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Solar BRICS: Emerging economies now lead the world's clean energy race

Led by China’s rapid build-out, some BRICS members have become leaders in the global solar-led transition, making up three of the top five solar generation countries and achieving cleaner growth in the power sector.

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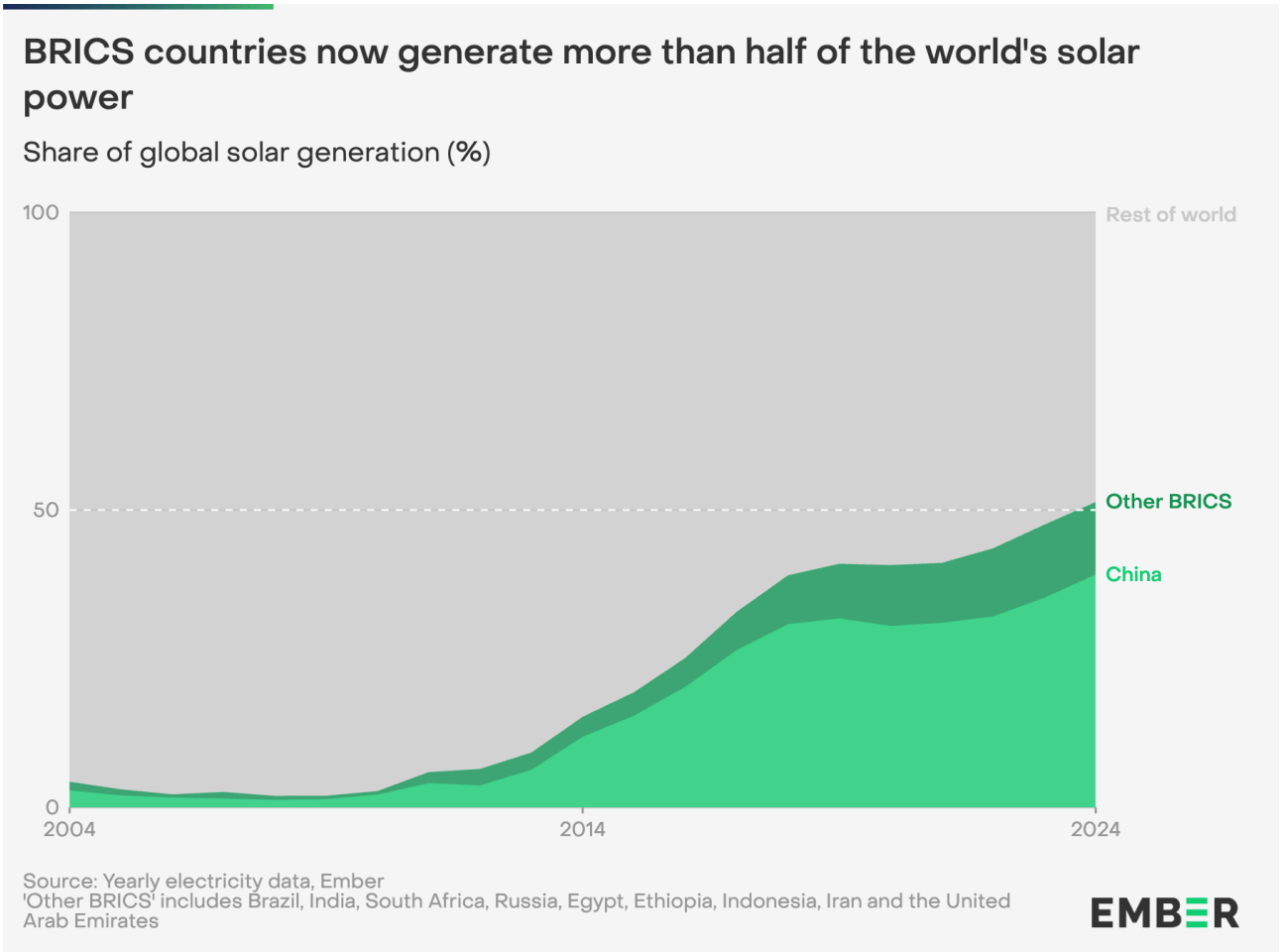
BRICS countries now generate more than half of the world's solar power

In 2024, the ten BRICS members — Brazil, China, India, South Africa, Russia, Egypt, Ethiopia, Indonesia, Iran and the United Arab Emirates — collectively accounted for 51% of the world's electricity generation from solar, a dramatic rise from just 15% a decade ago.



