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China's Green Leap Outward: The rapid scale-up of overseas Chinese clean-tech manufacturing investments

A rapid acceleration in overseas investment by Chinese green technology manufacturers is reshaping the global clean-tech landscape. Since 2022 alone, investments have surged past USD 220 billion, spanning sectors such as batteries, solar, wind, new energy vehicles (NEVs), and green hydrogen. These investments now reach 54 countries across every major region. This policy brief offers the first comprehensive overview of China's expanding global green manufacturing footprint, drawing upon our database.

MAIN FINDINGS

- **Investment volume:** Chinese firms have pledged at least USD 227 billion across green manufacturing projects. A high-end estimate approaches USD 250 billion. This surge of overseas green manufacturing investment is unprecedented; it now surpasses the USD 200 billion (in current 2024 dollars) invested by the US over four years of the Marshall Plan, at a time of similar American dominance of manufacturing in key industries.

- **Post-2022 acceleration:** Investments surged beginning in 2022, with 387 projects—over 80% of the total—launched since that year. A record 165 projects were announced in 2024 alone. Since 2022, Chinese firms have committed over USD 210 billion, accounting for approximately 88% of total disclosed capital.
- **Sector diversification:** Solar dominated pre-COVID, but since 2021, capital has fanned out to battery materials, full battery plants, New Energy Vehicle's (NEV), charging equipment, wind, and early-stage green hydrogen.
- **Regional re-balancing:** ASEAN still hosts the most projects, yet 2024 saw MENA's share jump to over 20 % of new deals; Europe remains key for downstream batteries, while Latin America and Central Asia enter the map.
- **Hot-spots:**
 - Indonesia—linchpin for nickel-rich battery-material projects and new solar lines.
 - Morocco—cathodes and green-hydrogen for EU supply chains.
 - Gulf states—solar module and electrolyser manufacturing backed by sovereign offtakes.
 - Hungary, Spain, Brazil, and Egypt—sector-specific hubs for batteries, hydrogen, or mixed clean-tech plays.
- The geographic distribution suggests that investment motivations can be categorized into three types: Seeking access to host countries markets, access to third-country markets, or access to raw material inputs.
- **Megaprojects:** Chinese investments include 60 projects exceeding USD 1 billion.

THE CHINA LOW-CARBON TECHNOLOGY FDI DATABASE

China's manufacturers have become pivotal actors in the global clean-tech transition, building battery, solar-PV, wind-turbine, and electric-vehicle manufacturing plants across the world. Tracking this industrial footprint is increasingly essential for assessing the social, economic, and environmental consequences of China's role in global supply chains.

To provide a rigorous empirical basis for such assessments, the China Low Carbon Technology FDI Database was launched in early 2025. The database is a preliminary part of the broader Global Low Carbon Technology FDI database, hosted by NZIPL at Johns Hopkins University and GDP Center at Boston University.



The database catalogues 461 green-technology manufacturing projects announced between 2011 and the first half of 2025 (**methodology in appendix**).

The 11 low carbon technology types in the database are: batteries, battery materials, charging infrastructure, electric buses, electric motorcycles, green hydrogen, new energy vehicles (NEVs), NEV parts, solar, storage, and wind. Projects are, most centrally, mapped by year, country, clean technology type, company, investment scale, production capacity, and project status.

By harmonizing disparate open-source datasets with manual verification, the database offers the most comprehensive, up-to-date map of Chinese green-tech manufacturing investment abroad. Its temporal, geographical, and sectoral granularity enables researchers to trace financing waves, identify emerging hubs, and evaluate how the timing and composition of Chinese manufacturing commitments shape development outcomes.

To cover a bigger scope, the China Low Carbon Technology FDI database will be incorporated into the Global Low Carbon Industrial FDI database, on outward green manufacturing investments from all countries. These combined databases are under development and will be made publicly available in an academic publication in Q1 2026, and will be updated at frequent intervals. The intention of these databases is to allow policymakers, financiers, and researchers to track these dynamics and assess how China's industrial choices reshape the global decarbonization landscape.

INVESTMENTS

Figures 1 and 2 present a comprehensive overview of the annual disclosed investment amounts in green technology manufacturing projects by Chinese companies, disaggregated by sector, region, and project status.

A clear trend emerges: investment volumes have surged dramatically since 2022. Approximately 88% of all recorded investment has occurred since that year, and in each year since 2022, the pledged investment exceeded the total amount committed over the entire previous decade.

Our database captures a total of USD 227 billion in projects with identified or estimated investment amounts, representing roughly 85% of all recorded projects. By incorporating a conservative estimate for the remaining 15% of projects with insufficient data—the combined high-end estimate reaches nearly USD 250 billion, with over USD 210 billion concentrated in the post-2022 period alone. Notably, because subsequent expansions are recorded under the project's initial announcement year, much of the pledged investment from pre-2022 solar projects likely materialized after 2022, when capacity ramp-ups accelerated. Taken together, the data reveal an unprecedented surge in Chinese green manufacturing FDI since 2022, mobilizing vast capital across more than 50 host countries.



