

A satellite image of a coastline, showing a blue ocean on the left and a brownish-orange landmass on the right. The landmass has a complex, irregular shape with many inlets and peninsulas. The image is taken from a high angle, looking down at the Earth's surface.

CLIMATESCOPE 2024

Emerging Markets Power Factbook

NOVEMBER 2024

BloombergNEF

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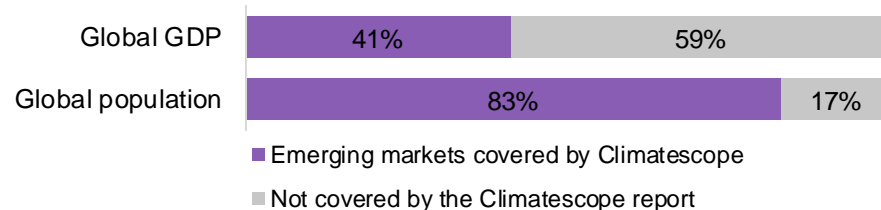


01. **About Climatescope**

BloombergNEF

Mapping out market attractiveness across the energy transition

Climatescope report coverage



Source: BloombergNEF. Note: For further details on how Climatescope has evolved over the years, please visit global-climatescope.org/about. For the full list of markets covered, please see the Methodology section at the end of this report. GDP refers to gross domestic product. Mapped data are for distinct economies.

Climatescope is BloombergNEF's annual online market assessment tool, report and index that evaluates individual markets' relative readiness to put energy transition investment to work. This is the **13th annual edition** of the report. Since its inception, Climatescope's coverage has evolved and expanded, and it now includes detailed information on **140 markets** around the world – or nearly every market with more than 2 million inhabitants.

This year, the focus of the report has shifted. While data is still collected for developed economies, emerging markets are now in the Climatescope spotlight. How the energy transition is progressing in these markets – and how they are harnessing the transition to boost attractiveness to outside investors – has taken center stage.

Together, the 110 emerging markets included in Climatescope cover **83% of the global population** and **41% of the world's gross domestic product**. That's a huge opportunity for the energy transition.

The effort to highlight opportunities and barriers in emerging markets has also informed Climatescope's approach to mainland China. While it is classified as an emerging market, the Asian giant is on a different energy transition trajectory from most other emerging economies; for this reason, it is excluded from some analysis in the report.

Climatescope: Tracking energy transition investment opportunities in emerging markets

Climatescope outputs



Source: BloombergNEF

This report brings together and analyzes data collected by more than 30 BNEF analysts in the first half of 2024. A deep dive into how emerging markets are responding to and driving the energy transition, it offers snapshots of current clean energy policy and finance conditions that can lead to future capital deployment and project development.

Both the Climatescope ranking methodology and this report are built on three key parameters:

- **Fundamentals** are the policies and market structures that impact investment or deployment in a given market.
- **Opportunities** examine a market's potential to grow its supply of renewable power.
- **Experience** summarizes a market's achievements to date, and considers how that experience can drive future build.

Climatescope data is updated annually for all markets at the end of the year. Data collection is done through official sources including utilities, energy agencies, ministries and other governmental entities.

Readers are encouraged to explore the complete ranking, datasets, methodology, tools and market profiles on the [Climatescope website](#).



02. **Executive summary**

Executive summary

Emerging markets are making significant strides in the energy transition. More emerging markets than ever are implementing clean energy policies, combined investment has soared past \$100 billion for the first time, and renewables now account for the vast majority of new capacity additions. Yet investments remain heavily concentrated in a few regions, leaving lower-income economies lagging behind their targets and trailing in the race toward a cleaner economy.

The *Emerging Markets Power Factbook*, part of BNEF's Climatescope project, maps out the progress of clean energy deployment and investment across 110 emerging markets around the world.

- The number of emerging markets with clean energy policies on the books reached a new high this year. This was true for all four of the key policy mechanisms – renewable energy targets, auctions/tenders, net metering and feed-in tariffs – surveyed by Climatescope. As of mid-2024, 95% of emerging markets had a clean energy target in place, and auctions and tenders are now available in nearly two-thirds of emerging markets.
- African markets were responsible for a large chunk of these new policies. The continent has added 25 mechanisms to the global total since 2021. Three years ago, 74% of the continent's markets had a clean energy target in place; now, 98% do. Net metering saw a similarly increase over the same period, rising to 46% of surveyed African markets from 26%.

77%

Share of emerging markets' power capacity additions that came from solar and wind in 2023

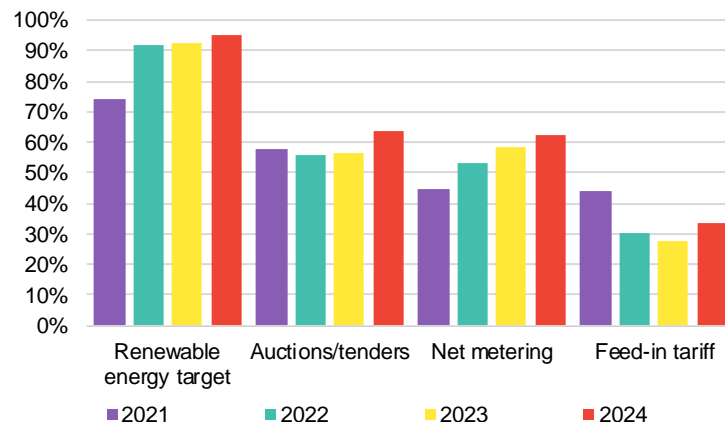
\$116 billion

Emerging markets' new-build renewable energy investment in 2023, a record high

95%

Share of surveyed emerging markets that have renewable energy targets in force

Share of emerging markets with key policy mechanisms in force, 2021-24

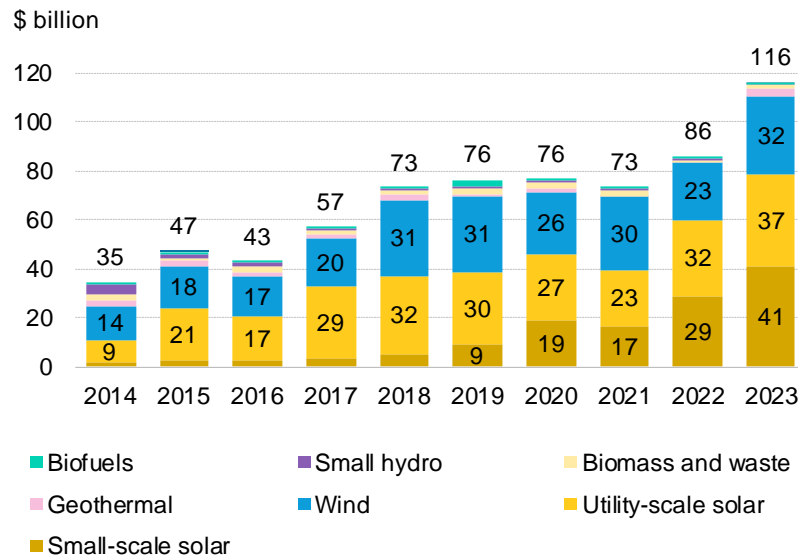


Source: BloombergNEF

Executive summary (2)

- Today, almost all emerging markets have a renewable energy target. However, in most of them, a significant gap remains between the necessary trajectory for meeting that target and the current state of affairs. Among the emerging markets surveyed, just 7% have reached their set targets. More than three-quarters have a medium or large gap to meeting the target, while 9% have a small gap to meeting their goals.
- On the investment front, emerging markets (excluding mainland China) accounted for 17.5% of global investment in renewables in 2023. A 35% year-on-year jump in funding pushed them past the \$100 billion mark for the first time. But progress is uneven. Just 15 emerging markets concentrated 84% of new-build clean energy investment last year.
- Solar was the key driver of this surging investment. Of the \$116 billion invested in emerging markets last year, a record \$78 billion – or more than two-thirds – was for this technology. Small-scale solar accounted for slightly more than half of the total for solar.
- Wind investment was smaller than that for either small- or utility-scale solar, but the \$32 billion invested in this technology in emerging markets was another record sum.

New-build renewable energy investment in emerging markets (excluding mainland China)



Source: BloombergNEF. Note: Data includes new-build asset finance and small-scale solar investment globally. BNEF's renewables data includes a global buffer for small-scale solar due to difficulties in tracking individual projects.

Executive summary (3)

- Thanks to these investments, clean energy deployment also surged in 2023. Together, solar and wind accounted for over three-quarters of capacity additions in emerging markets. Installed solar capacity surpassed 300 gigawatts, and now accounts for 40% of installed capacity in emerging markets. A decade ago, that figure was a mere 11 gigawatts.
- Yet while significant progress has been made, an array of policy and infrastructure barriers have acted – and continue to act – as speedbumps on the road to decarbonizing emerging markets. Old and inadequate grid infrastructure continues to plague these regions, and half of the surveyed emerging markets still lack access to universal electrification. Financial instability, political instability and corruption erode investor confidence, making it difficult to secure funding for large-scale renewable projects.
- On the flip side, many emerging markets are a well of untapped opportunities. In emerging markets, higher income levels often correlate with more extensive power price subsidies. This creates a unique opening to attract new renewable energy projects and investments aimed at reducing dependency on subsidized energy sources.
- Markets in the low and lower-middle income brackets have the fewest power price subsidies, likely because they lack the financial capacity to implement and maintain large-scale subsidies over an extended period. Low-income markets also face the highest electricity prices among emerging markets. This is primarily due to a lack of mechanisms that promote competitiveness, which could help reduce power costs. Additionally, these markets often have highly depreciated currencies, which inflates the cost of imported electricity.
- Each year, Climatescope ranks emerging markets in terms of attractiveness for clean energy investment. For the second year in a row, India has come in first. This year, the Philippines, mainland China, Kenya and Romania round out the top five.
- At the same time, the year-to-year variability in the Climatescope ranking illustrates the speed with which the energy transition is moving and can gain pace. Kenya's top-five finish was a result of jumping up 15 places in the ranking, while Nigeria and Namibia moved up 24 and 48 places, respectively, to enter the top 10.

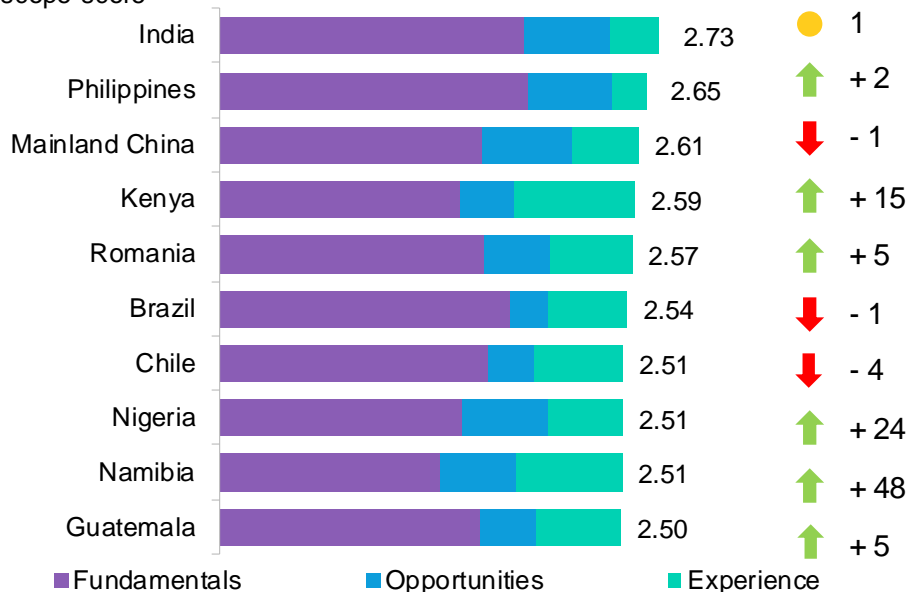


03. Power ranking results

India is the most attractive emerging market for the second year in a row

Top 10 emerging markets in the power sector, by Climatescope score

Climatescope score



India received the top Climatescope score for the second year running, but major shakeups in the top 10 show just how quickly markets can improve their fundamentals, opportunities and experience scores once they get their energy transition off the ground. India remains a well-established and competitive market for investment in the power sector. The Philippines has been on a growth path since 2021, and for the first time has entered second place in the ranking, knocking mainland China down a slot. Kenya and Nigeria both made huge gains in the positioning this year.

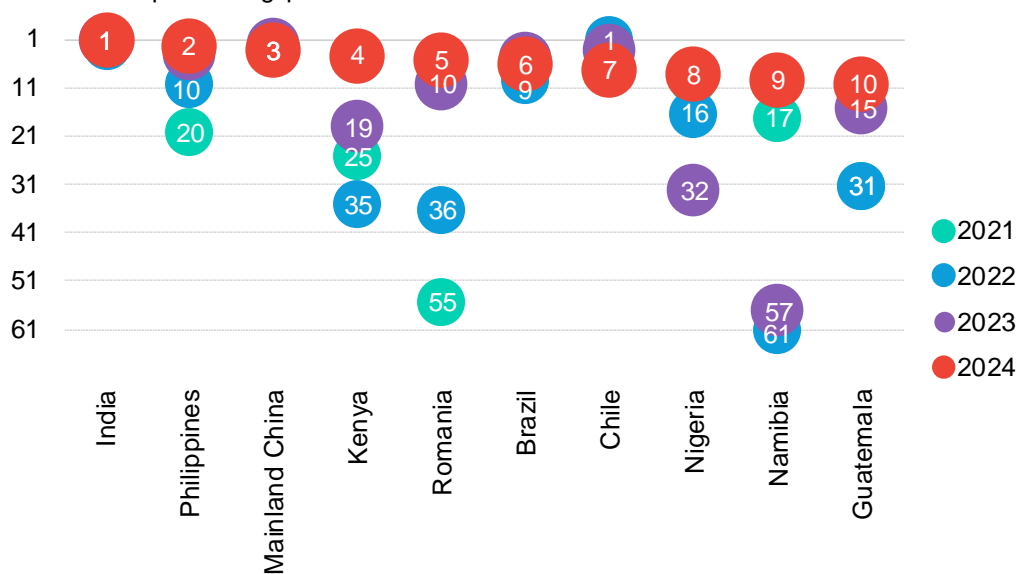
Guatemala and Namibia appeared for the first time in the top 10, while Chile left the top three after a decade on the podium. Mainland China, Brazil and Chile all remained stable in their policies and indicators, but the progress made in other markets, such as Romania, made them fall in the ranking.

Source: BloombergNEF. Note: Maximum score is 5. Fundamentals, opportunities and experience are the parameters that add up to a market's overall score for clean power. Between them, they encompass over 100 indicators, or individual data inputs collected by Climatescope researchers.

How markets' rankings have changed over the years

Current top 10 markets, and their variation in the ranking over the last four years

Climatescope ranking position



India, Chile, mainland China and Brazil have all been among Climatescope's top 10 markets since 2020, and the Philippines joined the group in 2022. While all five are now well-established emerging markets, they still have opportunities to grow their renewable energy assets.

No African market broke the top 10 in 2022 or 2023; this year, there are three: Kenya, Nigeria and Namibia.

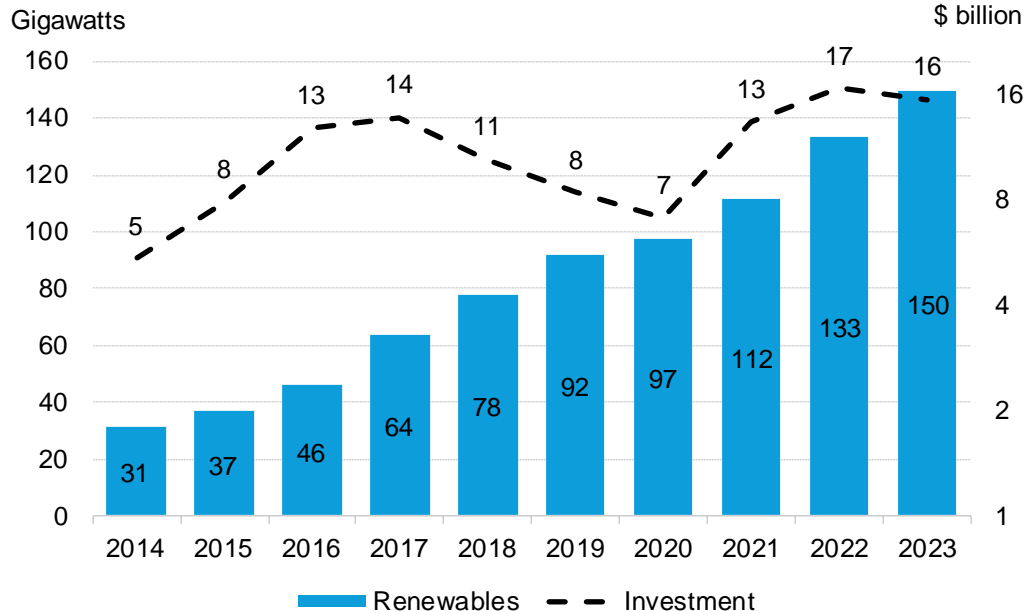
Guatemala was also a new entrant to the top 10, as it has started issuing international renewable energy certificates, or I-RECs, and approved bidding for new solar projects. Namibia's massive jump from 57th place to ninth place this year was largely influenced by an increase in its installed renewable capacity.

