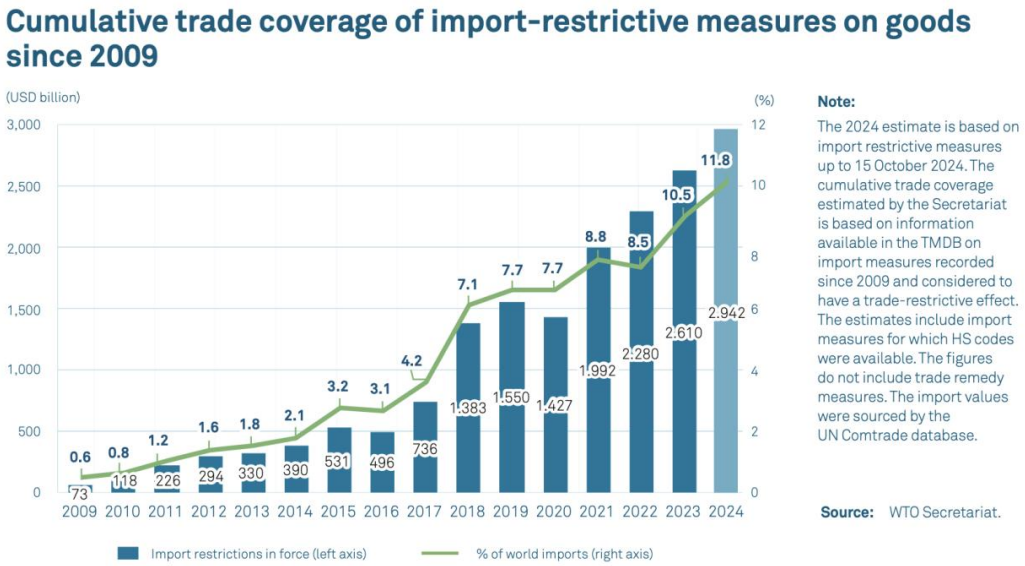


Figure 7. Trade Coverage of Global Import-Restrictive Measures and Their Share in World Imports Since 2009 (WTO)

Source: WTO, Annual Trade Monitoring Report and accompanying factual sheets under the Trade Policy Review Mechanism.①

i. Supply Chain Fragmentation Leading to Rising Costs

New energy industries, such as solar PV, wind power, and electric vehicles, are characterized by highly globalized value chains. However, some advanced economies, driven by the desire to reduce external dependence, have forcibly promoted

① World Trade Organization. WTO Trade Monitoring Report – Factsheet: Cumulative trade coverage of import-restrictive measures on goods since 2009 [EB/OL]. (2024-11) [2025-11-26].https://www.wto.org/english/news_e/news24_e/trdev_13nov24_e.htm.

"manufacturing reshoring" or "nearshoring" through administrative measures. These practices—contrary to the principles of comparative advantage—artificially disrupt previously efficient global production networks, hindering the cross-border allocation of key raw materials (such as lithium, cobalt, and nickel) and critical components. The non-market restructuring of supply chains not only reduces production efficiency but also directly increases the cost of adopting green products and technologies, slowing down the global green transition, particularly in developing countries.

ii. Market Fragmentation Weakening Economies of Scale

The fragmentation of global markets prevents green enterprises from leveraging large, unified global markets to achieve economies of scale. As countries build independent industrial loops, repeated investments and redundant capacities proliferate. This keeps research and development and manufacturing costs high, costs that could otherwise be shared across international markets, and impedes the rapid diffusion of green technologies.

2. Proliferation of "Green Barriers": Rising Risks of Abuse in Trade Remedies and Industrial Policy

With tariff barriers gradually declining, non-tariff barriers (NTBs) and domestic regulatory measures have become the primary constraints on green trade. Meanwhile, the deep integration of climate policy with trade instruments in some countries has triggered widespread concern over the rise of "green protectionism."

i. Hidden Thresholds in Technical Barriers to Trade (TBT)

Some developed economies, leveraging their technological advantages, have formulated complex and non-universal environmental standards, carbon-footprint accounting rules, and conformity assessment procedures. These standards often fail to consider the practical capacities of countries at different development stages and lack

transparency and mutual-recognition mechanisms. For enterprises in developing countries, such asymmetric compliance burdens constitute de facto market entry barriers, limiting their ability to participate in global green value chains.

ii. Discriminatory Subsidy Policies Distorting Fair Competition

New policy tools represented by the U.S. *Inflation Reduction Act* (IRA) and the EU Carbon Border Adjustment Mechanism (CBAM), though framed as climate actions, have raised significant concerns regarding trade fairness.

Exclusivity of subsidies: For instance, the IRA imposes strict local content requirements for electric vehicle tax credits, mandating that battery components and critical minerals must be sourced from North America or specific trade partners. Such requirements are suspected of violating WTO national treatment principles and compel global firms to distort their investment decisions merely to qualify for subsidies, resulting in inefficient flow of global industrial capital.

Controversy over unilateral carbon tariffs: As a unilateral mechanism introduced in the absence of a global carbon pricing regime, CBAM may impose disproportionate burdens on exports from developing countries whose carbon market remain underdeveloped, thereby creating risks of retaliatory trade measures.

3. Restrictions on Technology Exchange Undermining Global Green Innovation Cooperation

Technological innovation is the core driver of green development. However, the current international environment for technology cooperation has become increasingly complex, with geopolitical tensions significantly constraining the free flow of knowledge and technology.

First, export controls on key technologies are becoming normalized. Some countries, expanding the scope of "national security," impose stringent export controls and investment screening measures on technologies crucial for the energy transition,

such as advanced chips, EDA software, and high-end manufacturing equipment. These measures cut off channels for technological spillovers, forcing latecomer countries to undertake redundant research efforts in a technological vacuum, thereby lowering the overall efficiency of global green innovation.

Second, tensions between intellectual property protection and technology diffusion are intensifying. In the green sector, the balance between IP protection and wide technology dissemination is even more delicate. Strict technology blockades and frequent IP disputes restrict developing countries' access to advanced and applicable technologies, exacerbating the "North-South technology divide" at a time when global cooperation is urgently needed to tackle climate change.