Figure 1. Total investment in Chinese overseas green manufacturing projects by technology and project status

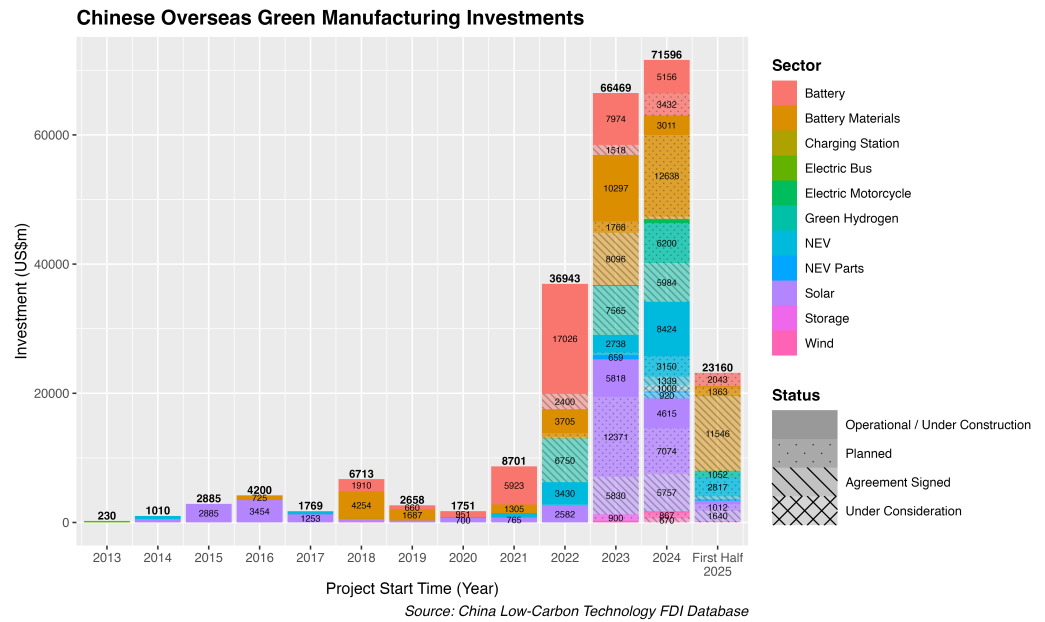


Figure 2. Total investment in Chinese overseas green manufacturing projects by region and project status

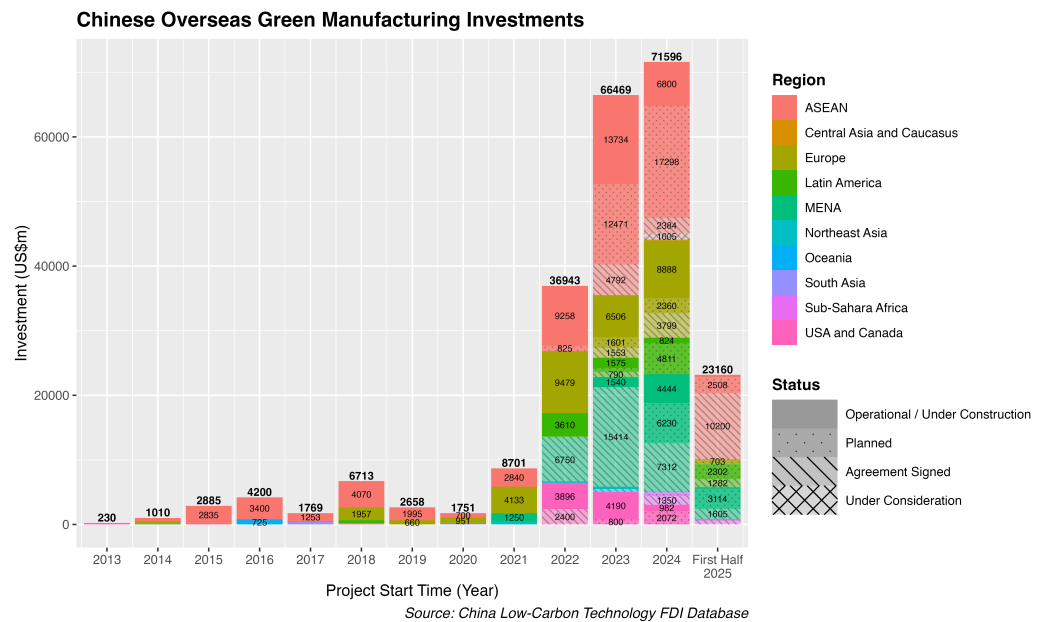
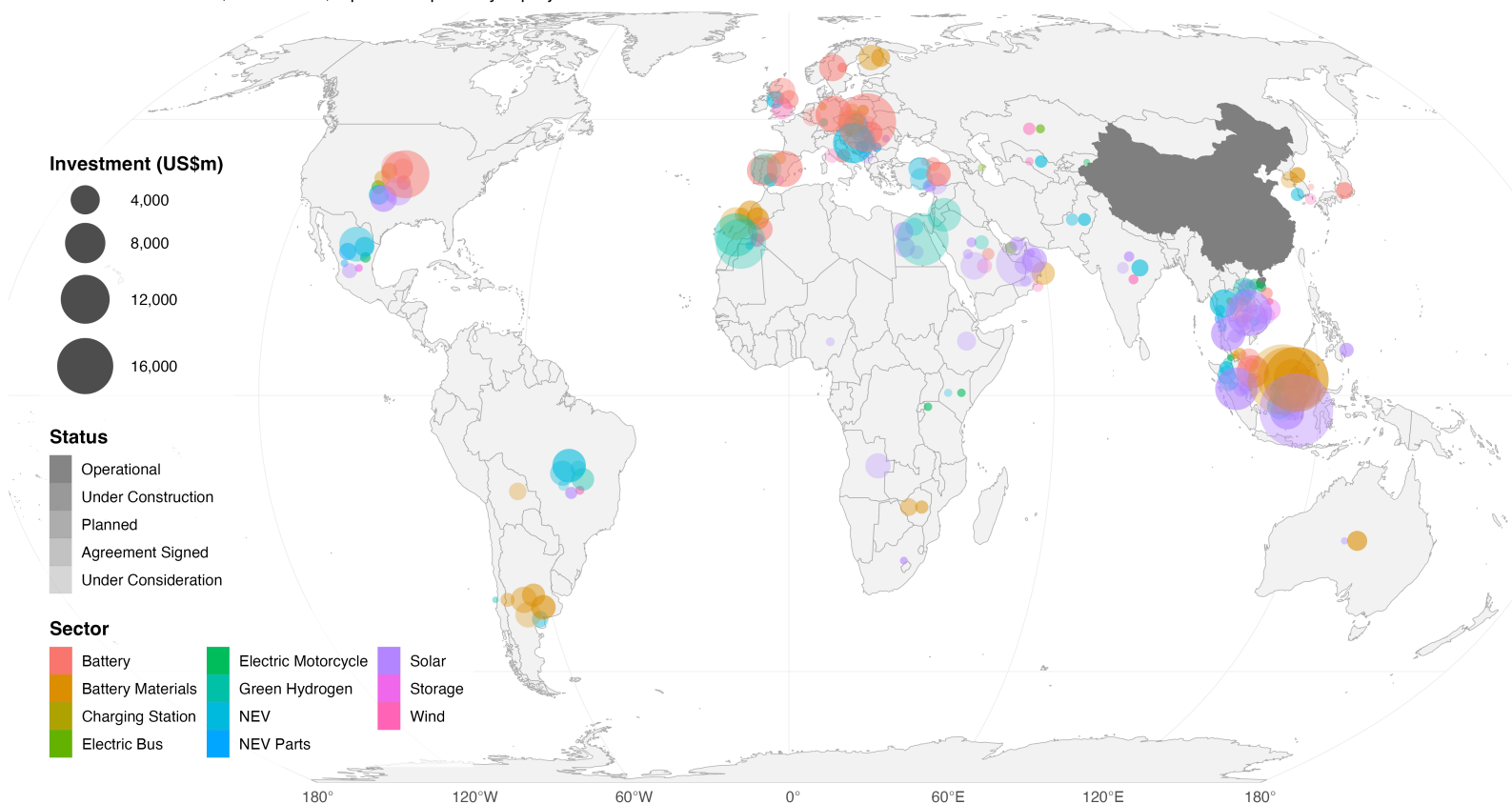