Source: BloombergNEF

1. India (1)



Total renewable energy installed capacity and investment in India, 2014-2023



Source: BloombergNEF. Note: Investment figures include small-scale photovoltaic solar. Renewable energy excludes nuclear and large hydro. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

India's first-place position for the second year running reflects both its bold renewable energy target and its ongoing efforts to achieve this goal. The government has a 2030 target of 500 gigawatts (GW) of installed capacity from sources other than fossil fuels, large hydro or nuclear. In 2023, it was 29% of the way there.

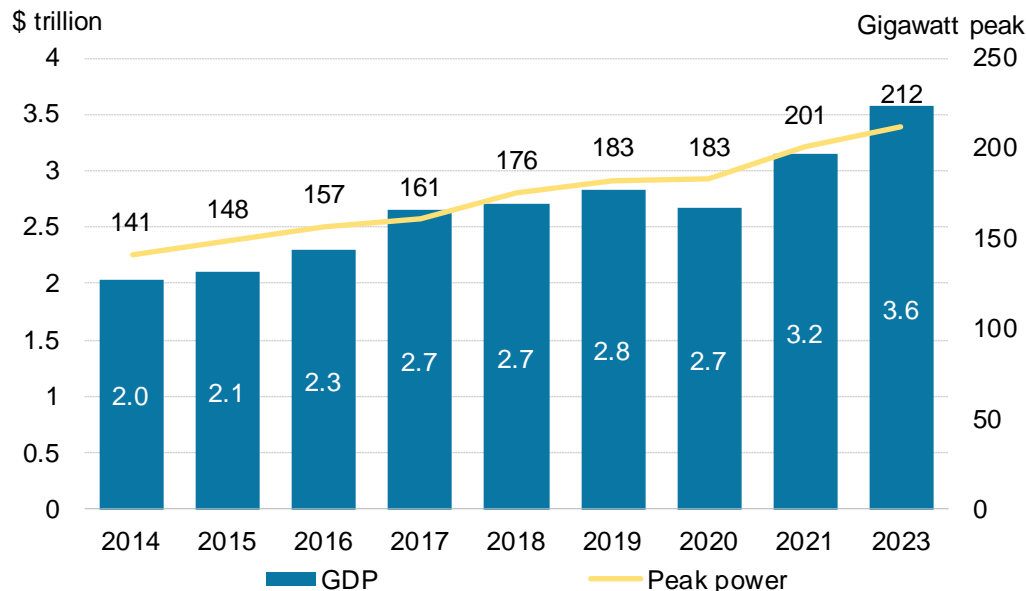
As result, the market has become a good investment destination for many domestic and foreign players, and it has garnered around \$61 billion in clean energy investment over the past five years. Of that, \$42 billion was invested in solar, and \$14 billion went to wind power plants.

According to BNEF's wind and solar forecasts, India is on track to achieve its target, as it is expected that the market will add another 1.6 terawatts (TW) of solar and 440GW of wind by 2030.

1. India (2)



GDP and peak power demand in India, 2014-2023



Source: BloombergNEF, International Monetary Fund (IMF). Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

Home to over 1 billion people and 17% of the world's population, India had the second-largest peak electricity demand anywhere in the world last year, at 212 gigawatts peak (GWp). On both the economic and the power-demand fronts, India is growing by leaps and bounds. The market's GDP reached \$212 billion, and it is expected to grow 63% within the next five years according to the International Monetary Fund (IMF). Since 2014, its national electrification rate has surged from 81% to 100%.

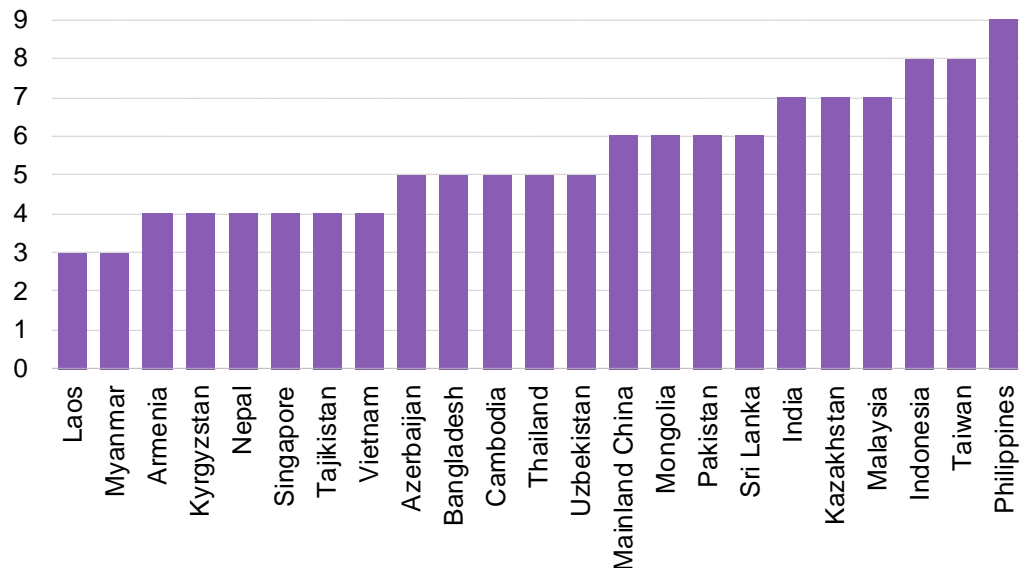
That all adds up to a big challenge – and a big opportunity. To cope with the ongoing demand surge and the increase in intermittent renewables on the grid, India approved a subsidy program to install 4 gigawatt-hours (GWh) of energy storage by 2030-31.

However, the carbon intensity of India's power sector reached 1,224 million metric tons of CO₂ equivalent (MtCO₂e) last year, the second-highest level in the world. The market continues to heavily rely on fossil-fuel generation, which accounted for 77% of total generation in 2023.

2. The Philippines (1)



Number of renewable energy policies in place in emerging markets in Asia Pacific



Over the past few years, the Philippines' significant progress in transitioning to renewable energy has propelled the market to second place in the Climatescope ranking – up from 20th place in 2021.

The government has established a target of 35% renewable energy in power generation by 2030, and the Philippines stands out as the only emerging market in the Asia Pacific region (APAC) to have all of the renewable energy policies surveyed by Climatescope – auctions, net-metering schemes, tax incentives and a clean energy target – in force.

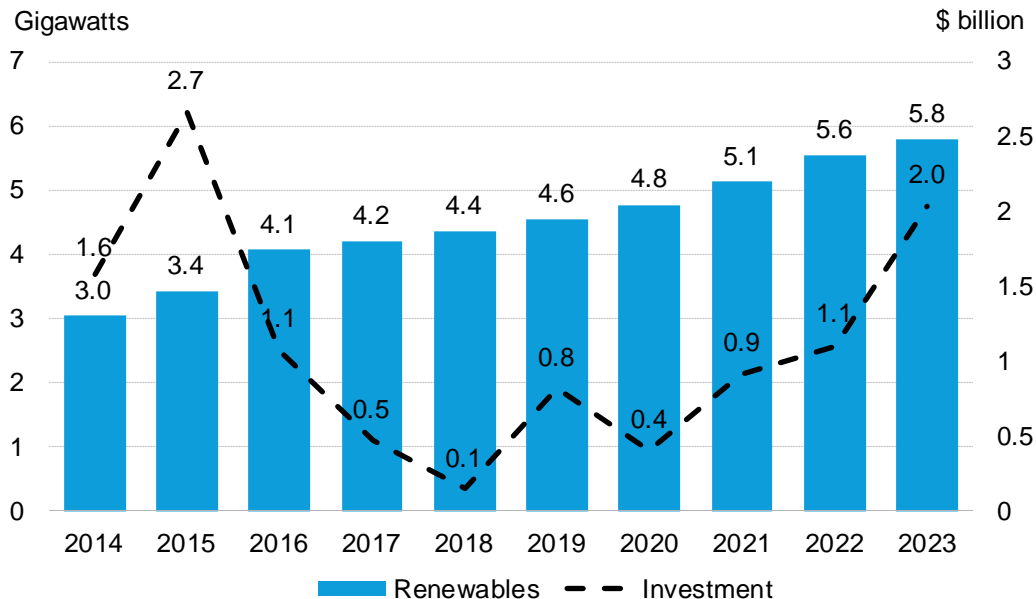
With power demand increasing and the market still heavily reliant on fossil fuels, however, the Philippines has room to grow its renewable energy capacity. Peak demand increased 63% from 2014 to 2023, reaching 19.2GWp in 2023.

Source: BloombergNEF. Note: Policies considered in the chart are: auction/tender, feed-in tariff, renewable energy target, net metering, value-added tax (VAT) reduction/exemption, import tax reduction/exemption, priority grid access, renewables mandate, renewable energy certificates. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

2. The Philippines (2)



Renewable energy installed capacity and investment in renewables over 2014-2023



The Philippines has attracted \$5.2 billion over the past five years, but only 7% of that sum came from foreign investment.

In the past, foreign investors faced a 40% limit on foreign equity in the Philippines. New incentives could soon ease these restrictions, allowing foreign investors to hold 100% equity in the exploration, development and utilization of solar, wind and hydro projects.

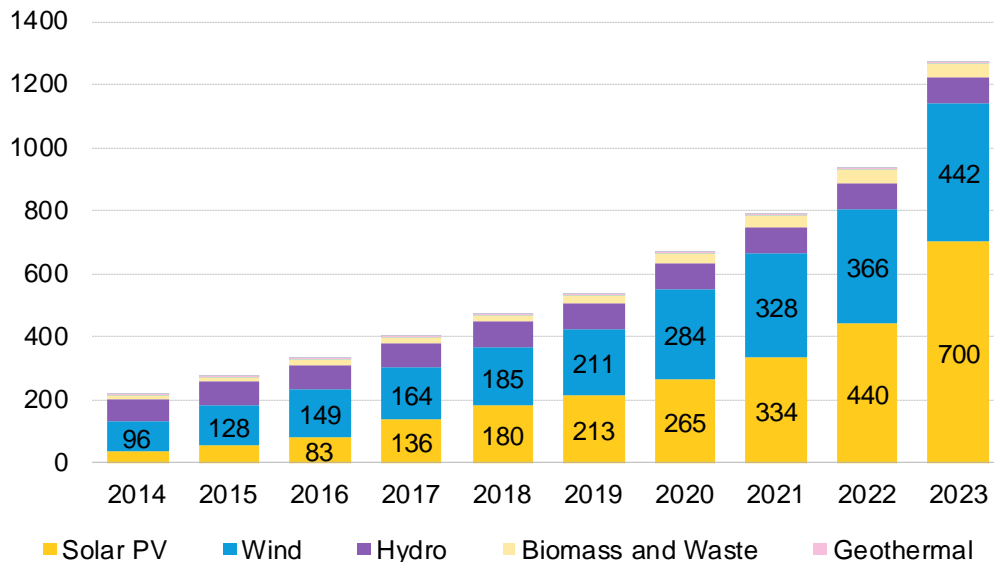
Source: BloombergNEF. Note: Investment figures include small-scale solar. Renewable energy excludes nuclear and large hydro. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

3. Mainland China (1)



Installed renewable capacity in mainland China, by technology

Gigawatts



Mainland China continues to play a key role in the global energy transition, and this year it ranks third in Climatescope's most attractive emerging markets for clean energy investment. The Asian giant accounted for 1.26TW of installed renewable energy capacity in 2023 – or 41% of the world's total – and generated 2 terawatt-hours (TWh). The 260GW of solar mainland China single-handedly added in 2023 was significantly more than half of the 435GW added globally.

Mainland China was responsible for attracting 70% of clean energy asset investment directed to emerging markets in 2023. Among the top five markets on the Climatescope ranking, Mainland China attracted almost 10 times as much as the four other markets together.

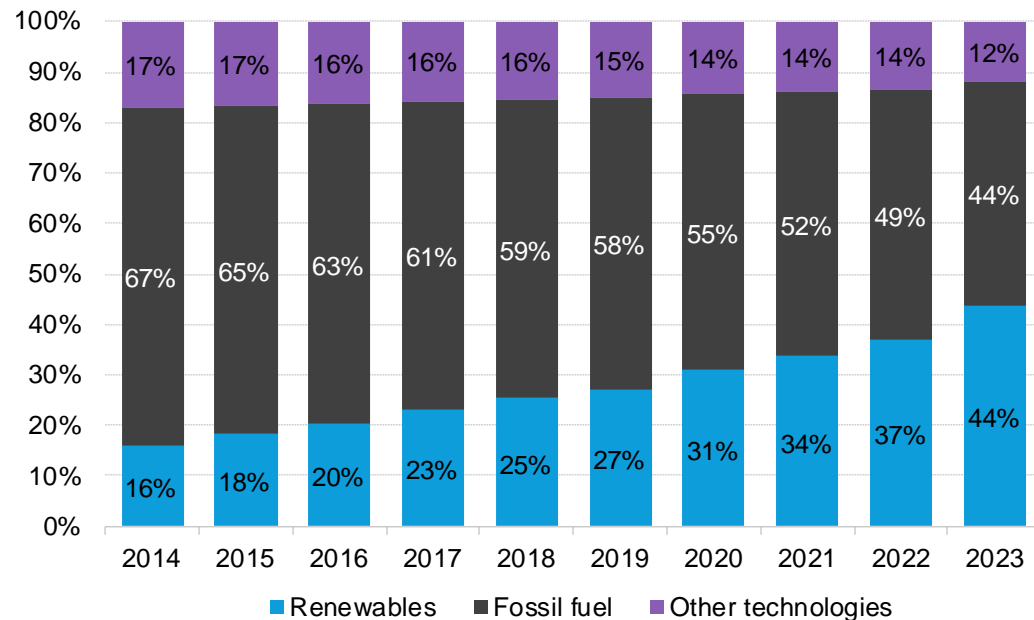
It also saw the world's highest peak power demand last year, at 1390GWp – 32% higher than its peak five years before.

Source: BloombergNEF. Note: Renewable energy includes small-scale PV and excludes nuclear and large hydro. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

3. Mainland China (2)



Share of installed capacity in mainland China, 2014-2023



For the first time ever, in 2023, renewables commanded a share of installed capacity in mainland China equal to that of fossil fuels. Both represented 44%; other technologies, including nuclear and large hydro, made up the remaining 12%.

This illustrates both the rapid growth of renewables in the market and the wider opportunity for the deployment of clean technologies there.

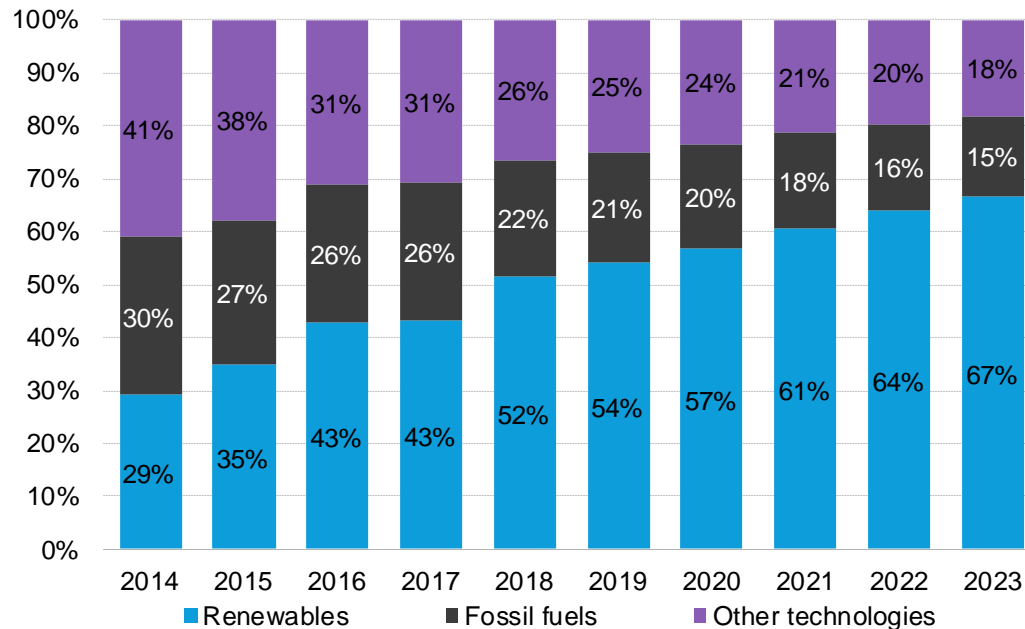
Mainland China has already smashed its 2030 target of installing 1.2TW of wind and solar capacity. Yet despite these surging renewable additions, the market is not on track to meet its target of an 18% reduction in carbon intensity by 2025. In 2023, mainland China's power sector emitted 6,255MtCO₂e, the highest figure anywhere in the world.