4. Weakening of the Multilateral Trading System and the Limited substitutability of Regional Governance Mechanisms

The sustainable growth of global green trade requires strong and effective multilateral rules, yet the current global economic governance system is facing severe stress.

First, the effectiveness of the WTO mechanism has been weakened. The World Trade Organization has shown clear limitations in addressing contemporary green trade disputes. On the one hand, the paralysis of the dispute settlement mechanism, particularly the Appellate Body, has made it difficult for trade disputes among member states to receive legally binding rulings, thereby encouraging the use of unilateral measures. Meanwhile, multilateral trade rules have struggled to keep pace with emerging green policy issues; negotiations under the *Environmental Goods Agreement* (EGA) remain stalled, leaving the international community without unified guidance on carbon border adjustments, environmental subsidies, and other new topics.

Second, regional trade agreements (RTAs) offer only partial solutions. As

multilateral mechanisms stall, countries are turning to regional frameworks. Agreements such as the *Regional Comprehensive Economic Partnership* (RCEP) and the *Comprehensive and Progressive Agreement for Trans-Pacific Partnership* (CPTPP) have indeed facilitated intra-regional tariff reduction and green investment. However, RTAs cannot establish globally unified standards, such as harmonized carbon accounting rules, and divergences among regional regimes may further fragment global markets. Moreover, regional arrangements prioritize member-state interests and cannot systematically address the global public goods deficit in the way that a functioning multilateral system can.

Section III：China's Role and Practices in Green Trade

In the grand landscape of the global green transition, China's role is undergoing a profound and historic transformation. Once known as the "world's factory" and long associated with high energy consumption and high emissions, China is now rapidly emerging as a global hub of green innovation, a key supplier of green products, and an active participant in global green governance. This transformation is not only reshaping China's own economic structure and development trajectory but is also exerting a decisive influence on the global landscape, costs, and future direction of green trade. This section provides an in-depth analysis of China's evolving role and practices in this historic transformation.

I. China's Green Trade Policy Framework and Green Trade Practices

China's development of green trade is grounded in strong national strategic guidance and an increasingly comprehensive policy support system, and it has achieved remarkable achievements in both domestic and international practices.

1. A Comprehensive Policy System: From Top-Level Design to Concrete Implementation

As the world's second-largest economy and the largest trader of goods, China has elevated green development to a core national strategy and has constructed a relatively complete policy framework to support green trade.

At the top-level design stage, China has introduced a number of major policy documents—such as the *Guiding Opinions on Promoting High-Quality Development of Trade* and the *Guidelines for Green Development in Foreign Investment and*

Cooperation—which explicitly call for integrating green principles into all stages of trade and investment. These documents establish strong strategic direction for advancing green trade.

At the implementation level, policy tools have become increasingly targeted and effective. Notably, the newly released *Administrative Measures for Central Budgetary Investments in Energy Conservation and Carbon Reduction Projects* (2025) explicitly provides central fiscal support for energy-saving, carbon-reducing, and circular economy projects in key sectors. This demonstrates China's determination to leverage public investment as a powerful instrument to guide and accelerate the nationwide green transition.

In terms of statistical monitoring, China is actively addressing the long-standing gap in "measurement frameworks" for green trade. The latest Implementation *Opinions on Expanding Green Trade issued by the Ministry of Commerce* in October 2025 propose to "research and establish a continuously improving statistical monitoring and analytical system for green trade" and to "explore statistical and analytical practices relevant to green trade." This indicates that China's green trade governance is transitioning from broad industrial promotion toward a more refined, data-driven approach.

2. Active International Cooperation: Advancing the Green Agenda on Multilateral Platforms

China recognizes that the development of green trade depends on an open and cooperative multilateral environment. Accordingly, China has taken on the role of an active contributor and system builder in international cooperation.

In multilateral negotiations, China is not only an important participant in the WTO Environmental Goods Agreement (EGA) talks but also an advocate for green trade liberalization in platforms such as APEC and BRICS, consistently opposing all forms of green protectionism.

In institutional platform-building, China continues to host world-class exhibitions and forums such as the China International Import Expo (CIIE) and the Hongqiao International Economic Forum, providing global showcases for cutting-edge green products and technologies. At the 8th Hongqiao Forum, the "Open Development" track further highlighted "green and sustainable development," placing green trade and climate cooperation at the core of discussions—once again demonstrating China's openness and determination to drive global green cooperation.

3. Significant Practical Progress: From Product Exports to Integrated Solutions

Despite increasingly complex international rules and rising trade barriers, China has achieved remarkable progress in green trade and accumulated extensive data and successful cases.

The most prominent characteristic of China's green trade development is its comprehensive upgrade from single-product exports to fully greened supply chains and integrated solution offerings.

Table 1. Overview of China's Key Green Products, Green Services, and Industrial Foundations in 2024

Major Area	Representative Categories	2024 Performance & Scale	Data Source / Notes
Green Products	**Green Energy** • Wind power components • Photovoltaic products • Lithium batteries	• Export value of wind power equipment and components increased by 71.9% YoY • PV product exports exceeded RMB 200 billion for four consecutive years • Lithium battery exports reached 3.91 billion units, a record high	General Administration of Customs of China; industry public reports. Indicates China's significant advantages across the green energy supply chain.
	Green Transportation • Electric	• EV exports exceeded 2 million units for the first time • Export value of electric	China Association of Automobile Manufacturers; General