Figure 3. Global Distribution of Chinese overseas green manufacturing projects by technology and project status

Chinese Green Manufacturing Investments Overseas

Bubble size ∝ investment; fill = sector; alpha transparency = project status



Source: China Low-Carbon Technology FDI Database

The figures also reveal pronounced disparities. Some technologies and regions dominate funding while others attract comparatively little, underscoring how corporate strategies, policy incentives, and resource endowments are steering Chinese firms toward specific value-chain segments and geographies. Understanding these disparities is critical for host governments and partners seeking to position themselves within the next wave of China-linked clean-industry investment.

By the sheer number of projects (rather than investment amounts), the surge is equally clear. From 2011 to 2021, only 81 projects were recorded. In contrast, 46 new projects were initiated in 2022, followed by a steep increase to 115 in 2023 and an unprecedented 165 in 2024. In total, over 80% of the projects in the database by the end of 2024 were launched after 2022, with 2024 alone accounting for over 35% of the total dataset.

TECHNOLOGIES

China's overseas clean-tech portfolio has diversified sharply. Before the pandemic, outbound capital flowed overwhelmingly into solar manufacturing, but beginning in 2021, it spread rapidly across the broader low carbon-technology value chain—from battery materials and full battery plants to New Energy Vehicles (NEVs), charging equipment, and green-hydrogen projects—reflecting a strategic shift toward end-to-end coverage of critical decarbonization industries.

Solar manufacturing remains a major part of China's outward green-tech portfolio. As **Figure 3 and 4** show, more than USD 57 billion—spread across 135 projects with

disclosed investment data—has been committed to overseas solar plants. ASEAN absorbs the bulk of this capital, benefiting from its re-export hub status, proximity to Chinese supply chains, and a business environment familiar to Chinese investors. Momentum, however, has begun to shift toward the MENA region, where a growing pipeline of signed and planned projects reflects the draw of robust industrial incentives, world-class solar resources, and strategic state-level partnerships. A notable share has also flown to the United States, where Chinese firms are setting up local production to retain market access while navigating tariffs and domestic-content rules.

Battery-materials manufacturing now represents the single largest slice of China's overseas green-tech spend. Once 2025 deals are included, disclosed commitments top USD 62 billion, even though the sector counts only slightly over half as many projects as solar. The gap underscores the capital intensity of mineral processing and precursor plants, which demand far higher outlays per facility than downstream assembly lines. Investment is heavily skewed toward ASEAN—above all Indonesia, whose nickel and cobalt reserves anchor a regional hub—but Chinese firms are also moving upstream in Latin America's Lithium Triangle (Chile, Bolivia, and Argentina), tightening control over the full battery value chain. At the same time, Morocco has emerged as MENA's breakout location for cathode and precursor projects, leveraging its own mineral base, duty-free access to the EU, and an assertive industrial-policy toolkit.

Investments in **battery manufacturing** also feature prominently, with high unit costs reflecting the capital intensity of gigafactory development. These investments are heavily concentrated in Europe, where regulatory incentives, strong market demand, and geopolitical considerations encourage Chinese firms to localize production. Notably, most European battery projects are confirmed, indicating more advanced implementation compared to other regions. Smaller numbers of projects are also found in the United States and ASEAN on a more limited scale.

Green hydrogen stands out as the most capital-intensive segment of China's clean-tech manufacturing push, with an average project size of approximately USD 2 billion, despite only a limited number of announced ventures. Given that several recent projects lack disclosed capacity or investment numbers, the sector's overall investment footprint could be even larger. Chinese developers are pursuing both large-scale green hydrogen and green ammonia complexes, as well as electrolyser manufacturing plants—critical upstream components for the hydrogen value chain. Most projects remain at the planning stage, highlighting the sector's early-phase development. The MENA region anchors China's offshore hydrogen strategy, offering world-class solar and wind resources alongside supportive policy environments. Meanwhile, emerging proposals in Latin America (particularly Brazil) and Europe (notably Spain) indicate a steadily expanding geographic footprint.