Source: BloombergNEF. Note: Renewable energy excludes nuclear and large hydro. Other technologies include nuclear and large hydro. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

4. Kenya (1)



Share of installed capacity in Kenya, 2014-2023



Kenya has seen an important decline in its reliance on large hydropower over the past decade, as other renewables took on an increasing share of total installed capacity. Since 2014, large hydro capacity in Kenya has remained flat at around 725 megawatts (MW), with no new capacity added over the past 10 years. During this period, renewable capacity surged from 518MW to 2GW, driven by solar, which now accounts for 29%, or 1.1GW, of total installed capacity.

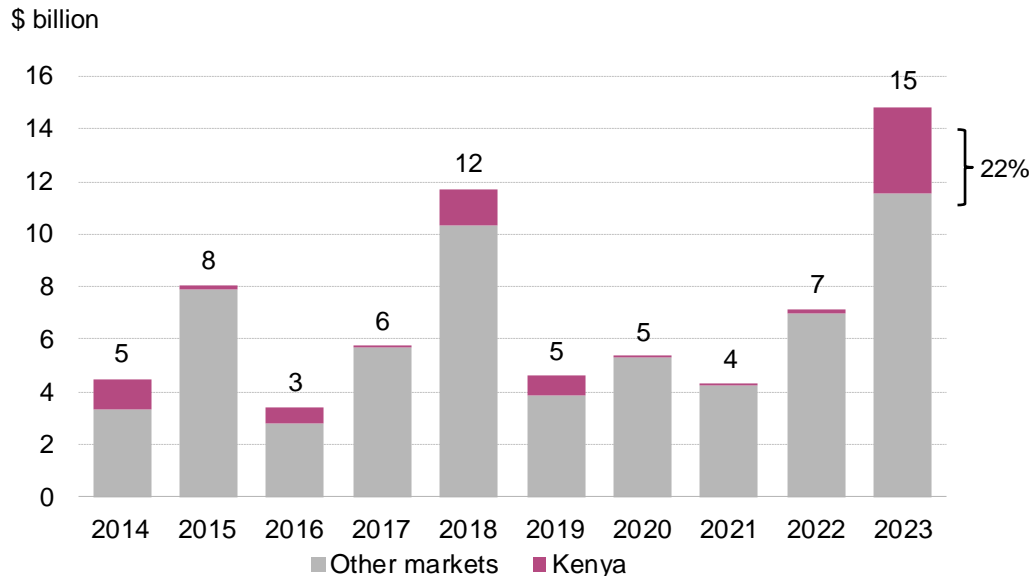
In 2023, Kenya has pledged to reach net-zero emissions by 2050 and was the first African market to commit to a fossil-fuel phase-out for coal, gas, and oil by 2030. That's a significant step, although the trend away from fossil fuels was already well under way: fossil fuels' share of Kenya's capacity mix dropped from 30% at the beginning of the decade to 15% in 2023.

Source: BloombergNEF. Note: Renewable energy excludes nuclear and large hydro. Other technologies include nuclear and large hydro. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

4. Kenya (2)



Renewable energy investment in Africa, 2014-2023



Kenya attracted more than a fifth of Africa's energy-transition investment last year. Of the \$3.2 billion that flowed to the market – more than twice as much as it attracted over the previous five years together – over 90% came from foreign investment.

Geothermal alone accounted for \$3 billion of the total. Currently, the technology accounts for 23% of total installed capacity, surpassing the 15% share from fossil fuels.

Offering flexible financing for grid connection costs and solar home systems, Kenya has rapidly increased electricity access for its citizens through a combination of on- and off-grid solutions. The market has seen a significant jump in the national electrification rate over the past decade, rising to 76% in 2023 from 36% in 2014.

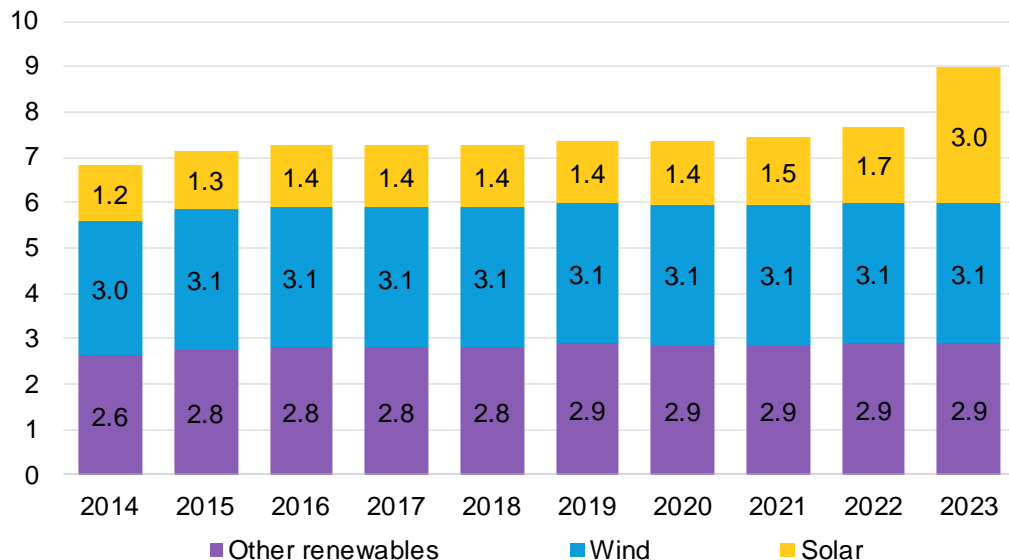
Source: BloombergNEF. Note: Investment figures include small-scale photovoltaic solar. 'Other markets' includes Algeria, Angola, Benin, Botswana, Burundi, Burkina Faso, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Ghana, Ivory Coast, Lesotho, Liberia, Madagascar, Mali, Morocco, Senegal, Sierra Leone, Somalia, Tanzania, Togo and Uganda. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

5. Romania (1)



Installed renewable capacity in Romania, by technology

Gigawatts



Romania vaulted from 36th place in Climatescope's 2022 ranking to fifth place this year thanks to recently adopted policies that attracted \$2.8 billion in renewable energy investment last year. That's the highest such figure since at least 2010.

At the end of 2023, Romania launched its first contract-for-difference (CfD) auction, which could kickstart a new era for the renewables sector. The winning project will receive a 15-year power purchase agreement (PPA) to build 1GW of onshore wind and 500MW of solar through 2025.

Solar for commercial and residential surged from 2022 to 2023, boosting installed solar capacity 76%, to 3GW. That's nearly equal to the 3.1GW of installed wind, which has stayed essentially flat for a decade. Together, the two technologies now represent more than two-thirds of Romania's clean power matrix (excluding large hydro).

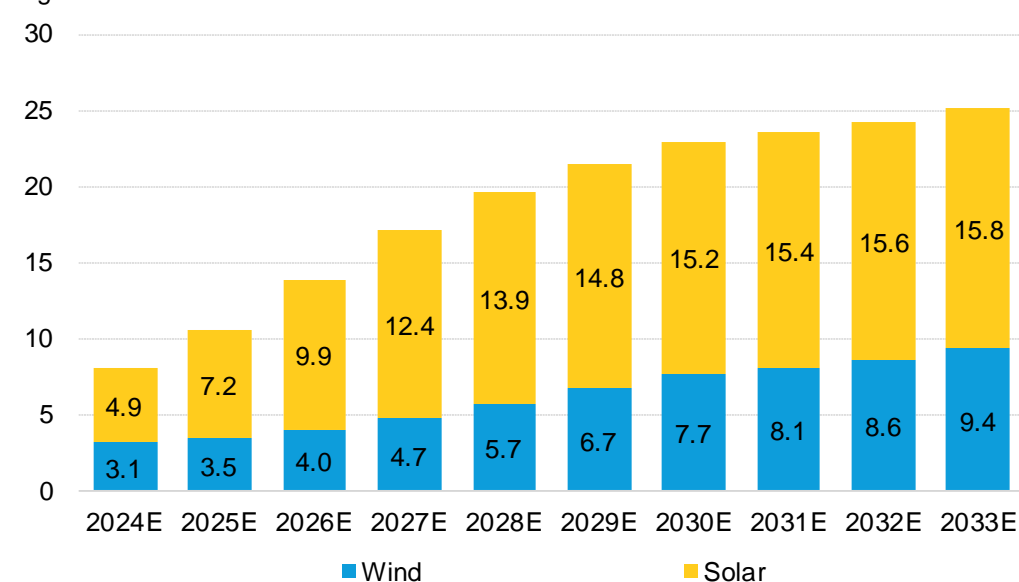
Source: BloombergNEF. Note: 'Other renewables' include geothermal, small hydro and biomass. Small hydro is up to 50 megawatts. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.

5. Romania (2)



Forecast for installed solar and wind installed capacity in Romania

Gigawatts



Despite making good progress over the past few years, Romania is still preparing for the renewable energy capacity additions that are to come. Improving and expanding its grid infrastructure is key. The Romanian Transmission and System Operator (TSO) has already published a grid extension and upgrade plan to be completed by 2030. BNEF forecasts see Romania adding 76GW of solar and 35GW of wind through the end of this decade, a massive increase from the 2GW of solar and 3GW of wind the market had installed in 2023.

The market is also focusing on energy storage solutions, to ensure stability as intermittent renewables' share of the capacity mix expands. The EU has already approved a \$103 million financial aid package to help Romania boost its energy storage, and the market is targeting 2.5GW of battery storage by 2025 and 5GW by 2026.

Source: BloombergNEF. Note: Includes both small-scale and commercial solar. Icons in the top right corner represent Climatescope weighted scores relative to each parameter, where Fundamentals accounts for 50%, and Opportunities and Experience count for 25% each. When all three parameters are summed, the maximum Climatescope score is 5.



04.

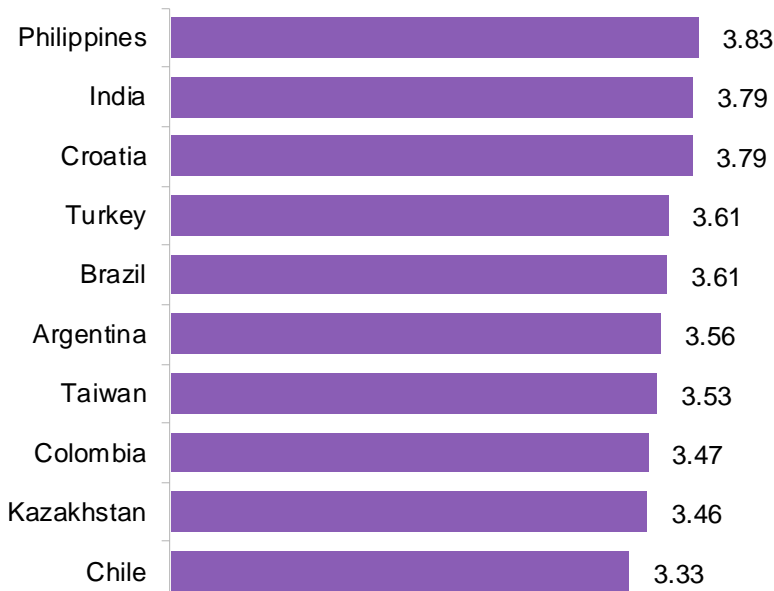
Fundamentals

Key policies, power market structure, barriers and incentives

A solid policy foundation is key to ensuring a market's success

Top 10 emerging markets for fundamentals

Climatescope score



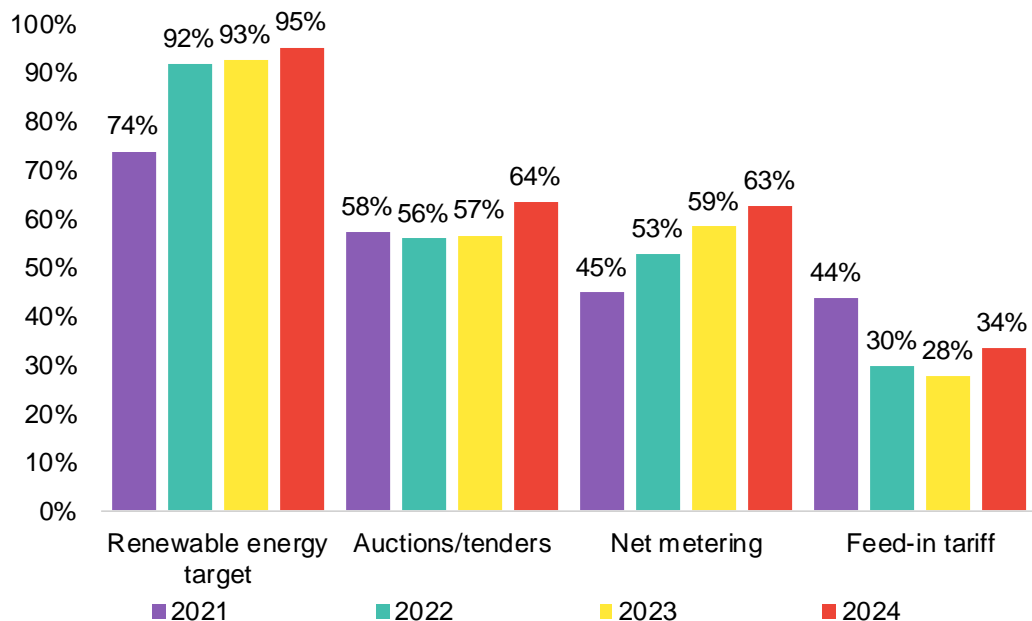
The **fundamentals** parameter encompasses the foundational mechanisms for renewable energy development in a market. This includes a market's clean-energy policies, operating rules and incentives, as well as barriers to the deployment of investment.

Stable, well-defined enabling environments remain critical to attracting investment – particularly private capital. Markets with weak fundamentals scores see minimal deployment of clean power technologies.

Source: BloombergNEF. Note: Maximum score is 5. For more details on which indicators are considered within this parameter, see the Methodology section at the end of this report.

Clean energy policies are setting adoption records in emerging markets

Share of emerging markets with key policy mechanisms in force, 2021-2024



Source: BloombergNEF

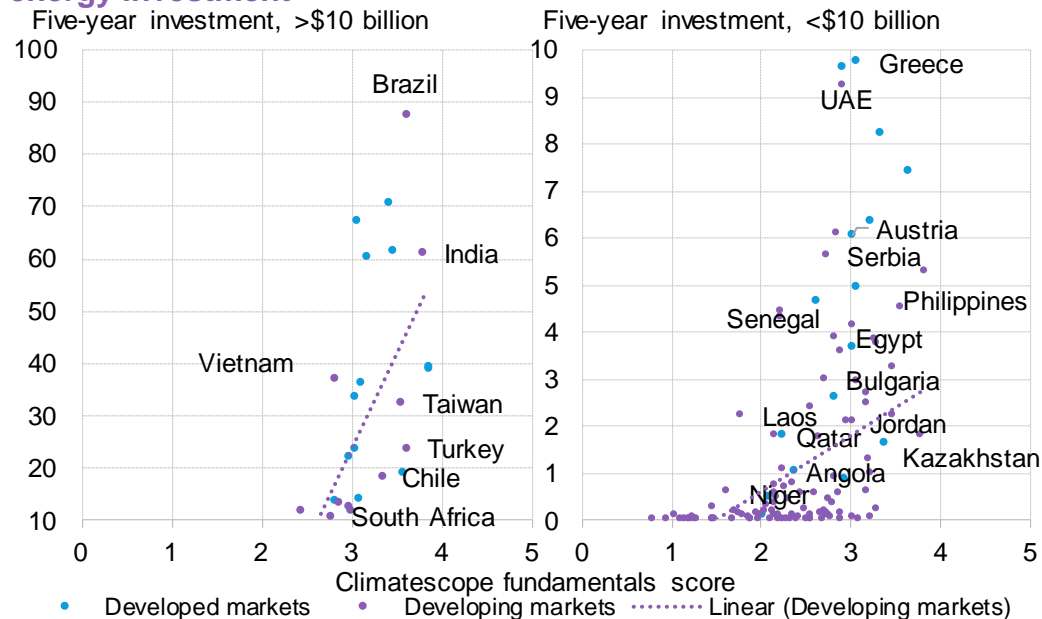
Four types of policy are central to the Climatescope fundamentals, and all four of them have seen year-on-year growth. That's critical, because a combination of these policies is usually essential for a successful market.