Major Area	Representative Categories	2024 Performance & Scale	Data Source / Notes
	vehicles • Electric two-wheelers	motorcycles and bicycles surpassed RMB 40 billion	Administration of Customs. Reflects explosive global demand for green mobility solutions.
Green Services	**Environmental Rights Trading** • Green Electricity Certificates (GECs)	• Annual GEC trading volume reached 446 million certificates (up 364% YoY) • Cumulative issuance reached 4.955 billion by the end of 2024 • Recognized by international initiatives such as RE100	National Energy Administration. GECs are a core element of market-based environmental rights services, supporting emission reduction in export-oriented supply chains.
	International Green Cooperation • Outward direct investment • Overseas engineering contracting	• USD 2.55 billion in outward direct investment in energy conservation, environmental protection, and clean energy sectors • New overseas engineering contracts in energy-saving, environmental protection, and clean energy reached nearly USD 50 billion, accounting for over 18% of total contracts	Ministry of Commerce. Demonstrates China's transition from product exporter to provider of integrated "products + services + solutions."
	Environmental Industry Services • Technology research and development, consulting, operations	• China's environmental protection industry has maintained annual revenues above RMB 2.2 trillion for three consecutive years	China Environmental Protection Industry Association. A strong industrial base underpins the expansion of green services.
Industrial Foundations	**Green Manufacturing System** • Green factories and industrial parks	• 6,430 national green factories and 491 national green industrial parks established cumulatively • Output of national green factories exceeded 20% of China's total industrial output	Ministry of Industry and Information Technology (MIIT). A robust green manufacturing base ensures upstream support for green trade and green services.

In terms of product exports, growth momentum remains strong. According to the latest data, in the first three quarters of 2025, exports of wind turbine units and components increased by 23.9%[①]; while the export value of photovoltaic products has exceeded RMB 200 billion for four consecutive years[②].

In terms of solution offerings, Chinese enterprises are no longer merely exporting standardized products; instead, they are increasingly providing an integrated "green products + green services" ecosystem that includes green finance, technical consulting, engineering construction, and post-project operation and maintenance. This represents a strategic upgrade from participating in a single value-chain segment to becoming a comprehensive value-chain integrator.

4. China's Substantive Contribution to the World: More Than Just Products

China's contribution to the global green transition extends far beyond supplying affordable and high-quality products; its impact is profound and multidimensional.

First, China serves as a "stabilizer" and "cost reducer" for the global green transition. According to estimates by the International Renewable Energy Agency (IRENA), the levelized cost of electricity (LCOE) for global photovoltaic power has fallen by nearly 90% over the past decade, with more than 60% of this decline attributable to technological progress and large-scale production within the China-centered global PV supply chain. "Made in China" has enabled clean energy to achieve grid parity at unprecedented speed worldwide, significantly reducing the economic cost of achieving global carbon neutrality.

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① State Council Information Office Press Conference on Import and Export Performance in the First Three Quarters of 2025. https://www.cccme.org.cn/news/details.aspx?id=E1B9D156135A80B97AD4288B1AF54A50&classid=8C92359A9456952E&xgid=F868932F64EB7AAF.

② https://paper.people.com.cn/zgnyb/pc/content/202502/17/content_30058311.html.

Second, China is an "enabler" for developing countries. China exports not only to advanced economies but also to a broad range of Global South countries, supplying them with affordable green technologies and products. Under the Belt and Road Initiative, Chinese enterprises have built numerous photovoltaic power stations, wind farms, and hydropower plants in partner countries, helping them establish modern clean energy systems and realize the dual goals of economic development and environmental protection.

Third, China has achieved a transformation from "product exporter" to "solution provider". Chinese enterprises are evolving from supplying standalone products to becoming system integrators capable of delivering comprehensive packages that include investment and financing, technology, equipment, engineering construction, and long-term operations and maintenance. This model effectively addresses the financial, technical, and managerial constraints faced by many developing countries, accelerating the rollout of green projects.

II. China's Competitive Advantages and Challenges in the Green Industry

China's competitive performance in green trade is underpinned by a robust industrial base.

At the same time, however, domestic and international challenges remain significant.

1. Globally Leading Competitive Advantages

After years of development, China has established an unshakable global competitive edge in several key green industry sectors.

In the field of renewable energy, China currently accounts for over 80% of global PV manufacturing capacity, maintaining dominant positions across the entire value chain from polysilicon to module manufacturing. China also leads the world in

wind power equipment manufacturing capacity, particularly in the research, development and manufacturing of large-capacity wind turbines, where it has achieved multiple record-setting advances. The core of this advantage lies in China's ability to build a closed-loop industrial ecosystem characterized by continuous technological self-iteration and persistent cost reduction. In the PV sector, China's dominance is reflected in strong coordination across the entire value chain: from upstream high-purity polysilicon, to midstream solar cells, where China holds more than 95% of the global market and maintains the fastest technology iteration speed, to downstream module production. This robust vertical integration enables China to rapidly commercialize next-generation high-efficiency N-type cell technologies, positioning it as a principal contributor to the nearly 90% reduction in global PV electricity costs over the past decade.

In the wind sector, China has shifted from a follower to a global leader. Beyond cost and scale advantages in onshore wind, China has also made major breakthroughs in the more technologically demanding offshore wind sector. The clearest example is China's astonishing pace in the global race toward turbine "mega-sizing": mainstream turbine models have rapidly progressed from the 5–8 MW range to 16–18 MW. Behind this leap are China's systematic breakthroughs in critical components across the entire supply chain, including ultra-long blades exceeding 100 meters and high-torque gearboxes. These advances are reshaping the global cost curve of renewable energy.