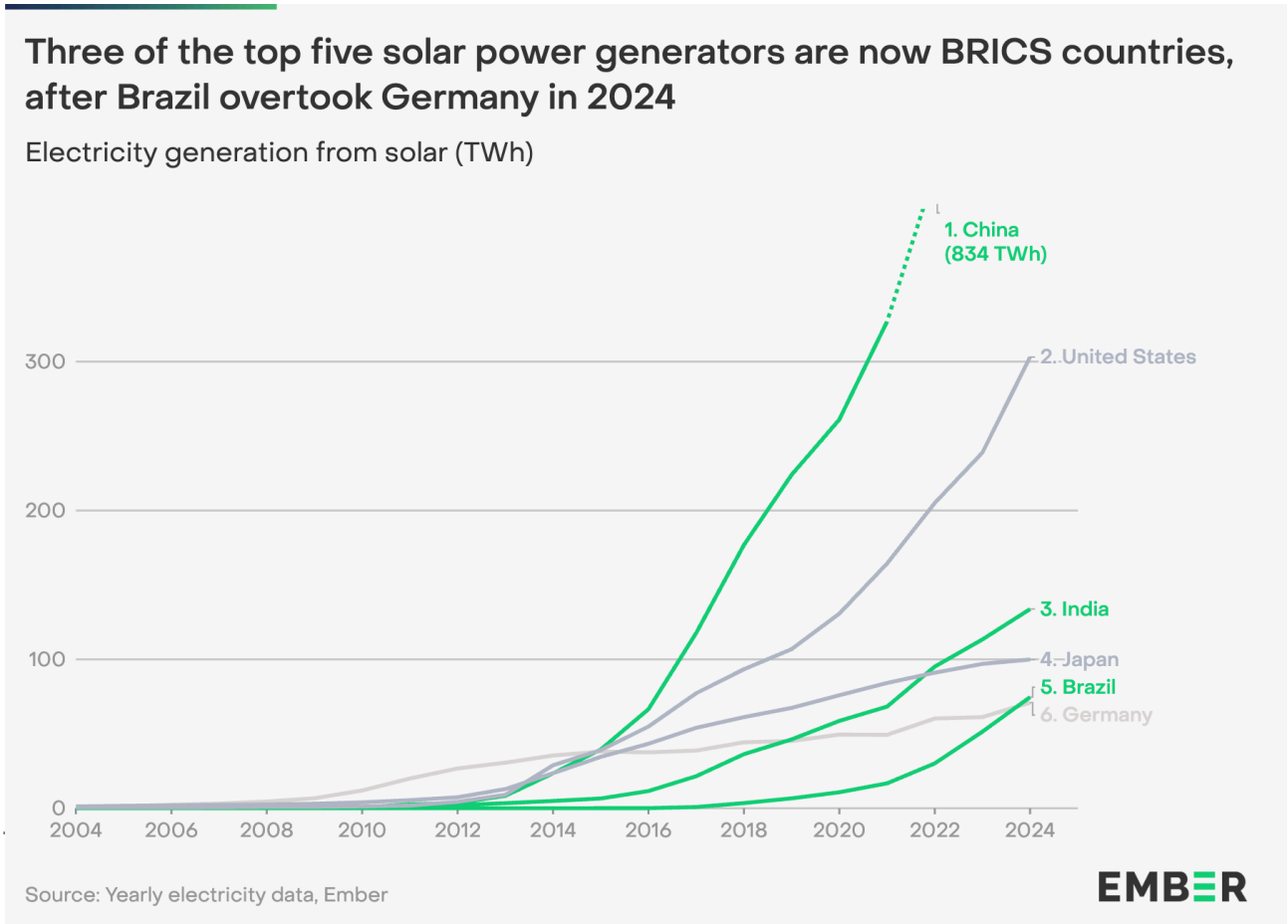
China was the dominant driver of this increase, making up 39% of global solar generation in 2024, up from 12% in 2014. India and Brazil were also major