As of 1H 2024, 95% of Climatescope's emerging markets have renewable energy targets in place. This marks a 21-percentage-point increase from 2021. The boom was largely driven by African markets, seven of which adopted targets over the past three years.

Auctions/tenders for clean power delivery contracts and net metering continue to grow in emerging markets, while feed-in tariffs (FiT) are following a different pattern. In 2024, 64% of markets surveyed had auction policies in force, compared with 58% in 2021. Net metering is now present in 63% of emerging markets, compared with 45% in 2021. FiTs had been losing ground, but they seem to have turned a corner. This policy mechanism is now available in 34% of emerging markets, compared with 28% in 2023, although it remains 10 percentage points lower than the share in 2021.

Ensuring policy availability is key to unlocking investment

Climatescope fundamentals score versus five-year renewable energy investment



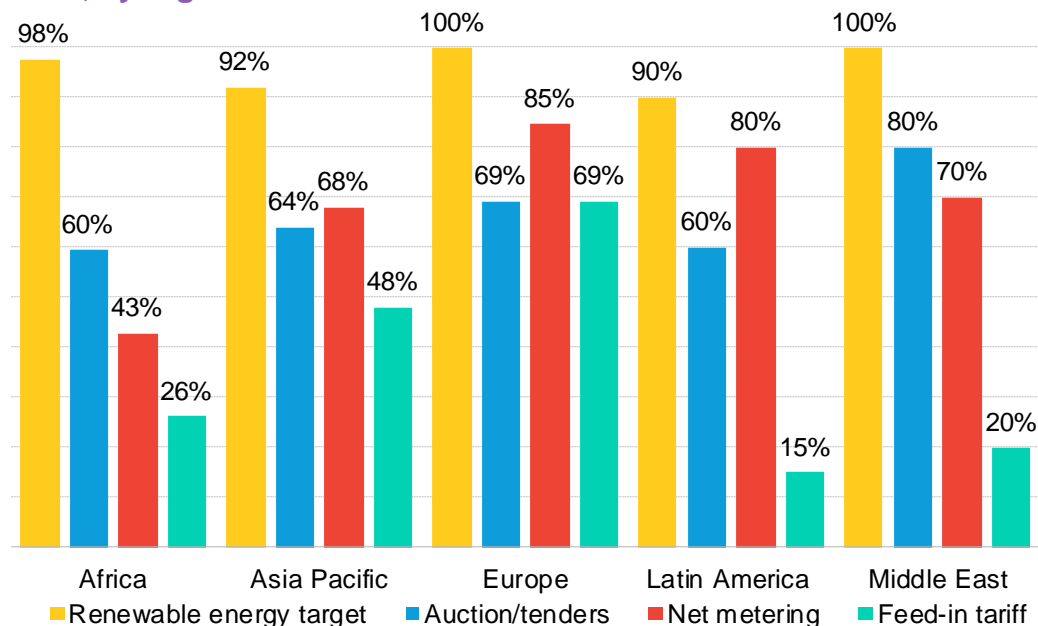
Source: BloombergNEF. Note: The chart excludes mainland China and the US due to their outlier values. Climatescope fundamentals score encompasses a market's key policies, market structure and barriers that could hinder investment. Investment includes new-build asset finance and small-scale solar.

Policies play a critical role in mobilizing capital. By the same token, lack of a proper enabling environment is one of the key barriers to unlocking capital across emerging markets. Comparing policy scores with levels of attracted investment highlights this relationship, as markets that have better fundamentals scores tend to also have higher investment rates.

Among the 15 developed and emerging markets that topped the Climatescope fundamentals score table, the average cumulative investment over the last five years was \$30.7 billion. Meanwhile, the 15 markets that finished at the bottom of the ranking averaged \$70 million.

Adoption rates for key policies are not evenly distributed

Share of emerging markets by key policy mechanisms in force in 2024, by region



Renewable energy targets are the most popular policy choice in emerging markets. Africa, where 98% of markets have such a target in place, has seen particularly significant progress on this front, up 10 percentage points in just two years.

Auctions are widely diffused in emerging markets, and are the second-most-popular policy globally.

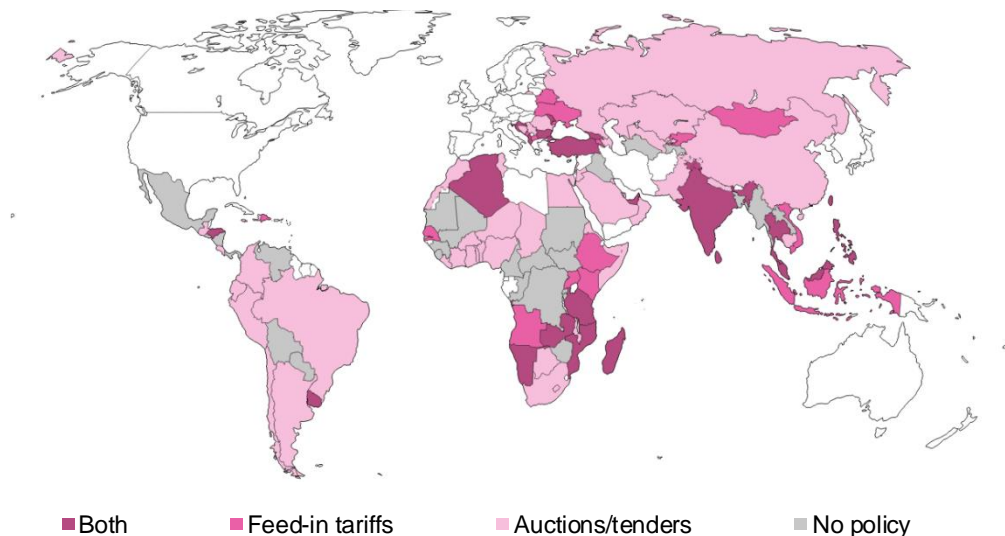
Net metering has had a growth spurt in the past few years. In many emerging markets, mini-grids and rooftop panels have been used to provide electricity to rural communities or help prevent grid issues. In all regions but Africa, at least two-thirds of emerging markets have adopted this mechanism.

FiTs are the least popular policy in all regions. As first movers in renewable energy policies, 70% of European emerging markets have FiTs in place. But many other regions are skipping this step, and instead jumping directly to more robust policies, such as auctions.

Source: BloombergNEF. Note: Data includes renewable energy targets, feed-in tariffs, net metering/billing and auction/tender policies for emerging markets only.

For the first time, more than 60% of emerging markets had renewable energy auctions in force

Emerging markets with auctions, feed-in tariffs or both



As of 2024, 70 of the 110 emerging markets surveyed in Climatescope have auction schemes in force. This marks a significant growth from the previous year, when 63 markets had this policy in force. Feed-in tariffs also saw growth, from 32 markets in 2023 to 37 in 2024. However, only 21 markets have both policies in force. The availability of such policies offers more competitiveness and stability for project developers.

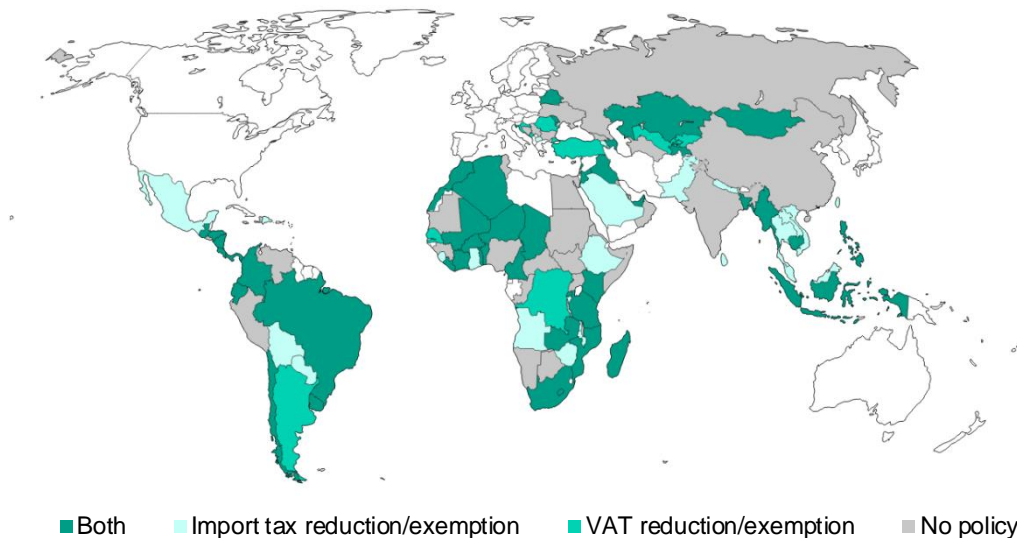
Among regions, the Middle East has the highest auction adoption rate as of 2024, at 80%. European emerging markets follow, with 69%. African markets were initially slow to adopt these policies but have recently made significant strides, and the region is now tied with Latin America at 60%.

Africa also has the second-highest concentration of markets with both auctions and FiTs in place; only Asia has more.

Source: BloombergNEF. Note: Includes 110 emerging markets surveyed through the end of July 2024. Mapped data are for distinct economies.

Tax incentives can be key to deployment of renewables

Tax incentives in emerging economies, by market



Tax incentives are another important policy for attracting project developers and subsidizing upfront costs.

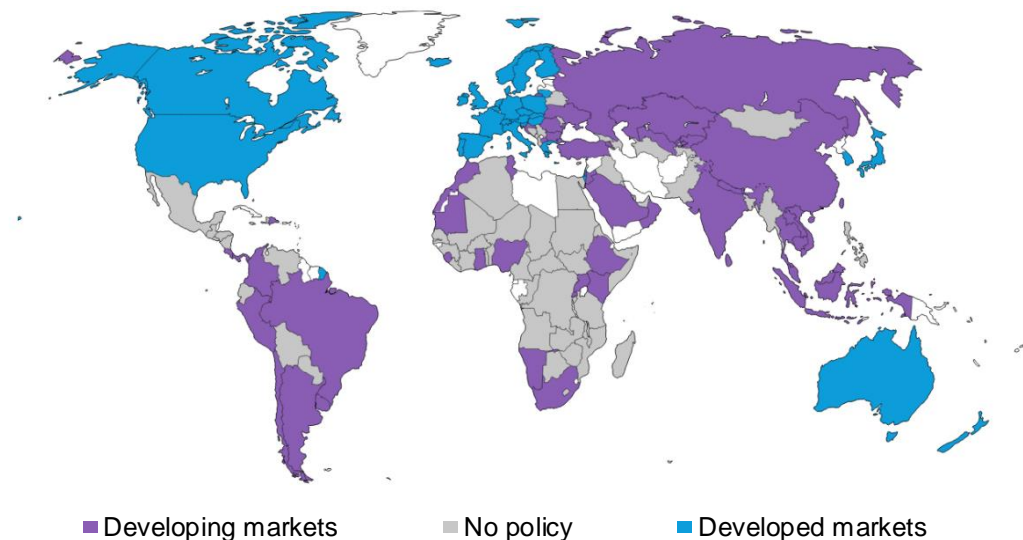
In 2024, 42% of emerging markets have both import tax and value-added tax (VAT) exemptions or reduction policies in force. Most of these are concentrated in Africa and have been in place since the early 2010s. This mechanism is especially attractive for developers who want to engage in solar projects, as most of the incentives are applicable to solar panels and energy storage components.

Import tax exemptions/reductions are more popular than VAT exemptions/reductions, for the simple reason that many markets do not have a VAT.

Source: BloombergNEF. Note: VAT refers to value-added tax. Mapped data are for distinct economies.

Over 40% of emerging markets have a net-zero target

Net-zero targets in force, by market



As of 1H 2024, 44% of the emerging markets covered by Climatescope have net-zero targets in place. Out of these targets, over 40% were established in 2021 alone. The presence of a target is important, but most of these markets still have a long way to go to decarbonize their power sectors, since coal and natural gas still play a significant role in generation.

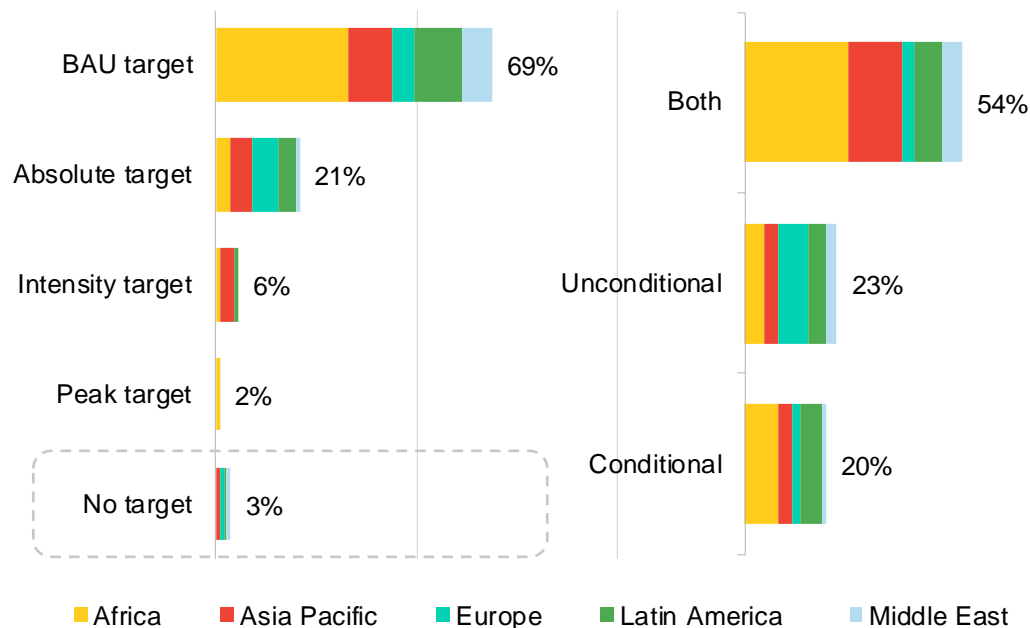
Meanwhile, all developed markets surveyed by Climatescope have a net-zero target in place. Some markets, like Australia and Canada, have both national and subnational targets. The UK and Slovakia shut down their last coal-fired power plants in 2024, joining Sweden, Portugal and Belgium as the markets that are making significant strides towards net zero.

Nearly two-thirds of emerging markets in Asia have a net-zero target. Africa has the lowest adoption rate, as only 28% of the continent's emerging markets have a binding net-zero target.

Source: BloombergNEF. Note: Includes 140 markets surveyed through the end of July 2024. Mapped data are for distinct economies.

Almost 70% of emerging markets have a business-as-usual-based NDC targets

Emerging markets' NDC targets, by type and conditionality



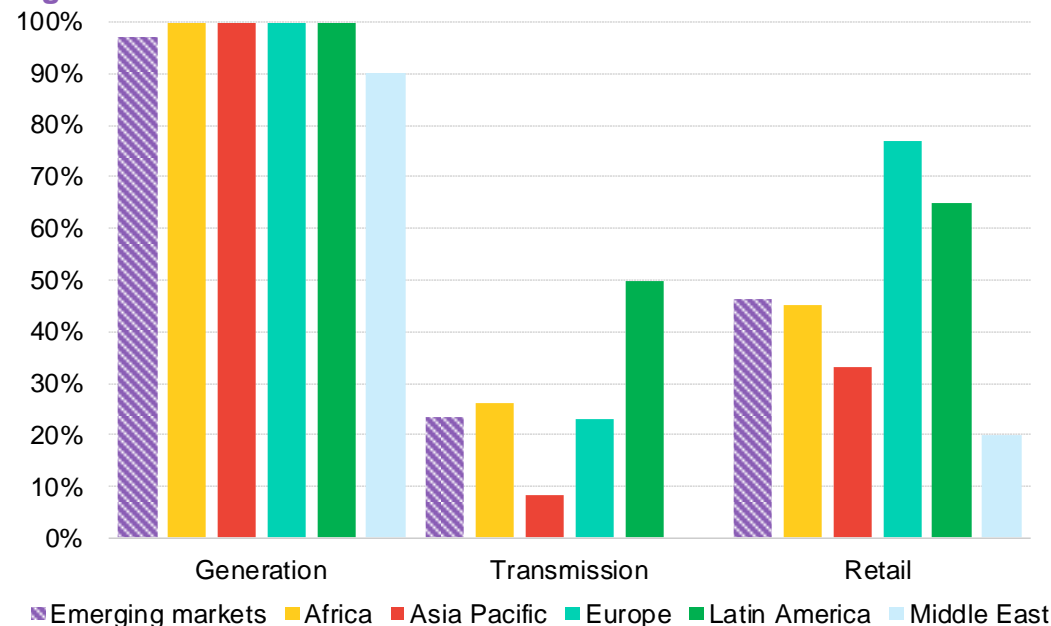
As of 1H 2024, almost all emerging markets have a nationally determined contribution (NDC) target in place. Almost 70% of these are business-as-usual (BAU) targets, which pledge to decrease greenhouse gas (GHG) emissions against a baseline scenario that takes current trends in population, economy, technology and behavior into account. Absolute targets, which involved reaching a fixed level of greenhouse gas emissions, are present in 21% of the surveyed markets. Over half of emerging markets have both conditional targets, which depend on external financial and technical support to be implemented, and unconditional targets in their NDC submissions. This signals the markets' understanding of their potential and limitations when it comes to cutting GHG emissions.