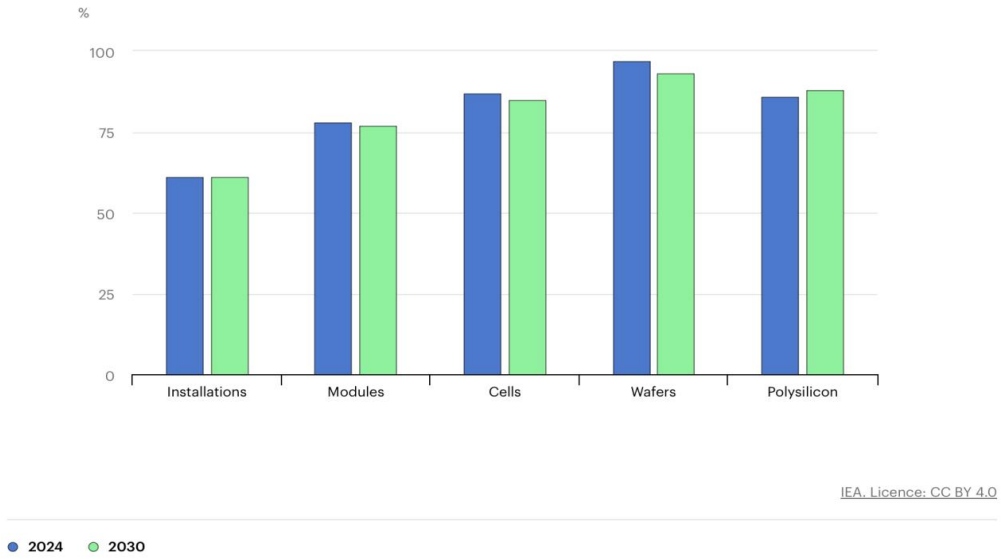

Figure 8. China's Capacity Share Across Segments of the Global Solar Photovoltaic Supply Chain (2024 and 2030 Projections)

Source: International Energy Agency (IEA) ①

In the field of new energy vehicles (NEVs), China has become not only the world's largest production and consumption market but also the global leader in supply chain completeness—especially in power batteries, where it has built a fully integrated closed-loop ecosystem spanning upstream materials, cell manufacturing, and end-of-life recycling. The rise of China's NEV sector is fundamentally rooted in the creation of a highly resilient and exceptionally efficient industrial ecosystem, with the power battery, often regarded as the very heart of the industry, representing the most concentrated embodiment of China's competitive strength. China is home to global battery giants such as CATL and BYD, which together account for nearly half of the global market. More importantly, China has achieved a high degree of autonomy and control over the entire battery value chain. Upstream, China holds more than 60% of the world's refining and processing capacity for critical battery materials. In the midstream manufacturing stage, China's sustained innovation in lithium iron phosphate (LFP) technologies, such as the Blade Battery and cell-to-pack

① International Energy Agency. Solar PV Global Supply Chains [EB/OL]. (2023) [2025-12-04]. https://www.iea.org/reports/solar-pv-global-supply-chains.

(CTP) architecture, has opened a competitive pathway characterized by high safety, long lifecycle, and low cost. Downstream, a nationwide power battery recycling network is rapidly taking shape, enabling the circular use of critical metals. This "cradle-to-cradle" closed-loop system gives Chinese automakers unparalleled advantages in cost control and supply chain stability, positioning China as an indispensable driving force in the global automotive industry's transition toward electrification.

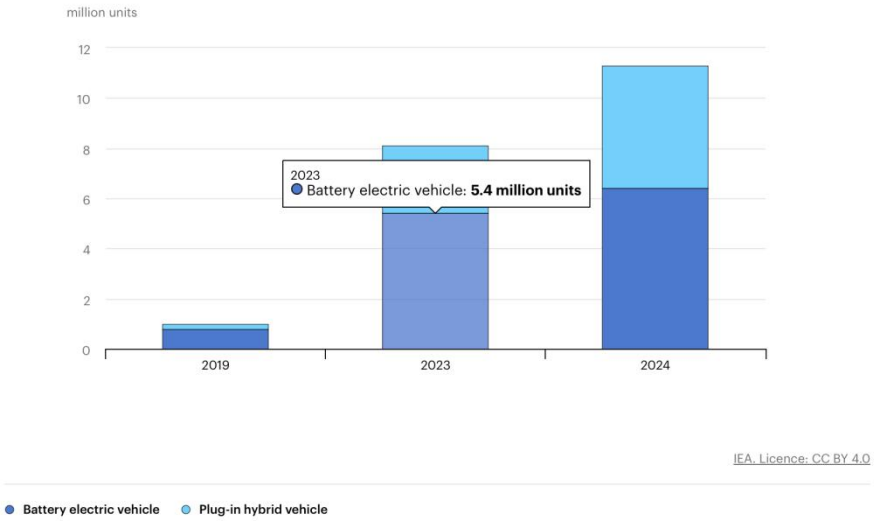

Figure 9. China's New Energy Vehicle Sales and Growth Trends (2019, 2023, 2024)

Source: International Energy Agency (IEA)①

These competitive advantages not only meet China's extensive domestic demand for green transformation but also supply the global market with a large volume of high-quality and relatively low-cost green products, thereby significantly accelerating the global green transition.

2. Multiple Challenges Ahead

Despite remarkable achievements, China's green industries and green trade still

① International Energy Agency. Electric car sales in China, 2019–2024 [EB/OL]. (2025-03-12) [2025-12-04]. https://www.iea.org/data-and-statistics/charts/electric-car-sales-in-china-2019-2024.

face significant challenges.

At the industrial level, certain green products remain positioned at the lower end of the value chain., and China continues to show relatively high external dependence on core technologies (such as advanced chips and industrial software) and critical components (such as specialized bearings). The security and resilience of the industrial chain require further strengthening.

At the external environment level, Chinese enterprises continue to encounter various forms of green trade barriers. For example, the EU's Carbon Border Adjustment Mechanism (CBAM) and the new Battery Regulation, though framed as environmental measures, create stringent requirements and higher compliance costs that create substantial obstacles to China's green product exports. Meanwhile, as more countries introduce their own green industrial support policies (such as the U.S. IRA), international competition facing China's green products is intensifying, requiring continuous industrial upgrading and innovation to maintain global leadership.

III. Global Green Expansion Practices of Chinese Enterprises

In response to the evolving landscape of globalization, leading Chinese green enterprises are integrating their green capabilities with global markets through increasingly diversified and sophisticated pathways.

1. Strategic Integration: Aligning "Green Transformation" with "Internationalization"

In the globalization strategies of Chinese firms, green transformation and internationalization are becoming deeply intertwined.