contributors, with India accounting for 6.3% (up from 2.5% in 2014), and Brazil for 3.5% (0.01% in 2014). South Africa and the United Arab Emirates each made up 0.9%, with the remaining BRICS countries together contributing 0.5% of the global total.

Three of the top five solar countries are now BRICS members

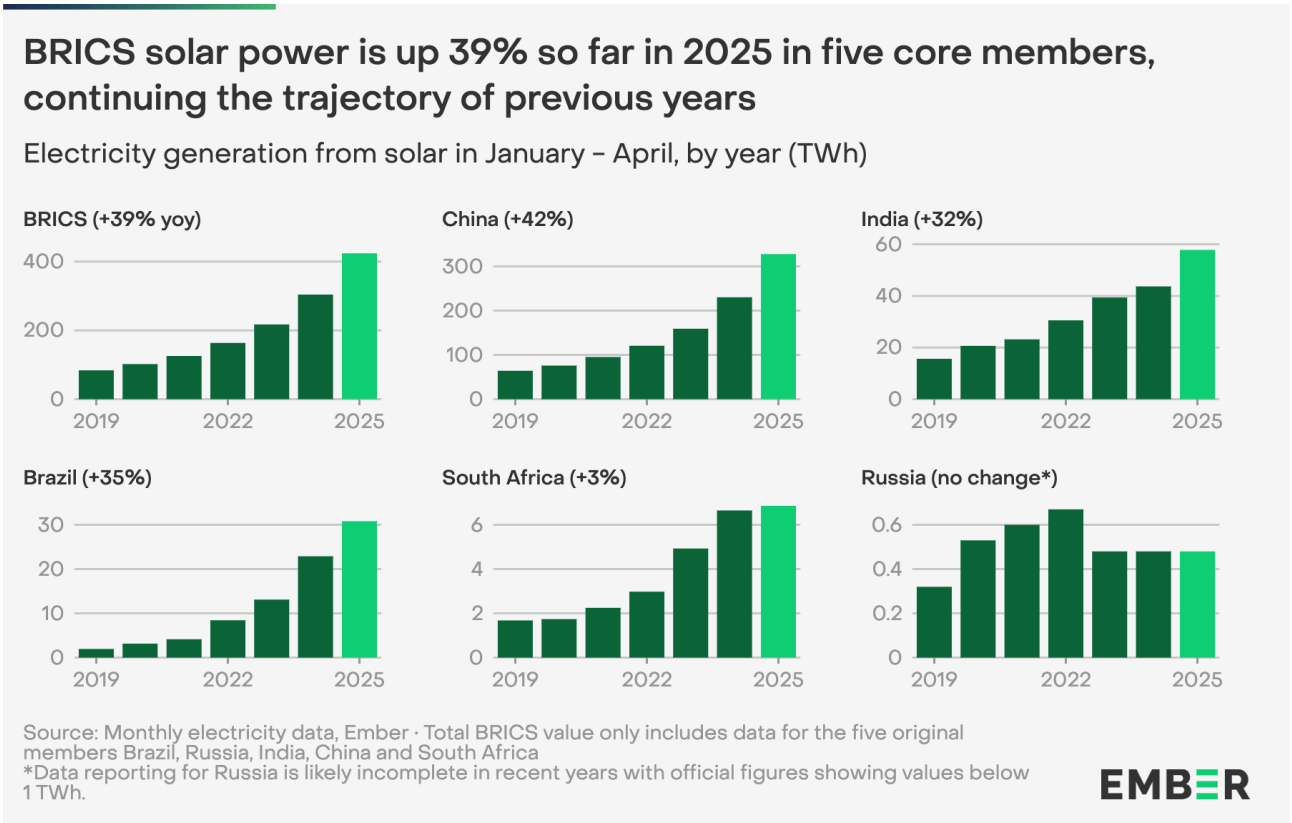
In 2024, China generated 834 TWh of electricity from solar — more than any other country and nearly three times as much as the United States, which ranked second with 303 TWh. India, the third largest solar power generator globally, quadrupled its generation in just 5 years, reaching 133 TWh in 2024. This is more than the entire annual electricity demand of the Philippines. Brazil also made a significant leap, entering the global top five with 75 TWh of solar generation in 2024, overtaking Germany's 71 TWh. Just five years ago, in 2019, Brazil had been ranked 14th in the world.