Different regions tend toward different pathways for their pledges. European markets represent one-third of the unconditional NDC targets, while African markets account for a third of the conditional NDCs.

Source: BloombergNEF. Note: Excludes Taiwan as it does not have a nationally determined contribution (NDC). BAU refers to business-as-usual. "No target" includes Bahrain, Bolivia and Nepal. Although those three markets have submitted an NDC, none of them have specific emissions reduction targets.

Generation is the power sector segment most welcoming to private players in emerging markets

Utility privatization in emerging markets in 2024, by segment and region



Allowing private players to contribute to generation, transmission and retail is key to ensuring adequate competitiveness in a market. In emerging markets – and especially those that lack experience – private sector participation can help markets boost competitiveness, lower costs and mobilize capital.

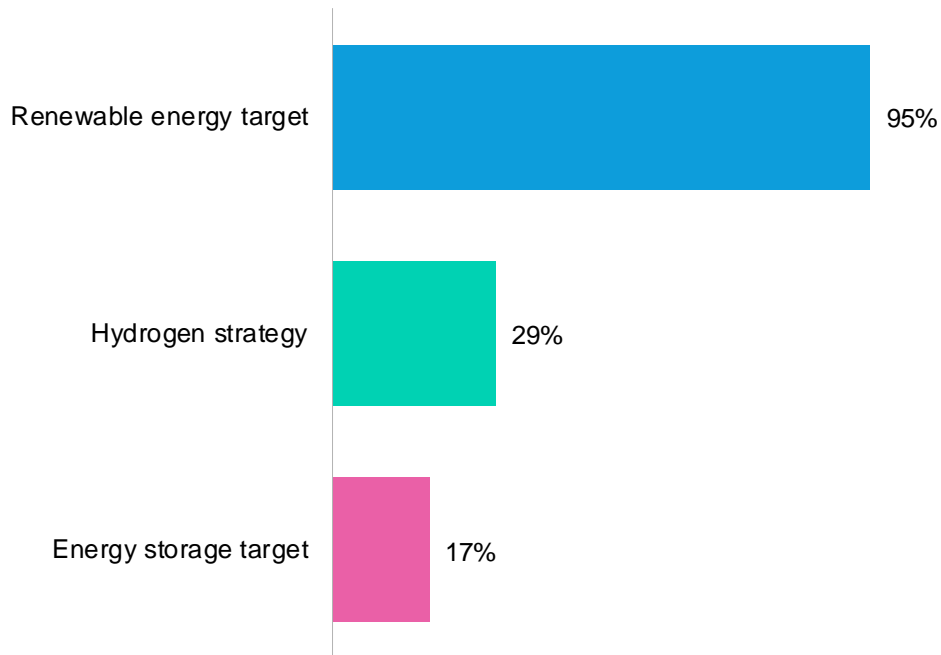
The generation segment has proven to be the first option for liberalization among emerging markets. Across all regions, only the Middle East has not fully opened generation up to the private sector. Introducing private players allows governments to meet electricity needs without over-burdening budgets as demand for electricity soars.

Transmission and retail tell a different story. Privatization of both segments varies widely by region, but the retail market tends to be more open than transmission, as security and reliability concerns push governments to keep transmission under state management.

Source: BloombergNEF

A small number of emerging markets have set targets beyond renewables

Share of emerging markets with a given kind of target in force



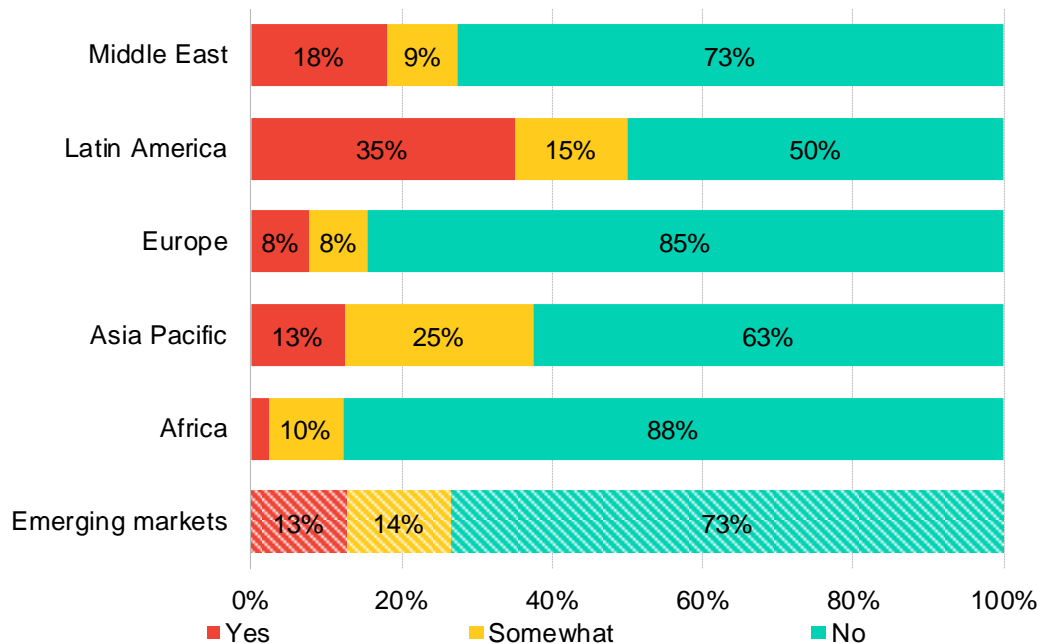
Renewable energy targets are the major player when it comes to energy transition strategies, but targets focused on hydrogen and energy storage have started to see uptake in emerging markets, too. Increased renewable energy adoption rates, a lack of grid infrastructure and concerns about curtailment have led 17% of Climatescope emerging markets to adopt energy storage targets.

Hydrogen strategies are also gaining pace in emerging markets. As of 1H 2024, 29% of emerging markets have a hydrogen strategy, while another 11% having strategies under development. The interest in developing hydrogen projects is timely for many emerging markets, which often have good solar and wind resources, as well as potential for biomass and hydroelectricity. As the world starts imposing more stringent measures to reduce emissions, many developing economies can play a pivotal role by producing and exporting green hydrogen and commodities.

Source: BloombergNEF

Latin America has seen the highest rates of curtailment risk in emerging markets

Share of emerging markets with observed curtailment risk



Source: BloombergNEF

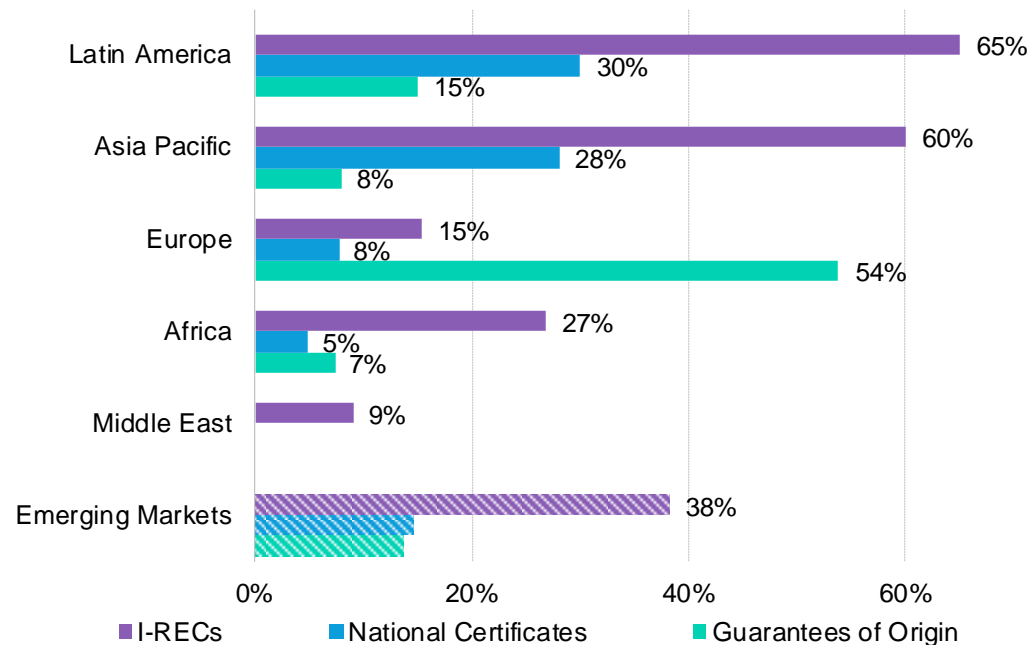
As renewable penetration rises in emerging markets, more and more markets are facing curtailment risk. That's a problem: curtailment is a key barrier to the development of renewable energy projects as it hinders growth and limits returns.

Overall, 13% of the emerging markets covered saw curtailment issues present in their markets as of 1H 2024. Another 14% saw some presence of curtailment risk over the same period. Countries that are marked as "Yes" saw curtailment as a large impediment for renewable progress, while countries in the "Somewhat" category have seen curtailment but not on a significant scale. The remaining 73% of markets have not faced major curtailment issues.

Latin America has the biggest share of curtailment of any region. Europe and Africa saw the lowest rates. European markets have the highest rates of preferential dispatch for renewables, which determines which technology gets added to the grid first and enables regulators to prioritize reliability. African markets have the lowest renewable penetration rates, limiting the likelihood of curtailment.

Half of all emerging markets have some form of renewable energy certificates

Share of emerging markets with RECs, by type and region



In 2024, half of the emerging markets covered by Climatescope have some form of renewable energy certificate (REC) in place. This market-based instrument has been implemented over the years and represents proof that one megawatt-hour (MWh) of renewable energy has been generated and fed into the grid.

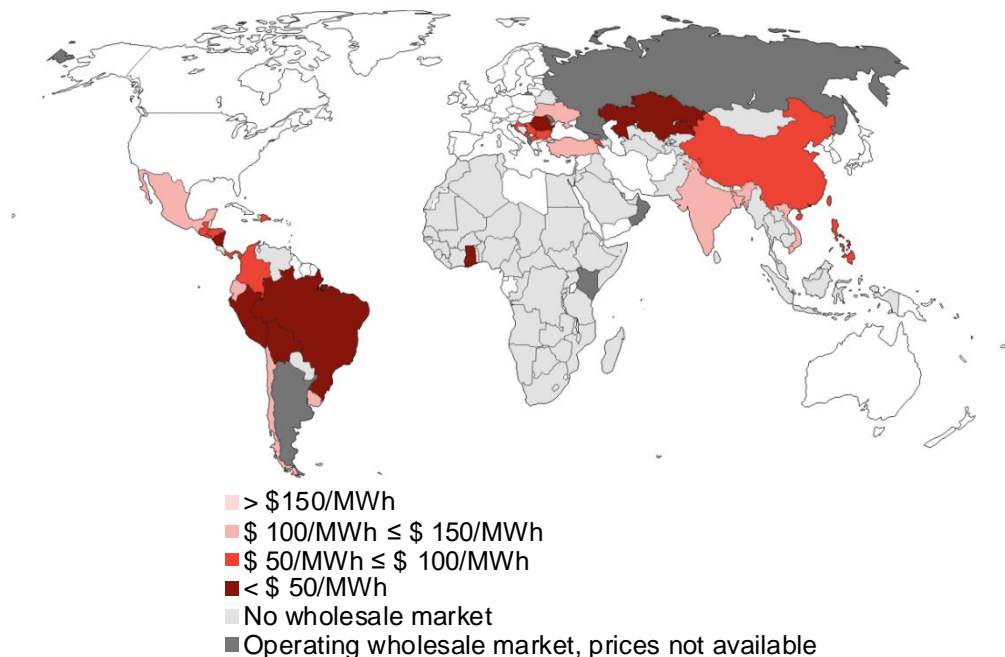
While there are multiple forms of certificates, the most common is the I-REC, present in nearly 40% of emerging markets. This certificate is designed to operate internationally and enables multinational organizations to improve supply chain transparency.

State-based certificates, which are a guarantees that a given amount of power was produced at a renewable energy power plant and are traded within a specific territory, are concentrated in specific regions. Guarantees of origin are mainly present in Europe, where 54% of markets issue this form of certificate. So-called national certificates are present mainly in Asia and Latin America, where around 30% of markets having this policy in force.

Source: BloombergNEF. Note: Only considers national level certificates. I-REC refers to international renewable energy certificate.

Wholesale markets are expanding but remain limited

Wholesale market status and average prices in emerging markets



Out of the 110 emerging markets covered in Climatescope, only 39 have operating wholesale electricity markets as of 1H 2024. Among the 82% of markets with available wholesale prices, the average price in emerging markets reached \$86.8/MWh in 2023. But the prices range drastically: the highest registered value was \$186.8/MWh, seen in Singapore, while Ghana saw the lowest figure, at \$8.78/MWh.

Wholesale power markets are also not spread out evenly across regions. Europe has the highest wholesale market adoption rate, at 85%, followed by Latin America at 75%. The lowest wholesale market availability was seen in Africa, where only Ghana and Kenya have operating markets.

Source: BloombergNEF. Note: MWh is megawatt-hour. Mapped data are for distinct economies.



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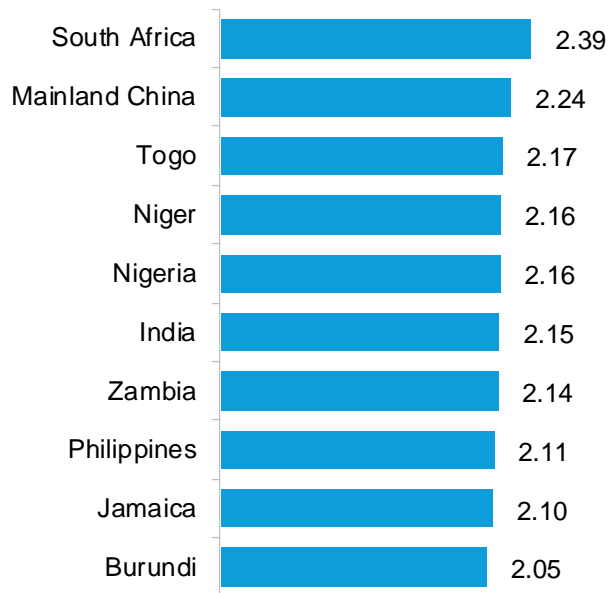
Opportunities

Macroeconomics, prices and costs

There is no shortage of opportunities in emerging markets

Top 10 emerging markets for opportunities

Climatescope score



The opportunities parameter focuses on identifiable traits that mark a market's attractiveness to investors, including policies that enable private markets and barriers that can be turned into engines for growth.

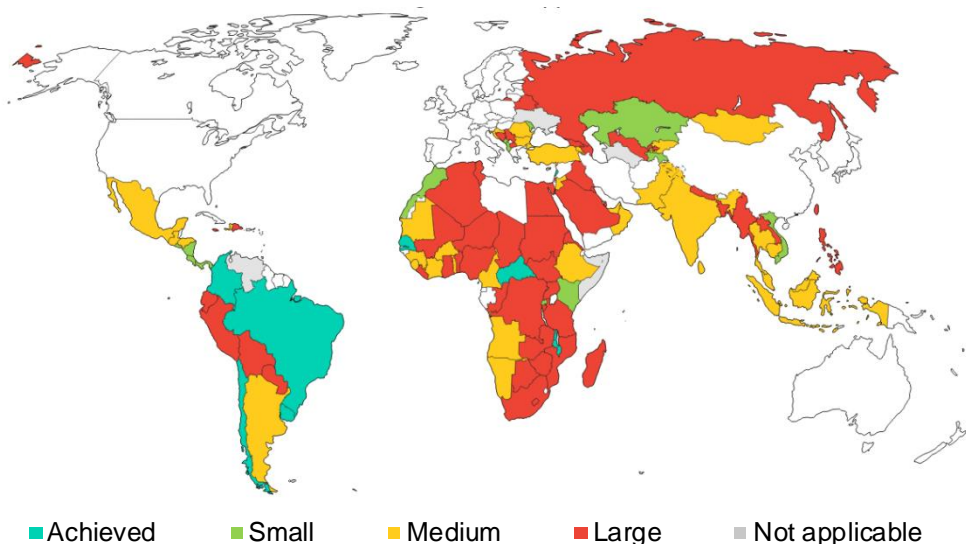
On a more granular level, average electricity prices and variations in power prices are key factors for measuring opportunities. So are generation growth rates, peak demand figures, and whether or not markets are on track to reach their announced renewable energy targets.