For instance, TCL's "Glocalization" model combines global resource integration—such as establishing research and development centers worldwide—with localized market responsiveness, including setting up factories in Poland and Mexico to meet regional market demand. TCL's global development path illustrates a shift

from the early stage of "product internationalization" (primarily through exporting standardized products) to a new phase of "hyper-globalization," in which enterprises strategically deploy research, development, manufacturing, and marketing networks worldwide. This enables the global optimization of green innovation resources.

2. Diversified Pathways: Mergers & Acquisitions, Greenfield Investment, and Standards Leadership

Chinese enterprises are pursuing green globalization through a variety of pathways.

First, acquiring advanced green technologies through international mergers and acquisitions.

The most prominent example is Geely's acquisition of Volvo, followed by Geely's strong support for Volvo's transition toward full electrification. This strategic move not only revitalized the Volvo brand but also significantly enhanced Geely's technological capabilities and global reputation in the NEV sector.

Second, establishing overseas green production bases through greenfield investment.

Companies such as Envision Energy and CATL have invested in factories across Europe and North America—not only to be closer to end markets and mitigate trade barriers but also to foster international cooperation in green production and integrate more deeply with local supply chains.

Third, actively participating in international standard-setting.

Enterprises like Huawei and Sungrow, leveraging their technological advantages in PV inverters and smart photovoltaic solutions, have become active contributors in organizations such as the International Electrotechnical Commission (IEC). Their participation helps internationalize Chinese green technologies and standards. These practices not only enhance the global competitiveness of Chinese enterprises but also bring advanced green technologies, investment, and employment opportunities to host countries, generating mutual benefits.

Section IV：Policy Recommendations for Advancing Green Trade Liberalization

Amid the complex landscape in which opportunities and challenges coexist in the process of green trade liberalization, no single-dimensional approach can effectively address the systemic issues at hand. The international community urgently needs to develop a comprehensive, multi-level, and multi-stakeholder collaborative framework to dismantle structural barriers, build global consensus, and restore multilateral trust.

This section proposes policy recommendations across five dimensions—global governance, domestic policy, international cooperation, digital empowerment, and standards development—to guide the global green trade system toward greater openness, inclusiveness, fairness, and efficiency.

I. Accelerating the Improvement of Green Trade Rules under the Multilateral Framework

The central constraint facing the development of green trade today lies in the lagging rulemaking and functional limitations of the multilateral governance system—particularly the WTO-centered framework. Repairing and strengthening the multilateral rules system is the cornerstone for establishing a global green trade order.

1. Building a More Inclusive Multilateral Trade Framework

To overcome institutional barriers, the international community should adhere to the principle of "common but differentiated responsibilities" and strengthen the multilateral framework from the following three dimensions:

First, restart and update the Environmental Goods Agreement (EGA)

negotiations. The prolonged stagnation of the EGA negotiations has increased the cost of global green transition. It is recommended to draw lessons from past experiences and adopt a pragmatic and incremental negotiation strategy—moving away from the pursuit of a one-off comprehensive agreement toward establishing a dynamically adjustable product list. This list should balance the interests of both developed and developing countries, incorporating not only high-tech products such as carbon capture, utilization and storage (CCUS) equipment and high-precision monitoring devices, but also climate adaptation–oriented products urgently needed by developing countries, such as high-efficiency drip irrigation systems and distributed photovoltaics. This would enhance the agreement's inclusiveness and operability.

Second, implement substantive differential treatment mechanisms. Given the diverse stages of green industrial development across countries, rigid "equal-opening" requirements should be avoided. Next-generation trade agreements should include robust Special and Differential Treatment (S&DT) provisions, granting developing countries longer transition periods and more flexible timetables for market opening. Within the bounds of WTO rules, they should also retain moderate policy space—such as in government procurement—to support their emerging green industries and protect them from premature exposure to competition from mature markets.

Third, establish a "code of good practice" for mutual recognition of green standards. To address the proliferation of technical barriers to trade (TBT) due to inconsistent standards, a green standards mutual-recognition mechanism should be promoted under the WTO framework. Members should be encouraged to adopt multilateral or bilateral Mutual Recognition Agreements (MRAs) covering environmental labels (e.g., China's Ten-Ring Certification, the EU Ecolabel), energy-efficiency ratings, and carbon-footprint verification. Achieving "one certification, multi-country acceptance" would significantly reduce compliance and transaction costs for enterprises.

2. Strengthening the Coordination Between Trade and Environmental Policies to Prevent the Distortion of Unilateral Measures

To prevent the spread of "green protectionism", it is essential to enhance multilateral oversight and coordination regarding unilateral environment-related trade measures.

First, establish non-discriminatory principles for policy implementation. When designing carbon border adjustment mechanisms (CBAM), green subsidies, or other environment-related trade measures, countries must strictly adhere to the WTO's non-discrimination principles—namely, national treatment and most-favoured-nation (MFN) treatment. Policy design should ensure transparency and incorporate advance notification and review mechanisms. Meanwhile, when developed countries introduce high-standard environmental policies, they should provide corresponding technical assistance and capacity-building support to help developing countries improve compliance capabilities, thereby avoiding de facto market-entry barriers.

Second, explore the establishment of a fast-track mechanism for resolving environment-related trade disputes. Given that green trade disputes are characterized by both technical complexity and time sensitivity, it is recommended that a dedicated expert panel or fast-track dispute-settlement channel be established within the WTO.

This mechanism should involve experts with dual backgrounds in environmental science and trade law, and—while safeguarding the authority of the multilateral rules system—seek to balance environmental protection rights with trade-liberalization obligations, preventing the abuse of unilateral trade-remedy measures.

II. Optimizing Domestic Policy Support Systems

The effective implementation of multilateral rules requires strong domestic

policy foundations. Countries should, based on their own resource endowments, build policy systems that align with international rules while effectively stimulating market vitality.

1. Designing Domestic Policy Frameworks That Promote Green Trade Development

First, leverage the multiplier effect of public fiscal funds. Drawing on practices such as China's Administrative Measures for Central Government Budget Investment for Energy-Saving and Carbon-Reduction Projects, governments should optimize fiscal expenditure structures and provide targeted support for green technology, low-carbon process upgrading, and green supply-chain development. Through instruments such as tax credits and research and development subsidies, governments can reduce the sunk costs associated with corporate green transition and help channel social resources into green and low-carbon sectors.