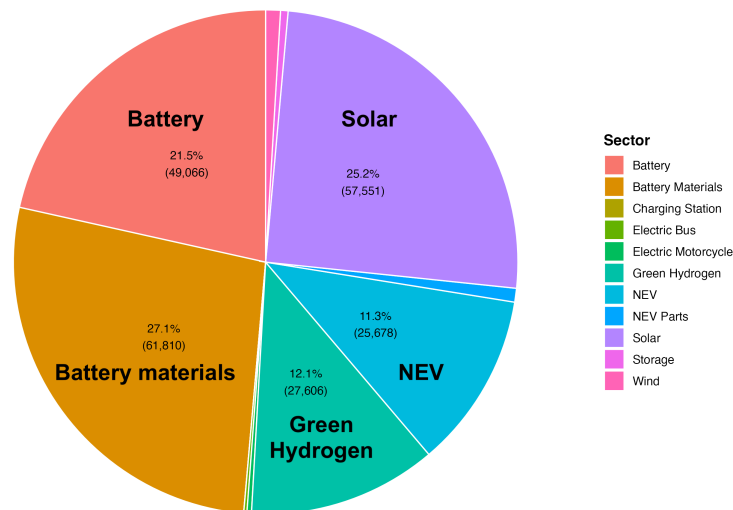
NEV manufacturing is more geographically diversified. ASEAN and Europe attract the largest shares, while MENA and Latin America are gaining momentum; no NEV plants are recorded in the United States, reflecting trade barriers and strategic caution. ASEAN offers low costs and preferential access to regional markets, whereas in Europe, Chinese automakers—together with Volvo under Chinese ownership—are scaling local capacity to meet soaring EV demand and comply with rules of origin.

Wind projects show a similarly balanced spread: every major region except the United States and Sub-Saharan Africa hosts a few plants. Central Asia has the most projects so far, and established turbine markets such as Brazil and India continue to draw Chinese capital. This footprint indicates that site selection is driven chiefly by resource endowments, market depth, and existing customer bases.



Sectors such as **electric buses, electric motorcycles, charging stations, storage, and NEV parts** account for smaller shares of total investment. These segments often serve niche markets or function as complements to broader sectoral strategies, further contributing to the diversification of China's global green manufacturing ecosystem.

Figure 4. Sectoral share of total Chinese green manufacturing overseas investment (in millions of US dollars)



GEOGRAPHIES

As shown in **Figure 3**, the geographic distribution of Chinese overseas green technology manufacturing investments reveals the emergence of regional hotspots.

The ASEAN region has consistently been the primary destination, accounting for about half of the projects in the years prior to 2024. This sustained dominance reflects ASEAN's strategic role as both a manufacturing hub and a gateway for re-exports.

However, 2024 marks a notable shift, with **ASEAN's** share in project counts declining to its lowest level in recent years and offset by a rise in projects across other regions, indicating an ongoing diversification in the geographic distribution of Chinese overseas green manufacturing investments.

The most notable emerging hotspot is the **MENA region**, where the number of projects surged from almost none in 2021 to over 20% of total investments in 2024, amounting to nearly USD 50 billion. This sharp increase signals a shift in China's investment

geography, likely driven by MENA's expanding green industrial policies and strategic positioning. Meanwhile, Europe, the United States, and Latin America have sustained a modest yet steady level of project activity throughout the period.

Meanwhile, 2024 saw the entry of new countries and regions into the landscape. For the first time, projects were recorded in **Central Asia and the Caucasus**, signaling a notable geographic expansion into previously unrepresented areas, underscoring the increasingly global reach of Chinese green manufacturing investment and its deepening penetration into new markets.

Over 75 percent of the projects in the database are located in the Global South or emerging markets, demonstrating both the enduring geographical focus shaped by China's BRI strategies and the broader significance of this growing trend. The surge in green manufacturing investment represents a substantial opportunity for Global South countries to host green FDI and enhance their participation in the global green technology market.

A small number of projects were cancelled after the signing of a memorandum of understanding (MoU), formal agreement, or initial public announcement, and have thus been removed from the database. Some cancellations resulted from regulatory and permitting challenges—for example, BYD's planned LFP cathode plant in Chile. In other cases, geopolitical tensions played a decisive role, as seen in the suspension of BYD's proposed plant in Mexico. Shifts in market demand have also contributed to delays or cancellations, such as CNGR's cathode material facility partnered with POSCO in South Korea. Despite these exceptions, the vast majority of projects have progressed into the construction or operational stages. The overall implementation record thus far provides strong evidence of the high likelihood that most projects currently in the planning phase will ultimately be executed.

This geographic distribution suggests that investment motivations can be categorized into three types: Seeking access to host countries markets, access to third-country markets, or access to raw material inputs. Some countries combine several motivations at once.



RECENT TRENDS IN 2025: A SLIGHT SLOWDOWN?

Early-2025 data point to a cooling trend in China's overseas build-out. 68 projects were announced in the first half of the year, and even with a second-half uptick, the 2025 total is unlikely to match the record pace set in 2024—though it should still sit well above the pre-2023 baseline and make 2025 the year with the third-highest investments. The investment tallies shown above will almost certainly rise as more late-stage deals publish capex figures, but the overall trend signals consolidation rather than fresh acceleration.