Finally, a market's macroeconomics indicators – like forecast population and GDP growth – provide short- to medium-term perspective on the market's upcoming needs. This in turn helps clarify the certainty or uncertainty of doing business in that market, paving the way – or not – for investors.

Source: BloombergNEF. Note: Maximum score is 5. For more details on which indicators are considered within this parameter, see the Methodology section at the end of this report.

Most emerging markets have a long way to go to reach their renewable targets

Gap to achieving renewable energy targets in emerging markets



Renewable energy ambitions have risen globally. As of 1H 2024, 95% of emerging markets have such targets in force. Yet in many of these markets, significant gaps remain between the target and the current state of affairs.

Among the emerging markets surveyed in Climatescope, just 7% have reached their set targets. More than three-quarters have a medium to large gap, while 9% have a small gap to meeting their goals.

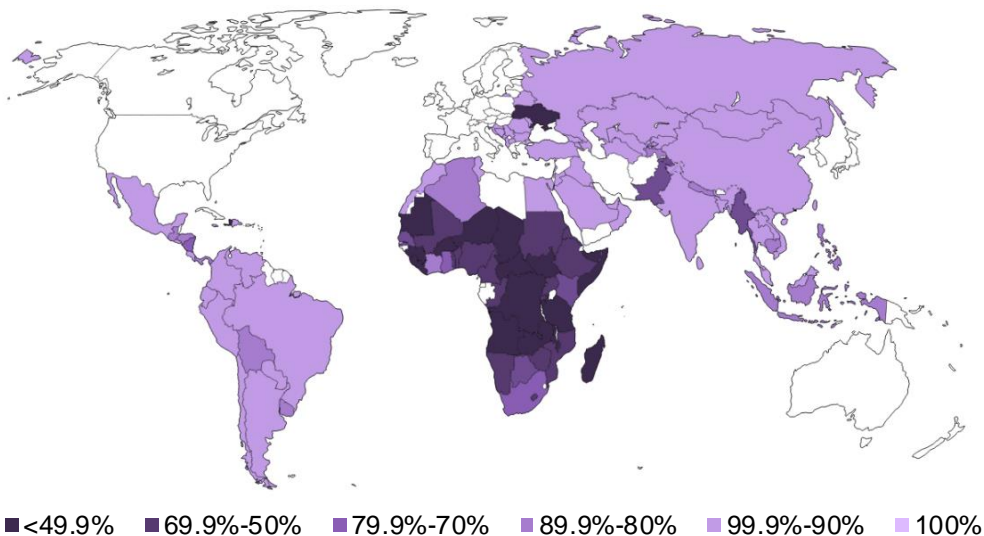
Only two emerging markets have yet to set a renewable energy target: the Democratic Republic of Congo and Turkmenistan.

Most emerging markets have set targets for 2030, reflecting a global awareness that time to keep global warming under the limits set by the Paris Agreement is running out. Meeting these ambitious targets will require that governments support and incentivize clean energy buildout – while also ensuring both stability and continuity for customers.

Source: BloombergNEF. Note: 'Small' is up to 20%; 'Medium' is 20-50%; 'Large' is over 50%. Does not include markets that do not have a target in force. Mapped data are for distinct economies.

Half of all emerging markets still lack access to universal electricity

Electrification rates in emerging markets



As of 2023, 50% of emerging markets now have universal access to electricity, meaning 100% of the population has reliable access, up from 35% in 2014.

Bangladesh saw the most drastic change over the past decade, raising its electrification rate to 100% last year from just 62% in 2014. This leap was mainly driven by increased private sector participation in generation, improved efficiency of transmission and distribution, and new capacity additions. However, most of Bangladesh's power demand has been met with fossil fuels, and renewables accounted for just 6% of the market's installed capacity in 2023.

Africa still struggles with electricity access rates, but it has improved considerably since 2014. In the last decade, the number of African markets with electrification rates below 50% decreased from 73% to 44%. Rwanda, Kenya, Togo, Ivory Coast and Zimbabwe have all more than doubled their electrification rates during this period. Still, 568 million people lack access to electricity in the African continent.

Source: BloombergNEF. Note: Mapped data are for distinct economies.

Low-income countries have more expensive electricity

Emerging markets average electricity price by income level



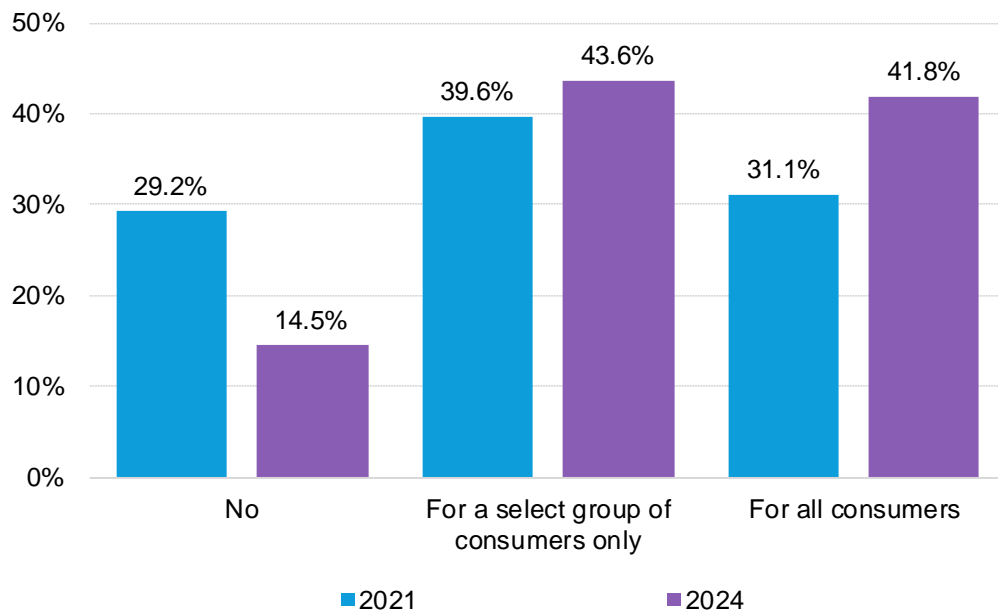
Electricity is pricier in markets where electrification rates are lower, which are generally low-income. Consumers in low-income markets face the highest costs for electricity, averaging \$154.4/MWh in 2023. The cause is two-fold. First, these markets lack mechanisms to ensure competitiveness, which can considerably lower power prices. Second, these markets have some of the most depreciated currencies of any emerging markets, which drives up price tags for imported electricity. That said, prices in low-income countries have been dropping for the past two years.

High-income markets saw the second-highest prices in 2023. Prices in these markets have been steadily rising since 2020, including the highest year-on-year change observed in the last 10 years for any income level, as Russia's invasion of Ukraine sparked an energy crisis in Europe and prices skyrocketed to \$137/MWh in 2022 from \$115/MWh in 2021.

Source: BloombergNEF. Note: Considers residential, commercial, industrial and wholesale prices by market and year. Excludes mainland China.

External factors are driving up power prices – and also subsidies

Share of emerging markets with power price subsidies in place



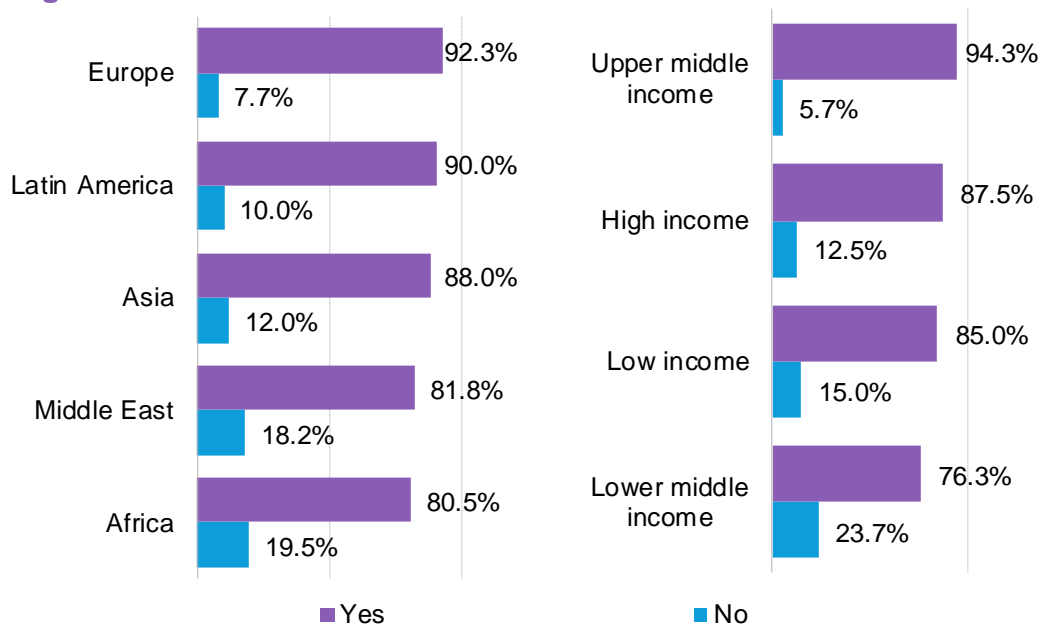
As geopolitical conflicts, pandemics and other external factors drive up power prices, a growing number of emerging markets are introducing subsidies to alleviate the burden on consumers. In 2021, 70% of emerging markets tracked by Climatescope had implemented some form of power price subsidy. These ranged from broad subsidies benefiting an entire population to more targeted measures aimed at supporting specific consumer groups, such as low-income households.

By 2024, that share has risen to 85%, and the scale of subsidies in emerging markets has expanded. These new subsidies have largely been targeted at specific lower-income segments of the population. This allows governments to manage costs while still addressing the population's electricity needs. However, as global energy prices remain volatile due to geopolitical tensions, environmental challenges and supply chain disruptions, the emerging markets' ability to maintain subsidies without economic compromise becomes increasingly precarious.

Source: BloombergNEF

The higher the income level, the more power price subsidies there are

Availability of power price subsidies in emerging markets, by region and income level



A larger share of Europe's emerging markets have power price subsidies than in any other region, primarily as a result of the energy crisis that gripped the continent after Russia invaded Ukraine. Africa has one of the smallest shares, although it has the highest concentration of low-income markets.

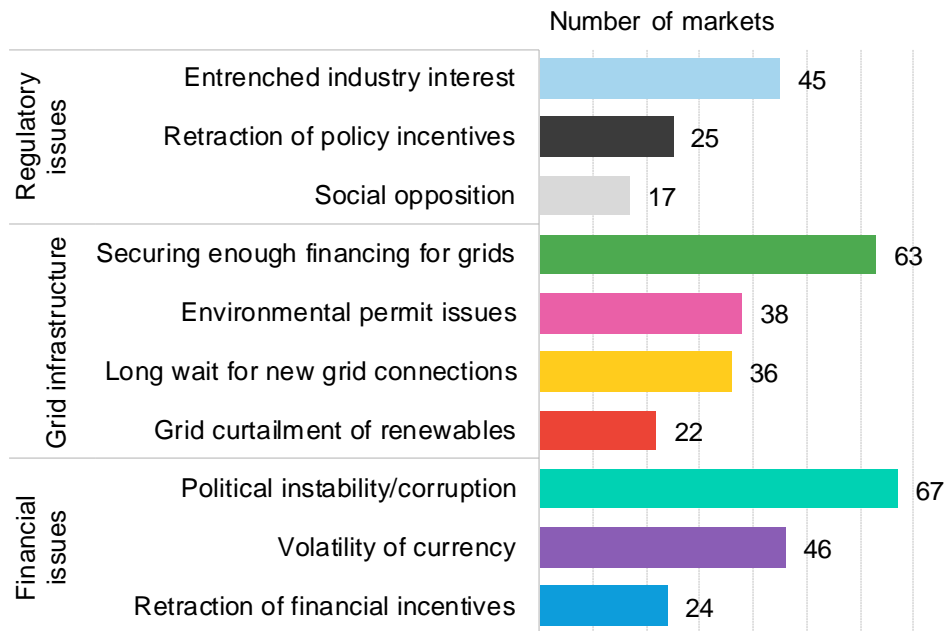
Markets in the low and lower-middle income brackets have the fewest power price subsidies, likely because they lack the financial capacity to implement and maintain large-scale subsidies over an extended period.

Introducing power price subsidies without proper planning can delay the transition to a cleaner economy, as it can create a false sense of affordability. In some cases, a rise in electricity prices has spurred the growth of small-scale renewable energy projects – and especially solar rooftop panels, as these leave consumers less reliant on volatile power prices from distributors.

Source: BloombergNEF

Investors and developers must navigate a complex landscape when pursuing clean energy projects

Energy transition barriers in emerging markets



Source: BloombergNEF

Grid constraints, regulatory hurdles and financial concerns are the major barriers for renewable energy investment in emerging markets. This year's findings, which are based on comprehensive interviews with local stakeholders and analysis of current news articles, indicate that financial barriers remain the most significant obstacle to progress. Financial instability is consistently cited as a top concern alongside political instability and corruption, which undermines investor confidence.

Securing financing for large-scale renewable projects is the second-most pressing issue. Global demand for clean energy is growing, but many emerging markets face difficulty in attracting sufficient capital due to their perceived riskiness. Currency volatility makes it particularly challenging for international investors to commit.

Entrenched industry interests also pose a barrier, as fossil-fuel producers often resist the shift to renewables. Grid curtailment does not yet represent a substantial barrier in most emerging markets as they are still in the early stages of integrating renewable energy at scale.



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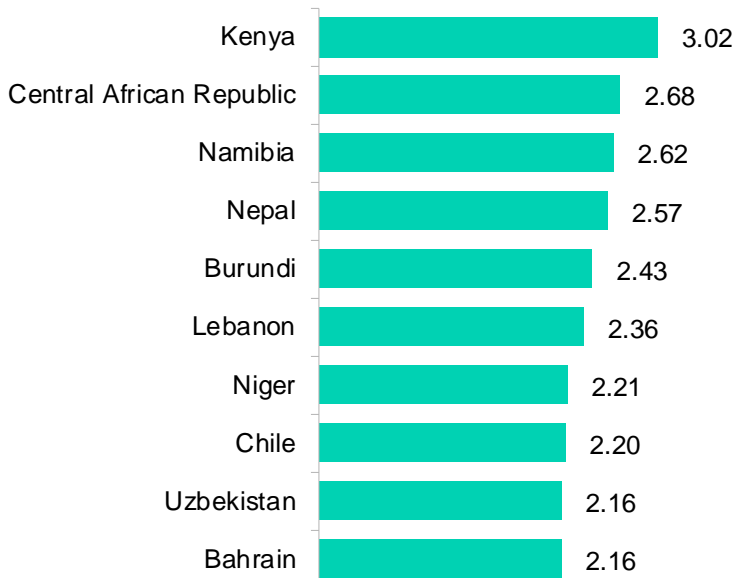
Experience

Renewable energy investment, capacity and generation

Experience measures a market's renewable energy history

Top 10 emerging markets for experience

Climatescope score



The experience parameter analyzes a market's own history in deploying and attracting investment. This parameter takes into account the level of clean energy capacity and generation, as well as the trends in investment over recent years. In particular, it focuses on the importance of offering lower risks, technology costs and costs of capital for developers.

The score rests on two key attributes: deployment and investment.

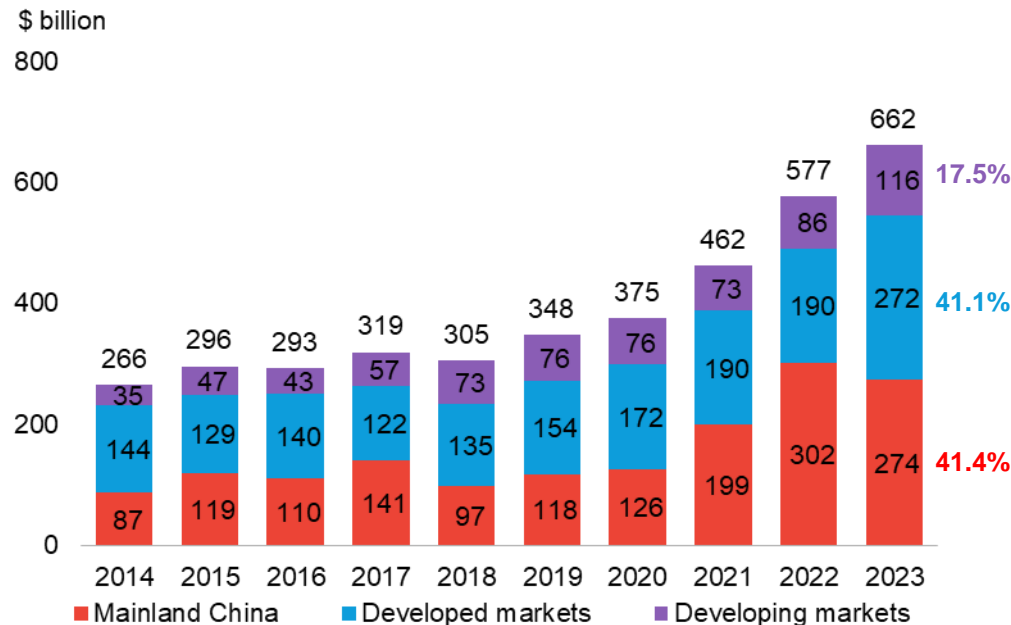
- **Deployment** accounts for both the capacity installed and the amount of electricity generated over the past five years, as well as the market's total clean energy capacity and generation.
- **Investment** considers renewable energy investment values over the past five years, including total investment, growth rates, and foreign participation in investment.