Second, improve the green finance system. Governments should vigorously expand green credit, green bonds, and green insurance markets, while strengthening green finance standards and regulatory systems. By offering risk-sharing mechanisms (such as government guarantees) and improving the investment and financing environment, private capital can be mobilized at scale to participate in green industries, providing enterprises with low-cost and long-tenor financing.

Third, establish a one-stop green trade service platform. To address information asymmetries faced by enterprises expanding abroad, governments should collaborate with industry associations to build public service platforms. These platforms should offer information on environmental regulations, market-entry standards, certification procedures, and trade-risk alerts of target markets, helping enterprises, particularly small and medium-sized firms, lower their barriers to international market entry.

2. Optimizing China's Green Trade Policies

As the world's largest producer and trader of green products, China should deepen policy innovation in the following areas:

First, upgrade industries from "cost advantages" to "technology advantages". Under the guidance of the "dual-carbon" goals, China should strengthen the integration of industry, academia, research, and application, focusing national resources on overcoming bottleneck technologies in areas such as energy-storage materials, core components, and industrial software. This will enhance the technological value and global brand influence of green products. At the same time, China should optimize its export structure by strictly limiting the export of high-energy-consumption and high-emission primary products, while vigorously developing green technology and services trade.

Second, build full life-cycle green supply chains. Industry-leading enterprises should be encouraged to play the role of "chain leaders", establishing green supply-chain management systems covering procurement, production, logistics, and recycling. China should actively participate in international rulemaking, transforming its industrial practices in sectors such as new energy vehicles and photovoltaics into proposals for international standards, thereby strengthening China's voice in global green governance.

III. Strengthening International Cooperation and Knowledge Sharing

Facing the global climate crisis, zero-sum games offer no solution. International cooperation is essential to advancing green trade liberalization.

1. Key Drivers for Promoting Green Trade Liberalization

First, deepen North–South cooperation and fulfill technology-assistance

commitments. Developed countries should genuinely implement the commitments under the Paris Agreement by transferring environmentally friendly technologies to developing countries through joint research, development. patent licensing and expert deployment. They should refrain from using intellectual property rights as an excuse to impose additional market barriers that hinder the global diffusion of green technologies.

Second, expand South–South cooperation and the Belt and Road Initiative. Leveraging similarities in resource endowments and development stages among developing countries, China should promote highly applicable green solutions. Through the Belt and Road Initiative, cooperation should be strengthened in distributed energy, low-cost pollution control, green agriculture, and other areas. Establishing green-trade demonstration zones can enhance the green-development capacity of the Global South.

Third, enhance policy coordination among major economies. Support WTO, UNCTAD, UNEP, and other international organizations in conducting policy dialogues. Particularly, China, the United States, and the European Union should establish regular communication mechanisms to coordinate on key issues such as subsidy policies and carbon-pricing mechanisms, reducing trade frictions stemming from policy spillovers.

2. Leveraging International Platforms as Bridges for Cooperation

China should make full use of high-level platforms such as the China International Import Expo (CIIE) and the Hongqiao International Economic Forum to build new hubs for global green-trade dialogue and cooperation.

As one of the largest and highest-level import-themed expos in the world, CIIE naturally brings together global green supply and demand. By establishing thematic sections such as "Green Trade," "Green Technologies and Innovation," and "Zero-Carbon Supply Chains," CIIE can not only showcase frontier green solutions in

the world—including next-generation photovoltaics, advanced energy storage, green hydrogen, and digital carbon-management tools—but also serve as a systematic platform for governments, international organizations, multinational enterprises, and think-tank scholars to engage deeply in discussions on green-trade rules.

The Hongqiao International Economic Forum, the "intellectual engine" of CIIE, has become an important public good for multilateralism, open cooperation, and trade-policy coordination. Its sub-forums under themes such as "Open Development" and "Green and Sustainable Development" provide institutionalized venues for agenda-setting, policy advocacy, and rule innovation in global green-trade governance. For example, issues such as "international mutual recognition of green standards," "low-carbon supply-chain development," and "green finance and investment mechanisms" can be prioritized for future discussions, allowing continuous dialogue to build cross-country consensus and generate replicable, scalable institutional outcomes.

On this basis, it is recommended to use such comprehensive international platforms to advocate for the establishment of a Global Green Technology Sharing Mechanism. This mechanism should be based on the principle of ‘balancing intellectual property protection with accessibility'. It should protect innovators' rights while lowering access costs for developing countries through differentiated licensing, tiered authorization, and green-cooperation funds. Drawing on the "patent pool" model in the pharmaceutical sector, a Green Technology Patent Pool could be created by multilateral institutions to make selected patents in renewable-energy equipment, energy-efficiency retrofits, water-saving agriculture, and climate-adaptation technologies available to developing countries at reasonable fees.

Furthermore, the platform mechanism could coordinate with existing international financing instruments—such as the Belt and Road Green Development Initiative, the South–South Cooperation Assistance Fund, and the World Bank's Climate Investment Funds (CIF)—to provide financial support for developing countries in introducing, adapting, and localizing low-carbon technologies.

Multinational enterprises should also be guided to implement demonstration projects under this mechanism, offering integrated packages of technology + equipment + standards + operations, helping more developing countries build green-industry capacities and enhancing their participation and competitiveness in the global green-trade system.

IV. Leveraging Digital Technologies to Empower Green Trade

Digitalization is an accelerator of greening. Deeply integrating digital technologies with green trade will provide strong technical support for improving trade transparency and efficiency.

1. Enhancing Transparency and Credibility Across the Entire Trade Chain

Blockchain, Internet of Things (IoT), and other technologies should be widely promoted in green supply-chain management to build tamper-proof, full life-cycle traceability systems. Carbon emissions and energy-consumption data from raw-material extraction, production and processing, logistics and transportation, and recycling should be recorded and archived in real time. This not only helps effectively combat greenwashing but also provides reliable data support for carbon-footprint certification and green labeling.