Trends also vary significantly across host countries, especially among earlier hotspots. Indonesia, Malaysia, Brazil, and Hungary continue to attract a steady stream of new projects, while others—such as Vietnam and Thailand—have seen few recent announcements. These discrepancies likely reflect a combination of factors, including tariff concerns, geopolitical tensions, and differences in industrial focus.

Geopolitical turbulence is reshaping investment flows. The election of Donald Trump has curbed Chinese appetite not only for U.S. projects but also for traditional re-export platforms, where investors now worry about secondary sanctions and tighter rules of origin. At the same time, a growing share of firms is shifting to light-asset strategies—technology licensing, contract manufacturing, and OEM partnerships—pioneered by EV makers and now embraced by battery leaders (CATL, EVE) and solar majors (JA Solar). These models safeguard market access while limiting fixed-asset exposure, helping explain why the 2025 project tally is likely to level off even as commercial engagement continues.

HOTSPOTS BY HOST COUNTRY

In addition to the overall trends outlined above, several individual hotspots stand out—either as host countries attracting particularly large volumes of investment, or as Chinese companies that are especially active in executing overseas manufacturing projects.

Figure 5. Top fifteen Host countries that have received Chinese overseas green manufacturing investment by project count and investment

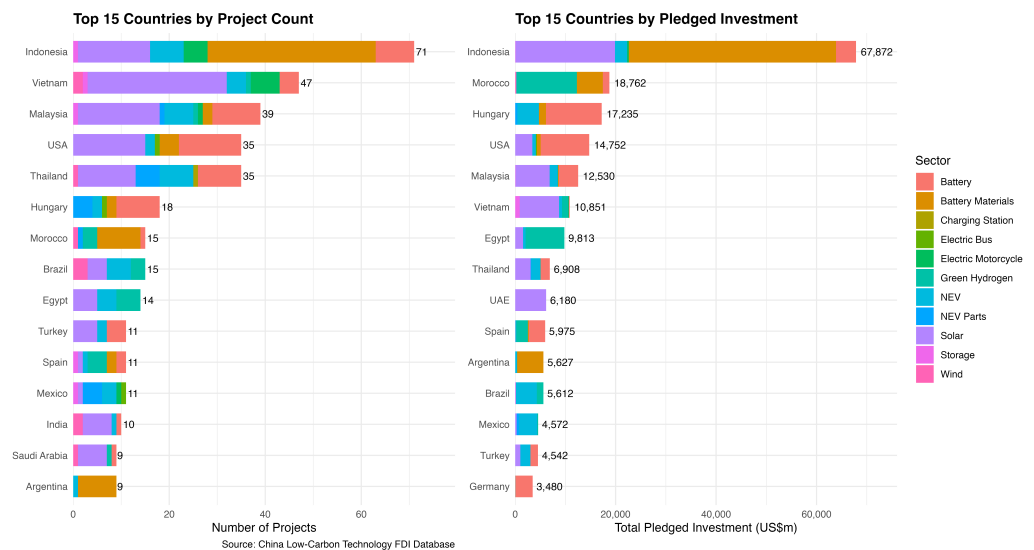


Figure 5 ranks the 15 leading host countries by project count and by total committed capital. **Indonesia** tops both lists by a wide margin, underscoring its role as the linchpin of China's offshore battery-materials strategy. A dense cluster of nickel and other precursor investments—and, more recently, a wave of solar-manufacturing projects—has made Indonesia the pivotal hub in China's expanding green-industry value chain. More broadly, **ASEAN** countries have emerged as the main hubs for Chinese overseas green technology manufacturing.

While many of these countries—such as **Vietnam, Malaysia, and Thailand**—host a high number of projects, the overall investment figures are comparatively lower due to the dominance of solar manufacturing, which typically involves lower capital intensity. Nonetheless, their high activity levels reflect their attractiveness as export-oriented production bases and their FDI openness.

Outside of ASEAN, **Morocco** ranks second in total investment. This is primarily due to large-scale investments in battery materials, supported by the country's significant phosphate reserves (Tanchum, 2022), and in green hydrogen, where Morocco is positioning itself as a continental leader. Its proximity to Europe, combined with favorable trade agreements and industrial policies, has made it an increasingly strategic place for Chinese green manufacturers pursuing further access to the EU market.

Hungary follows closely as the third-largest destination by investment volume, reflecting its role as a key battery manufacturing hub in Europe. The country hosts major projects such as the CATL gigafactory, and several other Chinese battery component and material suppliers. BYD's planned EV production facility further strengthens Hungary's position within the broader European battery and electric vehicle supply chain.

In the **United States**, Chinese investment is concentrated in solar-PV and lithium-ion battery plants, attracted by the market's scale and the Inflation Reduction Act's (IRA) production incentives. Despite intensifying trade barriers and political scrutiny, several Chinese firms—often through joint ventures or minority stakes—have moved to establish U.S. manufacturing capacity to secure tariff-free market access. That momentum, however, now faces headwinds: ongoing revisions to IRA tax-credit rules and broader policy uncertainty could delay, scale back, or even shelve a number of announced projects.