These act as a feedback loop, as the more a market deploys renewable energy, the more likely it is to attract investment, since it is clear that the market already has the policies, skilled labor and other factors necessary to support the development of renewables.

Source: BloombergNEF. Note: Maximum score is 5. For more details on which indicators are considered within this parameter, see the Methodology section at the end of this report.

Emerging markets accounted for 17.5% of renewables investment in 2023

New-build renewable energy investment, by trade category



Emerging markets (excluding mainland China) saw \$116 billion invested in renewable energy in 2023, up 35% from the year prior. This investment is directed to both the deployment of new renewable energy projects and the infrastructure needed to build them.

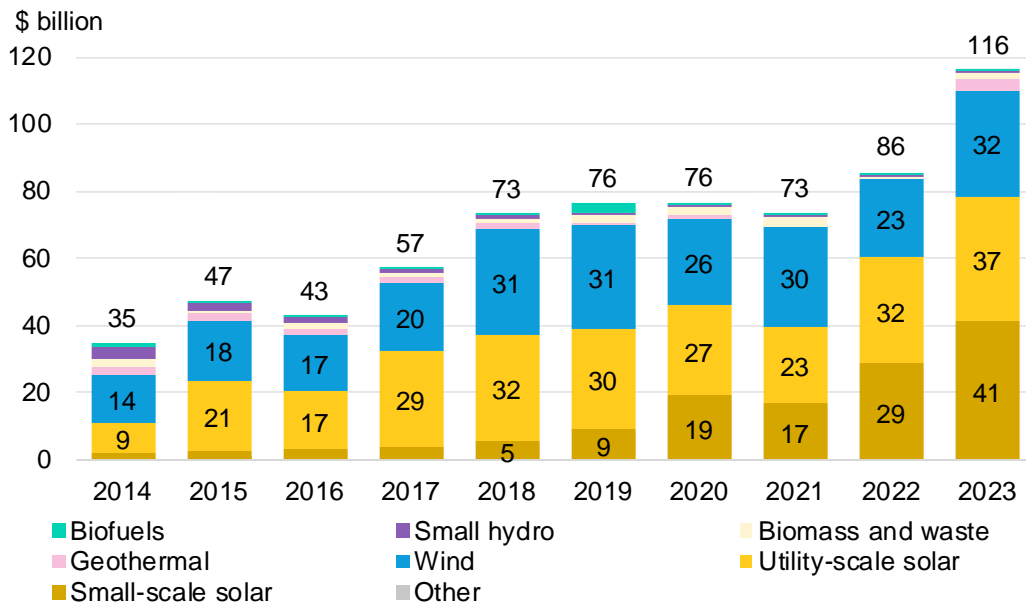
Passing the \$100 billion threshold for the first time, emerging markets received 17.5% of global investments in renewables in 2023, up from 13% in 2014. That's roughly in line with the trend of the last decade: these economies have seen 17% – or \$682 billion – of the world's renewable energy investment since 2014.

Despite this growing share, emerging markets (excluding mainland China) still lag far behind developed economies on the investment front. Mainland China is the heavy hitter in the group, with nearly 42% of the global total last year. Developed markets as a group accounted for 41.1%.

Source: BloombergNEF. Note: Data includes new-build asset finance and small-scale solar investment globally. BNEF's renewables data includes a global buffer for small-scale solar due to difficulties in tracking individual projects. In the chart, the buffer is included in the series for developed markets but not for developing markets due to the lack of a market breakdown.

Solar is driving investment growth in emerging markets

New-build renewable energy investment in emerging markets, by technology



Renewable energy investment in emerging markets hit an all-time high in 2023, largely thanks to solar investment reaching a record \$78 billion. Utility- and small-scale solar together accounted for 68% of renewable energy investment in emerging markets in 2023.

Small-scale solar has led that growth. With cheaper costs and higher dissemination rates, small-scale solar has been one of the top technology choices for many emerging markets.

Wind is growing, but it still has a long way to go in emerging markets. Wind investment jumped by more than a third year-on-year, but this investment is concentrated in a handful of markets. Taiwan, Brazil and India were responsible for over half the total investment in wind last year.

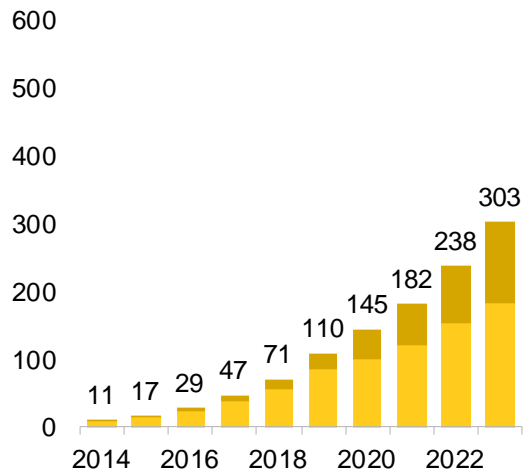
Source: BloombergNEF. Note: Data includes new-build asset finance and small-scale solar investment globally. Small hydro is up to 50 megawatts. BNEF's renewables data includes a global buffer for small-scale solar due to difficulties in tracking individual projects. Excludes mainland China.

Solar capacity keeps hitting records in emerging markets

Cumulative solar capacity, by scale and trade category

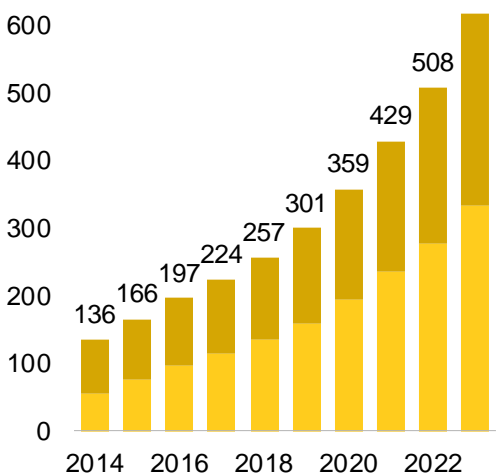
Emerging markets (excl. mainland China)

Gigawatts



Developed markets

Gigawatts



■ Small-scale solar installed capacity ■ Utility-scale solar installed capacity

In 2023, solar capacity in emerging markets reached over 300GW, which is almost half the total installed capacity in developed markets. This is especially relevant since emerging markets only had 11GW of solar capacity in 2014, a figure 10 times smaller than the installed solar capacity in developed markets in the same year.

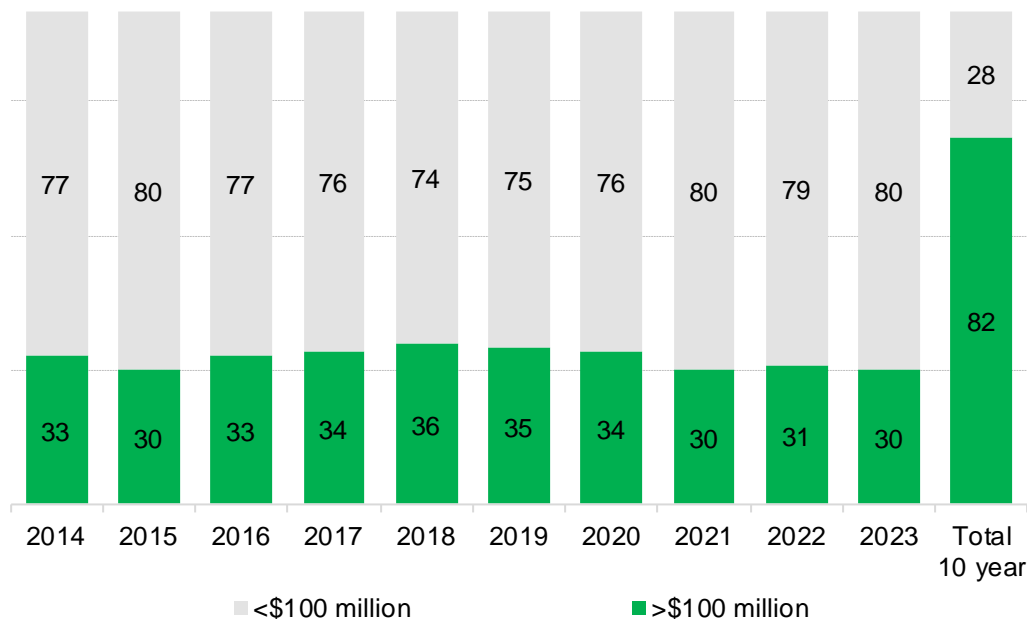
Small-scale solar is growing faster than utility-scale solar in emerging markets. Large, utility-scale plants can take longer to build and often face delays in developing economies, due to procedural and financial constraints. In addition, integrating these projects into the power grid can be complex. Small-scale solar can also face issues, but its decentralized nature means it can be installed by a range of stakeholders, which speeds up its adoption rate.

Solar has followed a different trajectory in developing markets. Over the last decade, utility-scale solar grew faster in these markets, but its growth rate gradually slowed down while small-scale's increased. In 2023, small-scale grew more in developed markets for the first time.

Source: BloombergNEF. Note: Excludes mainland China.

The number of markets attracting large investments for renewables has stayed steady for a decade

Number of emerging markets recording >\$100 million in renewable energy investment



Only 30 emerging markets out of the 110 analyzed attracted more than \$100 million in renewable investment in 2023. That figure is enough to finance just one large solar or wind project.

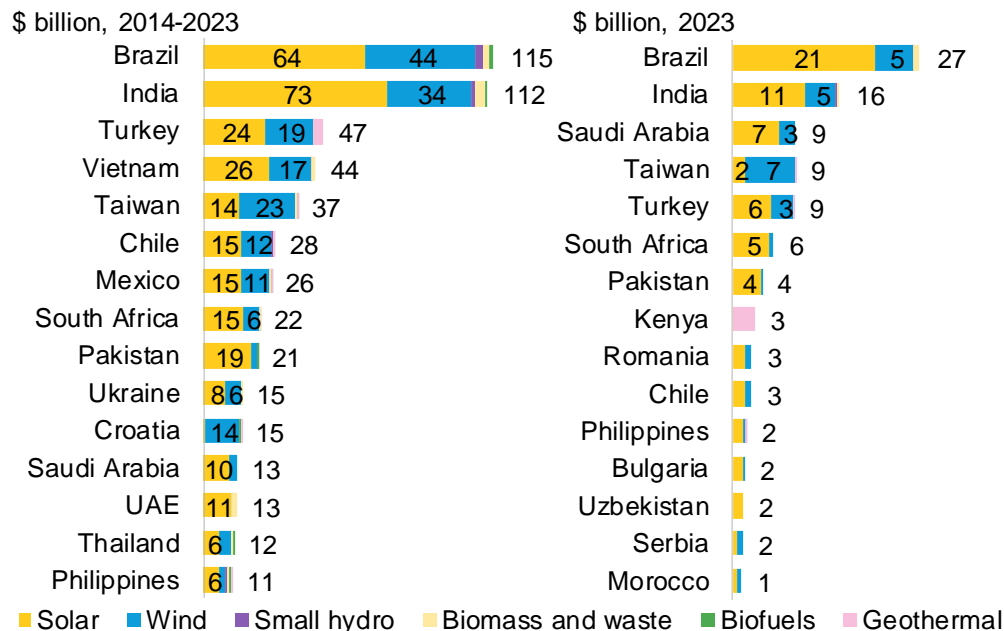
The financing is relatively spread out. Three-quarters of Climatescope's emerging markets have received more than \$100 million in investment during at least one of the past 10 years. Yet these are often largely one-off investments for standalone projects, and most renewables projects remain concentrated in a few key markets.

This shows the vastly unexplored potential and the barriers that currently limit deployment of low-carbon technologies in emerging markets, which still face financial, regulatory and infrastructure-related hurdles to deployment.

Source: BloombergNEF

A few emerging markets concentrate most investment

Top 15 emerging markets for renewable energy investment



Source: BloombergNEF. Note: Includes new-build asset finance and small-scale solar investment. Small hydro is up to 50 megawatts. Excludes mainland China.

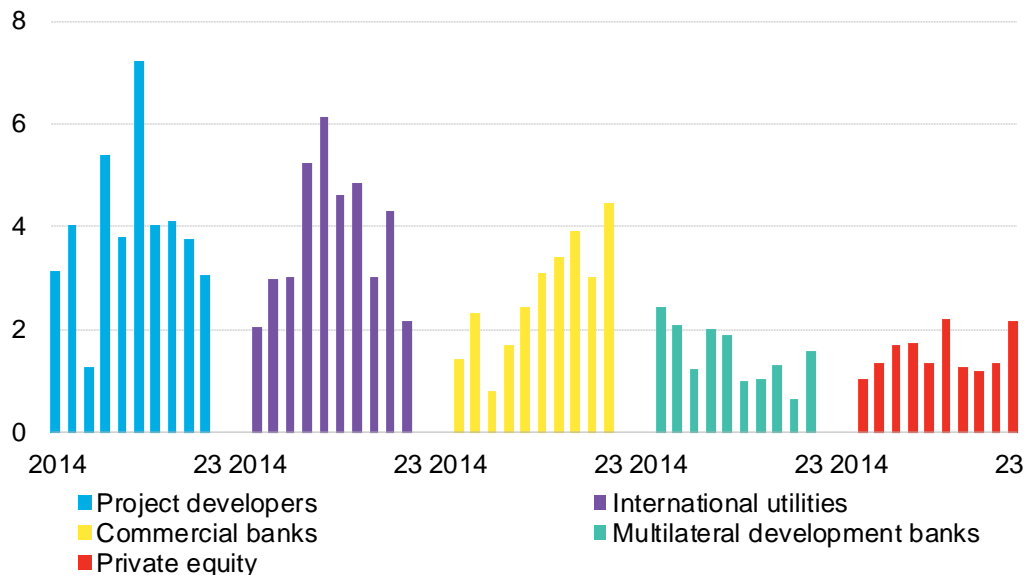
Renewable energy investment remains highly concentrated in a relatively small number of markets. Fifteen emerging markets concentrated 84% of new-build clean energy investment in 2023, or \$98 billion, whereas over the last 10 years, 15 markets accounted for 78% of all investment in emerging markets.

Brazil reached a record high for investment in 2023, attracting \$27 billion – or a fifth of the cumulative total it attracted over the last decade – in one year alone. Most investment over the last decade was concentrated in solar and wind, which attracted \$64 billion and \$44 billion, respectively, and both notched record levels of deployment. Brazil is blessed with the natural resources necessary for these technologies to function, but supportive policies such as auctions and net metering have helped them get off the ground.

Commercial banks lead emerging markets' foreign investment in 2023

Foreign investment in renewable energy in emerging markets, by investors

\$ billion



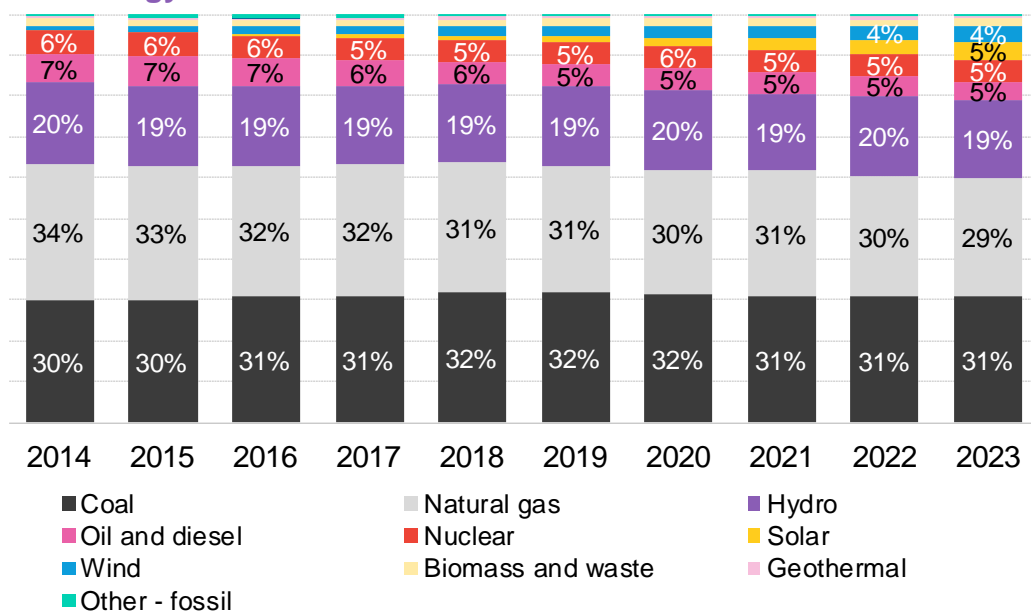
Source: BloombergNEF. Note: Excludes undisclosed data. Excludes mainland China.