2. Developing Digital Green-Trade Platforms to Reduce Transaction Costs

The development of cross-border e-commerce and digital services trade should be accelerated to reduce the transaction and circulation costs of green products. Building online marketplaces for green-technology transactions can remove

geographical barriers and promote the global flow of innovative resources. Meanwhile, countries should strengthen coordination on digital-trade rules and, under the premise of safeguarding national data security and personal privacy, establish mechanisms for managing cross-border data flows to ensure the smooth circulation of data needed for product traceability and carbon accounting.

V. Accelerating the Development of a Global Unified Coding System

The absence of standardized classification is one of the root causes of disorder and friction in current green trade. Establishing a global unified coding system is a foundational project for making green trade more rule-based and transparent.

1. Taking the Lead in Formulating Chinese Standards and Contributing "China's Proposal"

Given that global consensus on unified standards is unlikely in the short term, China—as the world's largest producer and trader of green products—should take proactive steps. It is recommended that the Ministry of Commerce and the General Administration of Customs jointly lead efforts with top think tanks and industry associations to develop a "China Green Trade Statistical Classification Reference Standard" that is internationally compatible while reflecting China's national conditions. This work directly echoes the tasks outlined in the Implementation Opinions on Expanding Green Trade. The resulting framework can guide domestic policymaking and contribute an evidence-based "China solution" to future international negotiations.

2. Promoting Mutual Recognition in Key Sectors to Drive Broader Consensus

Since pursuing a fully unified global system is unrealistic at this stage, a pragmatic approach should be taken. Priority should be given to sectors where China holds clear industrial advantages, such as photovoltaics, wind power, and new-energy vehicles, or sectors involving globally prioritized resources such as recycled metals. China should actively promote bilateral or plurilateral mutual-recognition arrangements with major trading partners on standards, certification, and labeling. Breakthroughs in these focal areas can generate demonstration effects, thereby expanding consensus gradually from point to area.

3. Actively Participating in International Rulemaking and Promoting a "Living List" Approach

China should make greater use of international platforms such as the WTO and APEC to bring domestic research findings and practical experience into global discussions. China can advocate for and participate in the development of a globally unified green-trade coding framework and promote the establishment of a "living list" mechanism—allowing the classification system to be regularly updated and dynamically adjusted to accommodate rapid technological iteration and innovation in green sectors.

4. Strengthening the Data Foundation and Analytical Research

A unified classification system requires a strong data foundation. Domestic and international research institutions should be encouraged to conduct deep cleaning and enhancement of global trade databases such as UN Comtrade, identifying and tagging potential green products to support the creation of a more reliable classification

framework. Institutions such as the Chinese Academy of Sciences are already engaged in improving foundational international-trade datasets, and such fundamental public-good efforts should continue to receive strong support.

Section V：Outlook

Human society is entering an era of green transition filled with both challenges and promise. This profound transformation, driven primarily by the imperative to address climate change, is comparable in scope, depth, and impact to the most significant industrial revolutions in history. Within this sweeping transformation, green trade has moved unmistakably from the periphery to the center. As the key link connecting global innovation, production, and consumption, it has become a decisive variable shaping the success or failure of the global green transition. Following a systematic analysis of global green trade trends, opportunities and challenges, China's role, and future pathways, this chapter provides an outlook and summary of the road ahead.

I. The Inevitable Outlook for Global Green Transition and Green Trade Liberalization

The global green transition is an urgent task that concerns the shared future of humanity, while the liberalization of green trade serves as a critical lever for accelerating this process. This core conclusion reflects a deep insight of the severe climate realities facing the world today, as well as the internal logic of achieving the Sustainable Development Goals.

As noted in the introduction to this report, the continued rise in global temperatures is no longer a distant risk but an ongoing crisis. The resulting surge in extreme weather events is directly threatening global economic stability, food security, and human well-being. Against this backdrop, accelerating the green transition—centered on clean energy development and low-carbon economic transformation—is not only the best choice for the international community but the only correct one.

However, one of the greatest obstacles to this transition lies in the substantial

costs and the wide technological divide. Green trade liberalization offers the most effective and market-consistent tool for addressing these challenges. By lowering trade barriers for green products and technologies, the international community can allocate global green innovation resources more efficiently, reduce global mitigation costs, and strengthen the ability of all countries—especially developing countries—to respond to climate change. Its transmission mechanisms and transformative potential can be understood on several levels:

First, green trade functions as a "cost reducer" for global emissions mitigation. Free trade promotes global specialization and cooperation, maximizing economies of scale and learning-curve effects. As analyzed in detail in Part III of this report, China's photovoltaic industry provides a compelling example. A globally open market enabled China to translate its manufacturing capacity and continuous technological innovation into affordable clean electricity for the world, reducing the levelized cost of solar power by nearly 90% over the past decade. Removing remaining tariff and non-tariff barriers will further accelerate this trend, enabling key green product, such as wind turbines, electric vehicles, and energy-storage systems, to benefit consumers worldwide at lower prices. This allows the same amount of capital to deliver larger emissions reductions, thereby directly reducing the overall global economic cost of achieving the Paris Agreement targets.

Second, green trade acts as an "optimizer" of global green innovation resources. An open trade and investment environment directs capital, technology, and talent toward regions and industries where they can be used most efficiently and create the greatest value, thereby fostering a dynamic global green value chain. Through competition and cooperation, firms across countries are incentivized to continuously pursue technological advancement and business-model innovation, accelerating the upgrading of the global green technology ecosystem. Conversely, protectionist barriers fragment markets, lead to inefficient duplication, and weaken incentives for innovation.

Third, green trade serves as an "enabler" of capacity building in developing

countries. Developing countries are among the most direct victims of climate change yet often lack the financial resources and technologies needed for effective response. Green trade liberalization allows them to access advanced clean-energy technologies, water-efficient irrigation systems, disaster-early-warning equipment, and more at affordable costs. This supports them in pursuing economic development while building more climate-resilient societies and advancing the United Nations Sustainable Development Goals.

