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Sebastian Contin Trillo-Figueroa

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Sebastian Contin Trillo-Figueroa

Geopolitics Analyst in EU-Asia Relations and AsiaGlobal Fellow, The University of Hong Kong

Europe seeks its share of the sun, but like Icarus, it misjudges the distance, only to be eclipsed by China's dominion over the solar market.

In the latest chapter of the EU's "geopolitics over climate" saga, the spotlight is on China's solar industry—a sector in which Europe's environmental goals and strategic ambitions collide. The EU's reliance on Chinese clean tech reveals an uncomfortable truth: Europe is seeking energy independence while fastening itself to a competitor whose control over the solar market leaves it immobile.

That said, the EU has made remarkable strides in reducing greenhouse gas emissions. 2023 saw an 8% decrease in emissions across key sectors like transport, agriculture, and small industry. Renewable energy now leads electricity generation, hitting 44.7% last year—outpacing fossil fuels at 32.5% and nuclear at 22.8%. This shift has lowered EU-wide emissions to 37% below 1990 levels, all while the region's GDP grew by 68%.

Why reconsider what is working? Europe's anxiety stems from its heavy reliance on a supply chain dominated by China. China controls over 80% of global solar PV manufacturing, while the EU accounts for less than 3%. This dependence stems from two key factors: first, decades of strategic Chinese investment in solar technology and related sectors, which has allowed it to control essential components and critical raw materials; second, intense internal competition within China's solar industry.

A decade ago, the EU's attempt to tackle China's solar exports revealed just how flimsy its strategy was. Cost-effective Chinese panels flooded Europe, leading to bankruptcies and layoffs. The EU's 2013 tariffs set as high as 48%? Barely a dent, thanks to Germany's push to ease them—just like today with EV duties. China's dominance only grew, while Europe missed a chance to build its own solar industry. Currently, producing PV panels in Europe costs up to 45% more than in China, being the U.S. an uncompetitive alternative. Europe now faces a tougher version of an old question: how to compete on price when China already dominates the market?

Beyond production dominance, China's competitive edge in solar power is shaped by aggressive domestic market strategies. During a meeting at Jinko Solar in Shanghai in late October 2024, the AsiaGlobal Fellows at the University of Hong Kong were given an insider's view of the company's impressive achievements and market influence. In discussions with Jinko's leadership, Dany Qian and Gener Miao noted their production of one out of every eight solar panels globally, capturing approximately 14% of the market share.



Image taken by the author: How Jinko envisions the future of urban living

How did they achieve such dominance? Qian and Miao explained that China's solar industry thrives on intense competition, which has driven rapid innovation and relentless efficiency—and that's precisely the secret to their success. This fierce rivalry drives both technological advancements and remarkable gains in production capacity. Impressively, they highlighted that for every 0.4 kWh of solar panel consumed "dirty" across the production chain—from mining to final product operation—they generate a clean green 45 kWh over 30 years, achieving a remarkable 100 output; this also translates into significant energy cost savings.

In response to what is considered a great concern, Europe has applied three measures. First, it seeks to de-risk its supply chain, framing this as a response to alleged Chinese "[distortive subsidies](#)" that may contravene the economic security package, more specifically the EU Foreign Subsidies Regulation. However, the underlying divergence between Europe and China extends beyond subsidies, as referred. Nevertheless, in April 2024, the Commission accused China of flooding the market with "[massive subsidies](#)" on solar products, driving competitors out by exporting "overcapacity" at low prices. Simultaneously, Brussels recently [imposed](#) countervailing duties to Chinese electric vehicles, and initiated another probe into Chinese wind turbine installations.

Second, the EU is using human rights concerns linked to solar panel production in Xinjiang, one of the largest production regions, as a [rationale](#) for restricting imports; what it hoped to achieve since its approval last March remains a mystery today. Third, discussions on stricter import quotas for Chinese solar products have been ongoing—but as of now, they seem to be frozen in place.

Which of these solutions provides a viable alternative for the EU? None seem to address the core issues. While limiting Chinese imports could jeopardize climate goals, it also fails to solve Europe's dependence on China. Brussels must decide whether its focus is truly on climate action or geopolitical positioning—even if that goal remains elusive. At present, it seems trapped in a web of conflicting priorities that undermines a unified approach at the intersection of energy independence, climate action and geopolitical clout.

This ambiguity is echoed by bureaucratic politics, where policy strategies diverge from industry needs. In February, the European photovoltaic manufacturing lobby urged for “[emergency measures](#)” to protect the EU supply chain against China’s “significant oversupply.” Their proposals included purchasing stockpiled European panels, increasing EU project funding, and restricting Chinese imports to stabilize the market. None of those were acted upon.

Meanwhile, the EU aims to make solar power its primary electricity source, with the Solar Energy Strategy targeting 600 GW of capacity by 2030, while the [EU Net-Zero Industry Act](#) seeks to produce 40% of clean energy domestically. Enrico Letta’s report emphasized that “reducing electricity costs for households and industry is the first priority,” necessitating faster deployment of affordable renewables. Mario Draghi’s report warns that “EU demand for clean tech may not be met by local supply due to growing Chinese capacity and scale [...] Europe must confront fundamental choices about how to pursue its decarbonization path.” Paradoxically, if the EU struggles to onshore and produce solar tech economically, it may ultimately absorb China’s surplus capacity.

Given the numerous challenges, Qian and Miao further emphasize the complexities of the solar sector, particularly regarding trade and the increasing scrutiny of dependence on Chinese products. They noted the volatility of the global solar market, which is driven by shifts in policies, subsidies, and frequent supply-chain disruptions. This inherent unpredictability is compounded by geopolitical tensions, adding further uncertainty to an already fluctuating market.

In this regard, concerns are mounting internationally over China’s “New Three” industries policy, which now designates solar technology as a high-priority sector for national development. By doing so, Beijing signals a clear intent to further dominate the industry, framing solar power as crucial to both economic leverage and national security. This places European industries in direct competition with a global powerhouse determined to lead in renewables.

The EU’s pursuit of energy independence faces, therefore, a hard truth: its green transition remains heavily reliant on China. This dependency obfuscates genuine progress toward autonomy. When this ambition collides with the goal of achieving geopolitical leverage, the equation becomes even more challenging—perhaps even unworkable.

The irony is rich: to gain autonomy, Europe may have to double down on subsidies to boost domestic production and truly compete with China. Alternatively, Europe could negotiate with China to reduce its dependency by delineating areas of the supply chain where each party could specialize, allowing for more balanced collaboration in solar product manufacturing.

Meanwhile, with Beijing designating solar as a pillar of national strategy, Europe remains tethered to China’s supply chain, rendering true independence today almost a fantasy. Reshaping policy with this reality in mind isn’t just strategic; it’s essential for any coherent path forward.