Meanwhile, South Africa and the United Arab Emirates secured spots in the global top 20, ranking 16th and 18th respectively.



Solar power generation is seeing continued strong growth in 2025 in three of the five original BRICS members

Solar power generation across the five original BRICS members rose by 39% between January and April 2025, compared to the same period in 2024 — led by China, India and Brazil. The three countries maintained the strong growth rate set in previous years.



Among the core BRICS members, China led in both absolute and percentage terms, adding 98 TWh in the January to April period, a 42% rise year-on-year. This increase in China's solar power in just the first four months of 2025 was equivalent to Italy's total electricity demand during the same period. It also contributed to a new milestone, with China's solar and wind generation exceeding 25% of total electricity for a single month for the first time in April, as reported by Ember previously.

Brazil and India also recorded significant growth. Solar generation in the January to April period was 35% higher (+7.9 TWh) in Brazil and 32% higher (+14.1 TWh) in India compared to the same period in 2024. South Africa's solar generation grew by a modest 3%, a substantial slowdown after the strong increases seen during the same period in 2023 and 2024.

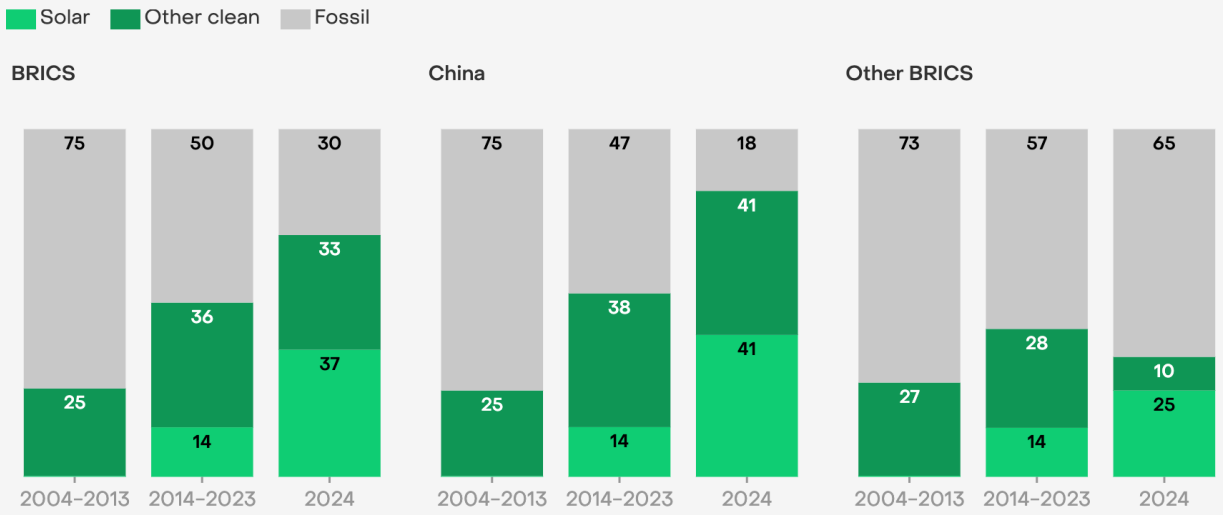
Russia continues to lag behind in solar deployment, with minimal progress. Reported solar generation remained below 0.5 TWh in the first four months of 2025, another sign that Russia is quickly falling behind its BRICS peers in integrating more clean power into its electricity mix.