At present, although green trade liberalization faces headwinds such as the rise of "green protectionism" and intensifying geopolitical competition, the outlook remains promising as global consensus on green development continues to strengthen and disruptive green technologies continue to advance. These challenges are temporary, while the long-term trajectory toward green development is irreversible. The "hard constraints" of climate and the "hard logic" of technological progress will ultimately breaking through the "soft barriers" of protectionism and keeping the global green trade vessel moving forward.

II. China's Role and Commitment in Advancing Global Green Trade Liberalization

As a major participant and contributor to global green trade, China is well positioned to play a greater role in promoting green trade liberalization by leveraging the mutually reinforcing dynamics of its domestic and international "dual circulation". China is not a bystander or a passive recipient, but a core actor that has deeply integrated into—and is actively shaping—the global landscape of green trade. Anchored in its new development paradigm, China possesses both the capacity and the responsibility to assume a greater role in global green governance.

Domestically, continuing to optimize green industrial policies and improving systems that facilitate green trade form the foundation of China's domestic "internal circulation" for contributing to global progress.

At the industrial-policy level, China—guided by its "dual carbon" strategic goals—has shifted from pursuing sheer expansion of scale to prioritizing quality enhancement and greater resilience and security. This requires sustained investment in basic research and critical technologies, addressing bottlenecks in high-end materials, core components, and industrial software, and elevating China's position within global green value chains. It also calls for accelerating the establishment of a comprehensive green supply chain management system that covers raw material procurement, production, consumption, and recycling, thereby strengthening the overall sustainable competitiveness of its green industries.

At the trade-facilitation level, China should expedite the alignment of its green trade standards, certification systems, and statistical-monitoring mechanisms with international norms. As recommended in Part IV, taking the lead in establishing a scientific "China Green Trade Statistical Classification Reference Standard" would not only improve the precision of domestic policymaking but also provide a well-founded "Chinese proposal" for future international negotiations. In addition, the government should continue to build high-quality public service platforms that offer one-stop services—such as overseas market environmental standards, compliance requirements, and risk alerts—for enterprises, especially small and medium-sized firms entering overseas markets.

Internationally, deepening multilateral, regional, and bilateral green cooperation and fostering fair and inclusive global green trade rules constitute the "external circulation" through which China can exercise greater global influence.

At the multilateral level, China should continue to firmly safeguard the WTO-centered multilateral trading system, actively promote the resumption and upgrading of Environmental Goods Agreement (EGA) negotiations, and advance constructive proposals in new platforms such as the Trade and Environmental Sustainability Structured Discussions (TESSD), particularly on issues such as regulating unilateral environmental measures and establishing mechanisms for mutual recognition of policy "equivalence".

At the regional and bilateral levels, China should promote deeper green cooperation under frameworks such as the Regional Comprehensive Economic Partnership (RCEP) and pursue high-standard free trade agreements with more partners, making green trade and sustainable development key chapters within those arrangements.

Through hosting major events such as the China International Import Expo (CIIE) and the Hongqiao International Economic Forum, China is opening new spaces for global dialogue and cooperation on green development. These platforms not only serve as global launchpads and showcase venues for green technologies and products, but also provide invaluable arenas where policymakers, business leaders, and scholars discuss key issues—including green trade rules, standards harmonization, and supply chain cooperation—and build consensus. China should continue to leverage these platforms to demonstrate its commitment to building an open world economy and a clean, beautiful world.

III. Joint Actions and Shared Vision for the Future of Humanity

Looking ahead, as the global green transition accelerates and new technologies continue to emerge, the scope and content of green trade will expand significantly. As analyzed in this report, future competition will shift from the products themselves to the standards, data, and services underpinning them. Service sectors such as carbon-footprint management, green finance, and circular-economy solutions will grow in importance. Digital green trade, underpinned by emerging technologies including blockchain, the Internet of Things (IoT) and artificial intelligence (AI), is poised to exert a profound transformative impact on the structure and operational efficiency of the global trade system.

In this rapidly evolving environment, isolationism and protectionism run counter to the tide of history and offer no viable path forward. Governments, businesses, and

international organizations must uphold the vision of a community with a shared future for humankind, remain committed to multilateralism, dismantle green trade barriers, and work together to build a cleaner and more beautiful world, thereby achieving the global climate objectives set in the Paris Agreement and creating a more sustainable future for generations to come.

For governments, this requires demonstrating foresight and resolve beyond short-term domestic political interests, placing climate security and sustainable development at the top of the international agenda. It calls for the restoration of confidence in multilateralism, a return to the negotiating table, and collective endeavors to establish a new global green trade governance order that balances the right to development with environmental obligations and reconciles innovation incentives with equity guarantees.

For global enterprises, this means embedding ESG (environmental, social, and governance) principles deeply into corporate strategy and daily operations. Firms must not only pursue their own green and low-carbon transitions but also drive emissions reductions across their supply chains, turning sustainability into a core source of long-term competitiveness.

For international organizations, this means playing a more active role as knowledge hubs, coordination platforms, and guardians of global rules. Institutions such as the WTO, UNCTAD, and UNEP should enhance cooperation to provide more authoritative data analytics, more rigorous policy recommendations, and more impartial dispute-settlement mechanisms for global green trade.

In sum, advancing green trade liberalization is not a zero-sum contest but a positive-sum endeavor from which all participants can benefit. It is not merely a commercial choice tied to economic growth, but a moral imperative concerning the shared destiny of humanity and the well-being of future generations. There is only one Earth, and all nations inhabit a common world. Only through openness, cooperation, and mutual benefit—by jointly dismantling barriers and sharing the fruits of green innovation—can we seize the historic opportunity presented by the green transition,

turn the vision of the Paris Agreement into reality, and safeguard our blue planet, leaving behind a clean, beautiful, and prosperous sustainable future for generations to come.

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About CCG and Our Team

About CCG

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