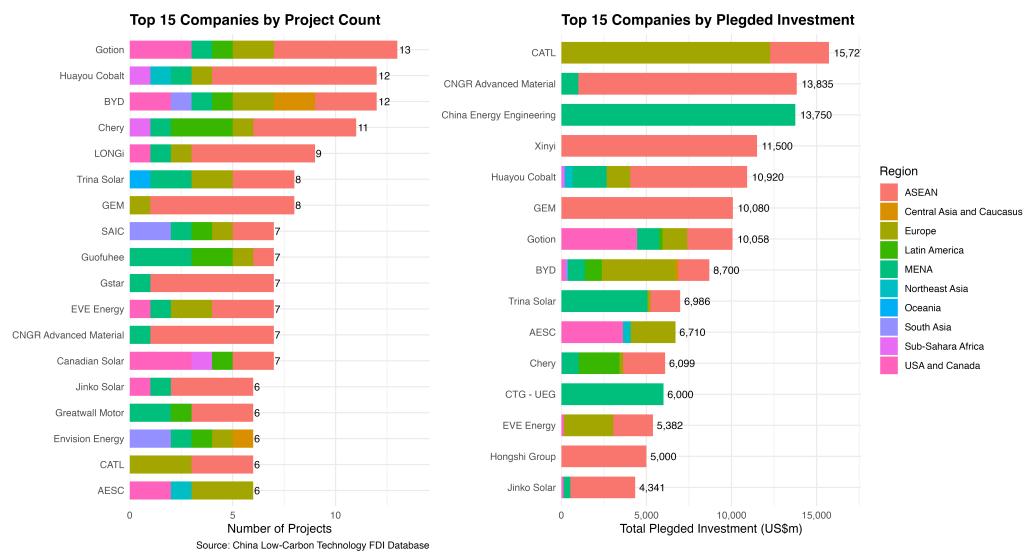
Beyond these front-runners, several other countries have emerged as important nodes in China's green-tech manufacturing network. **Egypt** has become the focal point for Chinese green-hydrogen and green-ammonia complexes, its abundant renewable resources and Suez Canal export gateway creating an ideal launchpad for hydrogen exports. **Brazil** is Latin America's anchor market: its large domestic demand and favourable local-content rules have drawn a broad mix of Chinese solar-PV, battery-materials, NEV, and wind projects. **Mexico** follows, receiving smaller—but still multi-sector—flows of investment across the same technologies. In the Gulf, **Saudi Arabia and UAE** are recasting themselves as a regional energy-transition hub, pairing generous industrial incentives with sovereign offtake guarantees to steer Chinese capital into its clean-energy build-out. In Europe, **Spain** has drawn sizable Chinese investment into battery-cell gigafactories and green-hydrogen complexes, knitting this new capacity into the EU's zero-carbon supply chains.

HOTSPOTS BY CHINESE GREEN MANUFACTURING FIRMS

Figure 6 underscores the differing profiles of China's most active versus its biggest-spending clean-tech investors. By project count, the leaderboard is well-balanced: four battery manufacturers, three battery-materials producers, four solar firms, three NEV assemblers and one green-hydrogen developer. Ranking by capital committed, however, skews toward heavier, more capital-intensive plays: four battery companies, three battery-materials firms, four solar players, two NEV groups, and two green-hydrogen developers dominate the table—evidence that big-ticket hydrogen complexes can disproportionately shape aggregate investment tallies.

Across both metrics the same industry heavyweights—CATL, BYD, LONGi, and their peers—consistently appear, underlining the pivotal role of China's corporate champions in internationalizing the country's green-technology manufacturing footprint.

Figure 6. Top fifteen Chinese green manufacturing firms by project count and total investment



The strategic approaches vary widely. Some companies focus on consolidating presence in one or two key markets, while others pursue broad-based expansion through launching projects in multiple regions. However, most leading companies exhibit a strong regional concentration in terms of investments. For example, **CATL** stands out as the top investor overall, with the majority of its capital directed toward Europe, aligning with the region's advanced EV market and supportive industrial policies. Nickel-focused battery material producers such as **CNGR**, **Huayou Cobalt**, and **GEM** concentrate their operations in Indonesia, leveraging its abundant nickel reserves. Similarly, **China Energy Engineering (CEEC)** and the **CTG-UEG** consortium, both active in green hydrogen, have focused their expansion within the MENA region.

In contrast, some companies are pursuing a more geographically diversified strategy. **Gotion**, for instance, maintains a relatively balanced distribution of projects across several regions. **BYD** and **SAIC** demonstrate wider global reaches, with investments spanning seven out of ten major regions identified in the database.

Notably, companies such as **Volvo** and **AESC**, which were originally international firms later acquired by Chinese companies, have more globally integrated operations and have contributed to the growing number of projects beyond traditional Chinese industrial clusters. Similarly, firms like **Gstar** and **Canadian Solar**, both headquartered overseas, maintain a particularly prominent presence in the global green technology manufacturing landscape.

Among all recorded projects, a notable trend is the rise of megaprojects—large-scale investments with substantial production capacity—launched in recent years. Many firms are also developing long-term roadmaps to establish major manufacturing hubs, signaling a strategic shift from fragmented investment to deep-rooted industrial presence. More than 60 projects currently exceed USD 1 billion in committed investment, spanning a wide range of sectors.

This trend reflects a growing recognition of overseas manufacturing sites as long-term strategic assets with the potential for sustained investment and integration into host-country industrial landscapes. As such, these megaprojects are likely to exert increasingly significant economic, industrial, and environmental impacts on local development.

CONCLUSIONS

The China Low Carbon Technology FDI Database shows that Chinese green technology manufacturers are now central actors in the global clean-tech buildout. Since 2022, the pace of investment has accelerated rapidly—first in solar, then in batteries and NEVs, and more recently in green hydrogen—pushing total disclosed overseas commitments to at least USD 227 billion, with a high-end estimate approaching USD 250 billion, across 461 projects in 53 countries.

While ASEAN remains the most active region, new hotspots have emerged: Indonesia for battery materials, Morocco for cathode and hydrogen facilities, and the Gulf states for solar module and electrolyser manufacturing. Europe and the United States continue to attract high-value projects, especially in batteries and solar, but escalating trade barriers are steering capital toward Latin America, Central Asia, and MENA.