Solar power met over a third of the increase in electricity generation in BRICS countries in 2024, with all clean sources totalling 70%

Spearheaded by the rapid build-out of solar power in China, India and Brazil, solar met 37% of the increase in electricity generation across all BRICS members in 2024. This marks a major leap from previous decades — solar contributed 14% of generation growth between 2014-2023, and a mere 0.25% in the ten years before that.

Solar accounted for more than a third of BRICS countries' electricity generation increase in 2024

Share of generation increase met by clean and fossil sources for each time period (%)



Source: Yearly electricity data, Ember
Other clean sources include wind, hydro, nuclear, bioenergy and other renewables such as geothermal, tidal and wave energy; BRICS countries include Brazil, China, India, China, South Africa, Russia, Egypt, Ethiopia, Indonesia, Iran and the United Arab Emirates

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Other clean sources met an additional 33% of the increase in electricity generation in 2024, bringing the total share of clean sources to 70%. This represents a significant shift compared to the 2014-2023 period, when clean sources met 50% of the increase in electricity generation, with the rest coming from fossil fuels. In the decade before that, clean sources met just 25% of the increase in generation.

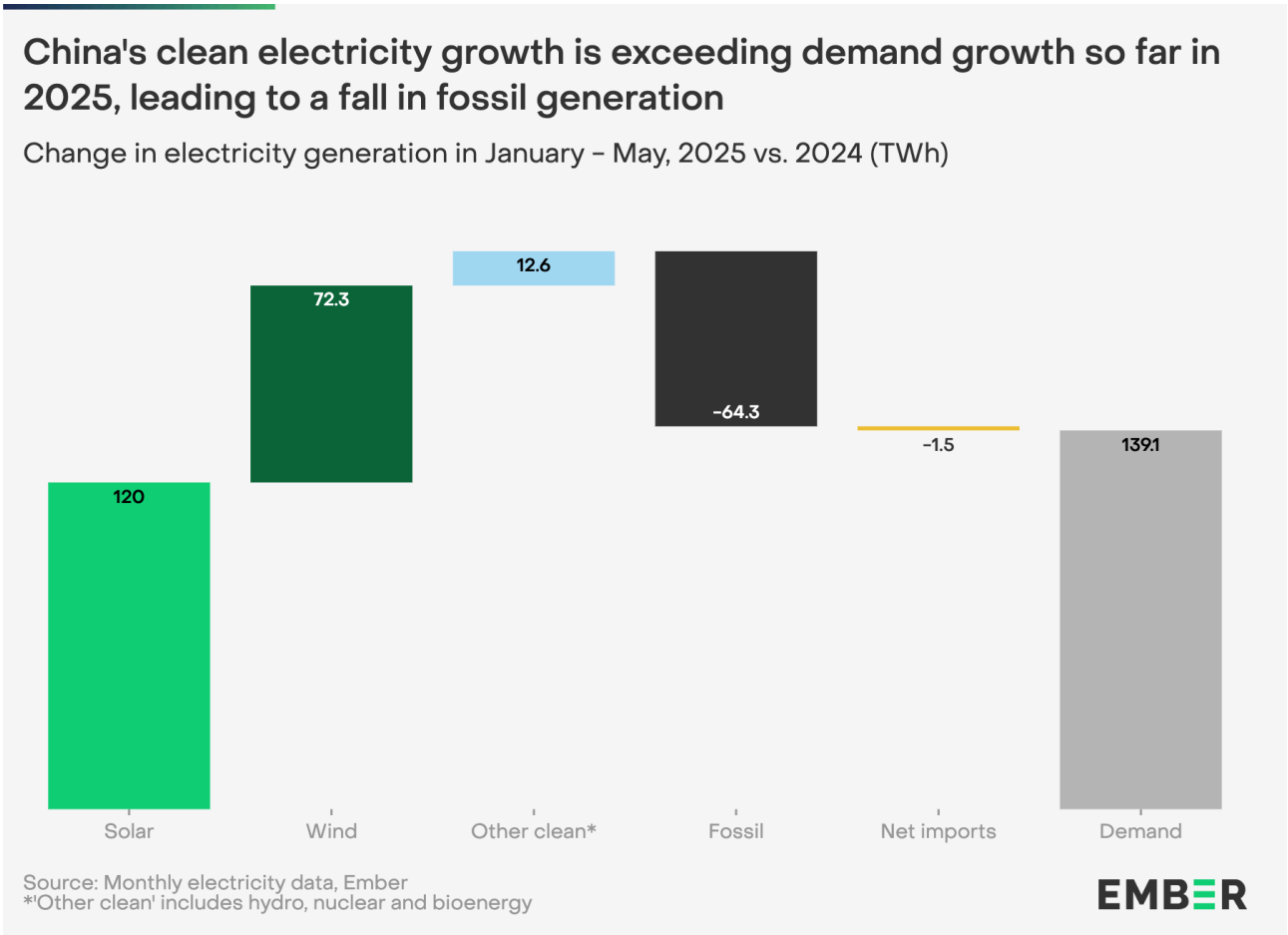
The 50% clean share during the 2014-2023 period might come as a surprise, given how narratives around BRICS energy systems often highlight growing coal and gas use. However, consistent capacity additions in both solar and wind power, along with moderate additions in hydro and nuclear, have shifted this paradigm.