Early-2025 investment numbers signal consolidation. Project counts are likely to plateau below the 2024 record as firms digest a pipeline of megaprojects and hedge against geopolitical risk. Light-asset strategies—technology licensing, contract manufacturing, and OEM deals—are spreading from EV makers to battery and solar firms, allowing Chinese champions to preserve market access without large fixed-asset bets. This shift may temper headline construction numbers, yet the underlying commercial reach of Chinese technology is set to expand.

For host governments receiving Chinese FDI, the data highlight the following actions:

- **Tailor incentives to sector economics.** Capital-intensive battery materials and hydrogen plants respond to tax holidays, concessional land, and long-term finance; solar and NEV assembly lines react more quickly to local-content rules and offtake guarantees.
- **Leverage resource endowments.** Countries with critical minerals, abundant renewables, or large consumer markets can anchor themselves in China-centric supply chains—provided they secure technology transfer, environmental safeguards, and local-value-addition clauses.
- **Plan for scale.** Megaprojects exceeding USD 1 billion are becoming the norm. Ensuring grid, port, and skills infrastructure keeps pace will determine whether these investments catalyse broad-based industrial upgrading or remain enclaves.

For international partners, understanding the geography, timing, and sectoral tilt of China's outward manufacturing drive is essential for calibrating trade policy, supply-chain resilience programmes, and climate-finance initiatives.

METHODOLOGICAL APPENDIX: THE CHINA LOW-CARBON TECHNOLOGY FDI DATABASE

To map and analyze the global footprint of Chinese low-carbon technology manufacturing capacity, we constructed a consolidated database drawing from multiple public and semi-public sources. Existing databases and publications revealed significant gaps in coverage, granularity, and recency—particularly for project-level data from 2023 and 2024.

11 Low-Carbon technologies are tracked in the database: batteries, battery materials, charging infrastructure, electric buses, electric motorcycles, green hydrogen, new energy vehicles (NEVs), NEV parts, solar, storage, and wind.

Data Sources

Our dataset is compiled by drawing on numerous sources. This includes existing datasets and manual searches. In terms of datasets, we draw from six complementary sources. Individually, each of the sources only cover a small proportion of projects listed in our database. After compiling this database, we see that none of the sources list more than one half of the projects covered here. This inadequate coverage in itself demonstrates the need for the comprehensive coverage provided here.

1: China Global Investment Tracker (AEI) – This dataset offers a broad overview of Chinese outbound investment and construction activities. However, its coverage of green technology manufacturing is limited, particularly for recent years. As such, the dataset is used primarily as a macro-level reference and requires supplementary verification.

2: Climate Energy Finance (CEF) — An Australia-based think tank whose 2024 report includes a project-level database of Chinese outbound cleantech investment announcements from 2023 onward. This serves as a near-term update on recent activity.

3: BHI Database — Maintained by Huaxinjie Investment Consulting and co-established with NDRC-affiliated institutions, this long-running Chinese database covers proposed and under-construction investment projects, including substantial entries on overseas green manufacturing, especially EPC and industrial park developments.

4: Belt and Road Portal — A government-backed platform with a weekly investment news column. To systematize its unstructured updates, we developed a custom scraper to extract and compile project-level information from each bulletin.

5: EVA Global — A Chinese market intelligence agency specializing in electric vehicles (EVs) and supply chains. Its dataset tracks Chinese manufacturers' overseas footprints across EVs, EV parts, and battery sectors, filling critical gaps in the upstream clean tech value chain.



6: Development Reimagined — Their Tracking China-Africa Climate Actions platform offers project-level insights into China's climate finance in Africa since 2021, with a focus on manufacturing, infrastructure, and clean energy deployment under the FOCAC framework.

All projects identified from these sources were subjected to a manual verification process. Each entry was cross-checked against both Chinese- and English-language media, corporate disclosures, and third-party reports. Projects lacking credible confirmation or containing erroneous information were excluded. The resulting database offers improved granularity, cross-sectoral breadth, and up-to-date coverage, allowing for a more accurate analysis of China's global green manufacturing expansion. The fDi Intelligence database was also consulted though we found few relevant projects listed there.

In addition, to address the known limitations of existing databases and reduce the likelihood of omitting relevant projects, we conducted a systematic manual search using targeted keyword combinations across Chinese and international platforms, including Baidu, WeChat, and Google. Keywords were constructed in both Chinese and English following the format: (Technological Sector / Company Name) + (Geographical Region [Region/Country]) + (Factory / Manufacturing Plant) + (Year [optional]). When a project appeared in third-party media or investor reports but lacked direct confirmation from the company, we conducted follow-up searches using the specific project name and only included the project if it is present in official sources (e.g., corporate announcements, government records, regulatory filings, or stakeholder interviews). For projects in early-stage development—i.e., those marked as “planned” or “under consideration”—inclusion was permitted if corroborated by credible media sources, concerning the often limited public disclosures by Chinese firms. While manual collection introduces certain inherent limitations, the use of structured search protocols and multi-source triangulation ensures that the resulting dataset is among the most complete and rigorously vetted compilations currently available on Chinese green technology manufacturing investments overseas.

Data management

We code “project status” based on publicly available company disclosures: Under Consideration: means a company has expressed interest but no firm plan or commitment exists; Planned: refers to projects where the company has announced a concrete plan to build the manufacturing facility; Agreement Signed: indicates that a binding agreement or contract has been concluded, though construction has not yet begun.

Statuses are updated when official or credible new information becomes available. If a project is confirmed to be canceled—either after its completion or before reaching operation—based on credible information sources, it is removed from the database. However, in the absence of official or credible updates on a project's status, it is retained with specific qualifiers. For projects that appear to have been completed but lack confirmation of operation, the status is marked as 'Unknown.' If a project has passed its originally scheduled start of production without any reports of commencement, the 'Actual/Expected Start of Production' column includes the label 'Incomplete yet,' highlighted in dark orange. These projects are not removed unless there is official confirmation of cancellation or indefinite postponement.

Projects in the database are allocated to ten geographic aggregates—ASEAN, Central Asia & the Caucasus, Europe, Latin America, the Middle East & North Africa (MENA),



Northeast Asia, Oceania, South Asia, Sub-Saharan Africa and US and Canada—allowing region-specific analysis through ten companion sub-datasets.

Each entry in the database is categorized using a detailed technology taxonomy comprising eleven Tier-1 sectors: batteries, battery materials, charging infrastructure, electric buses, electric motorcycles, green hydrogen, new energy vehicles (NEVs), NEV parts, solar, storage, and wind. For five of these—batteries, green hydrogen, solar, storage, and wind—the classification encompasses manufacturing activities across the entire value chain, including parts and component production. More specific activities within each sector are captured through a Tier-2 sub-sector classification, enabling greater analytical granularity.

The variable “Year” captures the calendar year in which a project was first publicly announced, or, where announcements are absent, the earliest verifiable online reference. Where available, the dataset also records announced or estimated investment value, production capacity and (actual or expected) start-of-production dates. Project status reflects the most recent credible update, and a free-text Notes field preserves contextual details that fall outside the core schema.

Four principles guided the inclusion criteria for identifying Chinese overseas low-carbon technology manufacturing investments. First, the definition of “Chinese firm” encompasses three categories: (1) companies headquartered in mainland China; (2) firms headquartered abroad but predominantly controlled by Chinese entities—these are indicated in light green in the database; and (3) foreign subsidiaries wholly or majority-owned by Chinese parent companies through mergers and acquisitions—indicated in orange. For the third category, only new overseas manufacturing facilities announced after the acquisition are included, ensuring that only post-acquisition investment behavior is captured. This classification allows the database to reflect a broader spectrum of outward investment activities, including those by firms with international headquarters but Chinese ownership or control—entities that are increasingly recognized in policymaking and industry analysis as part of China’s global green industrial footprint. Representative examples include Gstar (Singapore HQ), Canadian Solar (Canada HQ), AESC (a subsidiary of Envision), Maxeon (a subsidiary of TCL Zhonghuan), and Volvo (a subsidiary of Geely).

Second, the low-carbon technology manufacturing investments included in this database refer to any investments primarily aimed at producing final products that contribute positively to the green transition, as well as their intermediate components and source materials. By this standard, manufacturing facilities for new energy transportation vehicles and their parts, renewable energy solutions, batteries, and battery materials (e.g., nickel smelters for battery production) all fall within the green technology manufacturing investment category.

Third, the dataset includes merger and acquisition (M&A) projects only when the transaction results in incremental manufacturing capacity attributable to the Chinese investor. This applies to cases where, following the acquisition, the Chinese firm either establishes a new greenfield manufacturing facility or directly acquires and retains an operational plant as part of the transaction. In contrast, transactions in which the Chinese investor merely assumes ownership of a firm with pre-existing manufacturing assets—without subsequent expansion—are excluded. Similarly, technology licensing arrangements that do not involve the creation of new manufacturing capacity under Chinese ownership or control are also excluded.

A few sector-specific nuances should also be noted. Given the prevalence of mixed production lines in the automotive sector, a factory is included in this analysis only if it currently manufactures hybrid or electric vehicles (NEVs) and demonstrates a commitment to expanding NEV production over time. This includes (i) new facilities with declared plans to produce NEV models upon completion and a long-term goal of increasing NEV output, and (ii) existing gasoline vehicle plants that have been upgraded to incorporate NEV manufacturing, in which case the recorded project start date corresponds to the year of the upgrade.

For upstream component and material factories, only those primarily engaged in producing inputs specifically intended for green technology applications are included. Projects are eligible only if they involve manufacturing processes, and the end product is an intermediate or finished good—not a raw material. Accordingly, mining operations are excluded unless they are directly integrated with manufacturing activities. For cobalt-related projects, where facilities often co-produce copper, inclusion requires either that the factory produces only cobalt intermediates or that the cobalt production segment can be clearly delineated from copper operations.

Investment estimations

Given the diversity of data sources, inconsistencies may arise in the details of each investment project, particularly regarding investment amounts. To address this, we follow a hierarchical approach in determining the recorded data. The highest level of credibility is assigned to official sources—such as a company's official website, WeChat account, or formal investment disclosures—followed by information from think tanks, market intelligence agencies, or trade associations (primarily Chinese) with a specific focus on the relevant region or sector. Next in credibility are reports from reputable media outlets with a consistent track record of covering Chinese overseas FDI in a given region or sector. Lastly, data from the BHI database is considered, as it relies on its own reporting mechanisms rather than external verification.

If no reliable source reports the investment amount, an estimate is made where possible—indicated in a lighter font color—based on benchmarking against projects with comparable capacity, located in similar regions, and initiated within a similar timeframe. The estimation process draws on as many relevant reference projects as possible to enhance accuracy. However, if no capacity data is available or if there are too few comparable projects within the same sector or region, the investment amount is left blank

Finally, it is important to acknowledge the limitations of the database construction process. Despite extensive review of all accessible sources, the reliance on manual searches introduces inherent constraints in achieving fully comprehensive and systematic coverage—particularly for smaller-scale investments by less publicly visible firms. While cross-verification across multiple sources ensures that each recorded project exists on paper, the dataset cannot systematically exclude projects that, despite having been announced, were subsequently shelved or canceled due to internal decisions that have not been publicly disclosed. Given the limited transparency surrounding project implementation updates, especially among certain firms, undetected project cancellations or stalled developments remain a residual source of uncertainty.