China stands out as a leading example. In 2024, solar alone accounted for 41% of the increase in electricity generation, and all clean sources combined made up 82%, as reported in Ember's Global Electricity Review 2025. That 41% solar contribution was more than three times higher than its share in the previous decade (2014-2023), when it met 14% of the increase in generation.

Other BRICS countries are also making noticeable progress. In 2024, solar met a quarter of their electricity generation growth, a substantial increase from 14% across the previous decade.

Solar's rise is bringing fossil fuels to a tipping point in China

Recent Ember data shows that so far in 2025, China is meeting and exceeding its growth in demand with clean sources. Solar generation increased 120 TWh in the first five months of 2025 and met 86% of the increase in demand of 139 TWh. This, together with substantial growth in wind and other clean sources, led to a fall in fossil generation of 64 TWh, a 2.6% decrease from January to May 2024.



Solar brings clean power opportunity for all BRICS members

While the overall trend across BRICS points to a growing focus on clean electricity, individual member countries still differ greatly in their trajectories. For instance, in Indonesia, more than three-quarters (76%) of the increase in electricity generation between 2014 and 2023 was met by fossil sources. In Egypt, gas remains the dominant source for meeting new electricity demand, despite the country's excellent solar potential.

However, the economics of clean energy are shifting rapidly. A recent Ember report showed that all-day, year round solar power is now feasible and cost-competitive in countries such as South Africa by pairing solar installations

with batteries. The fall in solar and battery module prices will only further strengthen the case for solar power in BRICS nations.

China, Brazil, India are already showing that economic development and clean electricity growth can go hand in hand. In these countries, solar power has emerged as the driver of the electricity transition. The United Arab Emirates has recently started deploying solar power at scale to meet its growing energy needs. Beyond BRICS, countries such as Pakistan have shown that rapid deployment of solar power can transform power systems in a matter of months or years rather than decades.

With excellent solar potential across all BRICS members, it is now time to realise this opportunity.