Commercial banks were the largest foreign investors in emerging markets in 2023, accounting for some \$4 billion – or 15% of the total amount registered – that year. Project developers and utilities followed, with \$3 billion and \$2 billion, respectively.

This reflects a shift in investment trends. Over the last decade, project developers and international utilities were the biggest investors, pouring a total of \$86 billion, or 37% of the cumulative figure, into emerging markets from 2014 to 2023. With a cumulative \$25 billion, commercial banks were the third-largest investor group over the decade, while private equity reached \$19 billion. Multilateral development banks (MDBs) came in last, with \$15 billion.

A third of the power generated in emerging markets in 2023 came from zero-carbon technologies

Share of generation in emerging markets (excl. mainland China), by technology



Zero-carbon technologies made up almost 35% of the electricity generated in emerging markets (excluding mainland China) in 2023, up from 34% in 2022 and 29% in 2014. Hydro continues to be the single biggest source of zero-carbon generation, accounting for a fifth of total output in emerging markets. Solar tied nuclear for second place, with 5% each.

Solar and wind output in emerging markets more than doubled from 2017 to 2023. In 2023, solar accounted for 5% of the power generated in these markets, while wind accounted for nearly 4%.

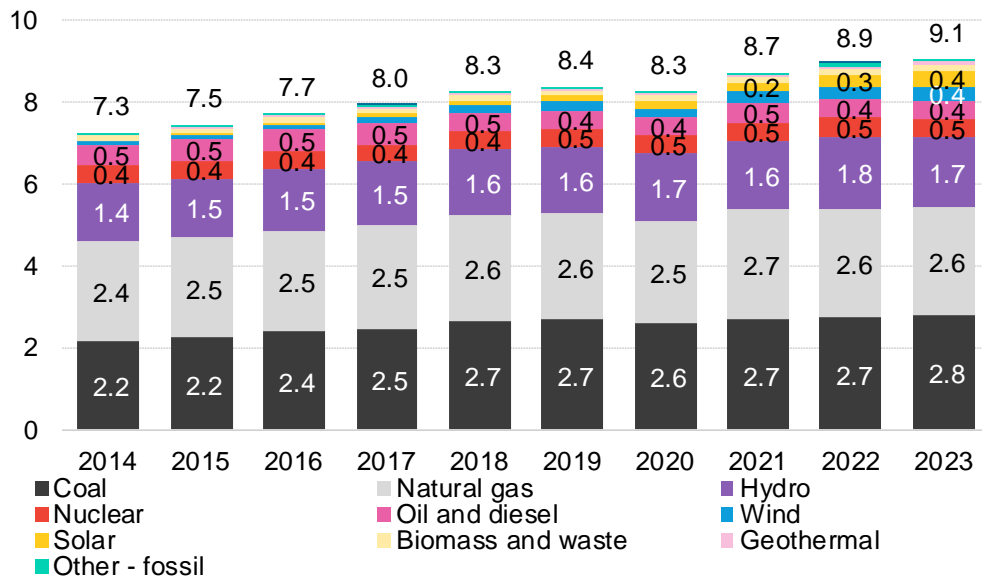
Coal replaced gas as the biggest fossil-fuel power-generating technology in 2018, although the two have been essentially tied since then. Gas has experienced the largest decrease in generation share of any technology over the past decade, from 34% in 2014 to 29% in 2023. Nonetheless, fossil fuels remain the largest source of generation in emerging markets, with 65%.

Source: BloombergNEF. Note: 'Other - fossil' accounts for plants that use more than one fuel or fuels other than coal, oil and gas. Zero-carbon technologies consist of renewable sources (solar, wind, geothermal, biomass and small hydro), large hydro and nuclear. Small hydro is up to 50 megawatts. Excludes mainland China.

Total generation in emerging markets surpassed 9,000TWh in 2023

Emerging markets annual generation (excl. mainland China), by technology

Thousand terawatt-hours



Source: BloombergNEF. 'Other - fossil' accounts for plants that use more than one fuel or fuels other than coal, oil and gas. Renewable includes wind, solar, biomass and waste, geothermal and hydro technologies. Excludes mainland China.

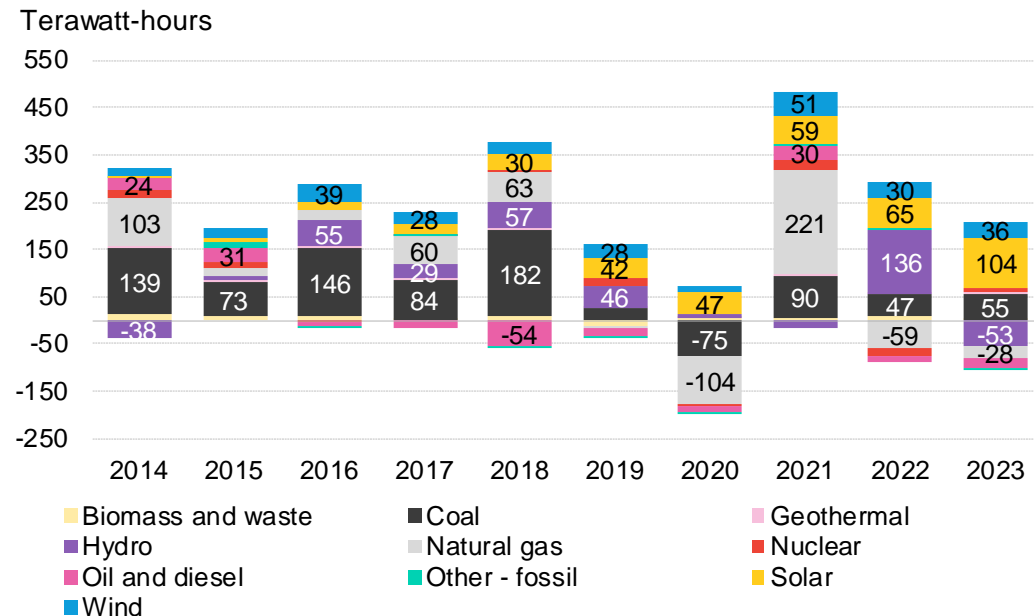
Electricity generation in emerging markets reached a record high of 9,051 terawatt-hours (TWh) last year. While this accounts for less than a third of global generation in 2023, it is nearly 25% higher than in 2014.

Renewable energy generation in emerging markets has come a long way since 2014, rising to 2,683TWh in 2023 from 1,687TWh. As a share of global generation, renewables now account for 28.5%, up from 21.9% in 2014. And renewable energy generation has seen an average year-on-year growth rate of 5%, while fossil fuels have expanded by just 1.5% per year.

Fossil fuels remains the main source of electricity generation in emerging markets, although their share of the mix has been slowly dropping. They accounted for 65% of generation in 2023, down from over 70% in 2014.

Hydro generation slumps as severe droughts affect the areas that rely on it the most

Year-on-year change in generation in emerging markets



Hydro experienced its most dramatic year-on-year drop in generation in at least a decade last year. There is precedent for hydro bouncing back from such dips: following severe droughts in 2021, hydro recovered well in 2022. Yet as climate change impacts rainfall patterns around the world, this technology is particularly vulnerable. This is even more pressing in markets that mostly rely on hydro generation, such as the Democratic Republic of Congo (DRC), Albania and Ethiopia.

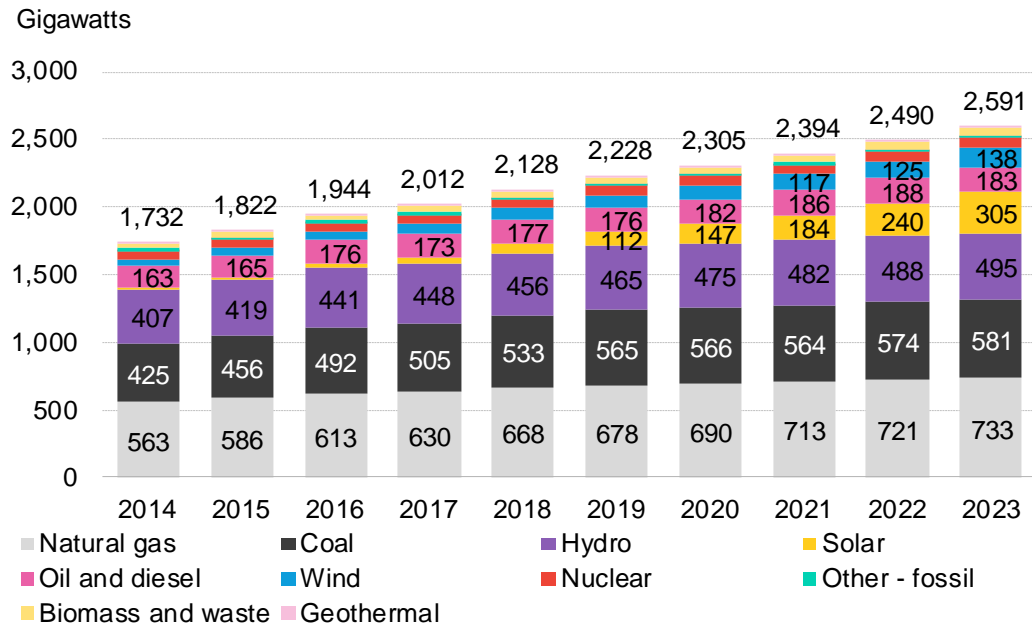
Solar generation, by contrast, has seen massive growth. Its 60% year-on-year growth spurt – to 104TWh in 2023 from 65TWh in 2022 – was the largest growth rate for any technology last year. India, Brazil, Vietnam, Mexico and Pakistan led this increase.

Gas generation has been on a roller coaster since 2018. It reached an all-time low in 2020 during the Covid-19 pandemic, followed by an all-time high in 2021. Since 2022, it has been dropping consistently, as Russia's war in Ukraine causes gas prices to spike.

Source: BloombergNEF. Note: Generation here refers to net generation change. 'Other - fossil' accounts for plants that use more than one fuel or fuels other than coal, oil and gas. Excludes mainland China.

Solar capacity in emerging markets surpassed 300GW in 2023

Installed capacity in emerging markets, by technology



Total power generating capacity in emerging markets (excluding mainland China) reached nearly 2.6TW in 2023, increasing 5% year-on-year. The cumulative installed capacity has nearly doubled over the last 10 years.

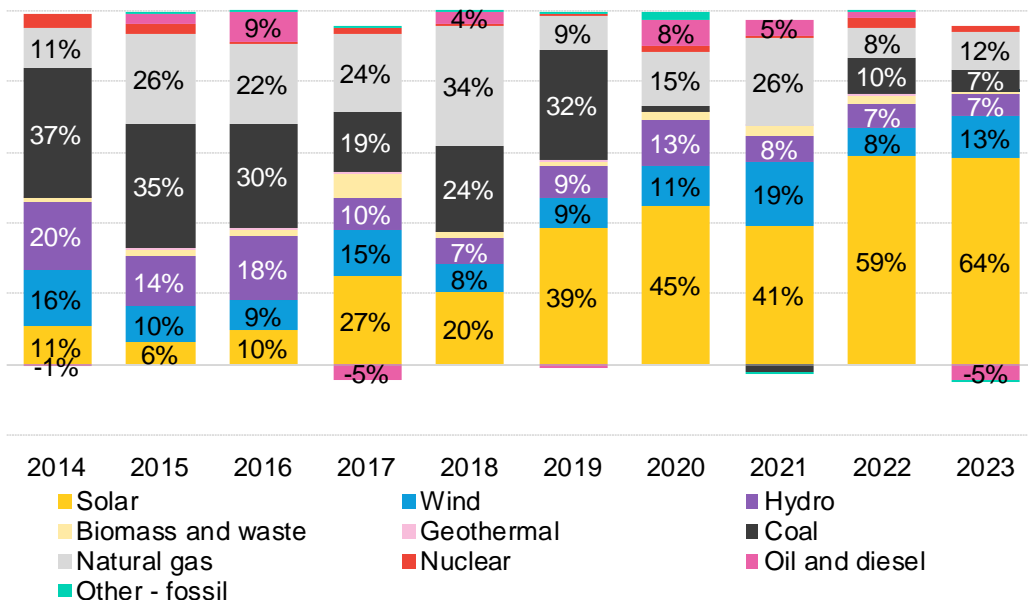
While hydro is still the most-installed clean power technology in emerging markets, its share in total capacity has decreased as solar and wind gain ground. Solar and wind now represent a combined 17% of capacity in these markets, up from just 2% in 2014. Hydro, meanwhile, has dropped to 19% from 24% over the past decade.

Natural gas still represents a considerable 28.3% share of the total installed capacity in emerging markets, but its capacity grew by just 1.6% between 2022 and 2023. Coal grew a mere 1.2% over the same period, while solar and wind together grew almost 19%.

Source: BloombergNEF. 'Other - fossil' accounts for plants that use more than one fuel or fuels other than coal, oil and gas. Renewable includes wind, solar, biomass and waste, geothermal and hydro technologies. Excludes mainland China.

Solar and wind represented over three-quarters of capacity additions in emerging markets in 2023

Share of capacity additions by technology in emerging markets (excl. mainland China)



Solar and wind accounted for 77% of the 100GW of generating capacity added in emerging markets (excluding mainland China) in 2023. Solar alone accounted for 64% of new build, while wind represented 13%. Solar additions jumped 27% year-on-year, while wind additions rose 10%.

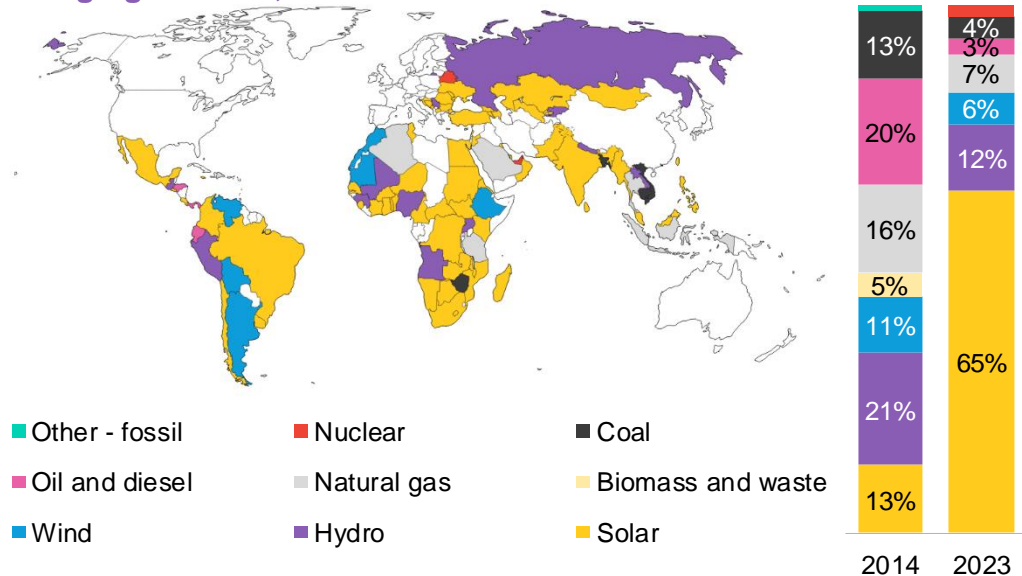
Zero-carbon technologies represented 86% of total capacity added in 2023. Hydro joined solar and wind on the zero-carbon podium but was a distant third at just 7GW added in emerging markets.

Coal capacity additions have decreased significantly, to only 7% in 2023 from 37% in 2014. Even though coal experienced a minor increase in 2022 and 2023, it lost its place as one of the technologies with the most capacity additions, as renewables are now taking over.

Source: BloombergNEF. Note: Total net additions to global capacity. 'Other - fossil' accounts for plants that use more than one fuel or fuels other than coal, oil and gas. Net capacity additions based on the change in the installed base year-on-year by technology, inclusive of retirements and gross additions. Excludes mainland China.

Solar is the most popular kid on the clean-power block

Most popular new power generating technology installed in emerging markets, 2023



Renewables are beating out fossil fuels in emerging markets. In 2023, renewable energy (including hydro) was the first choice in 83% of the world's emerging economies, a significant increase from 50% in 2014.

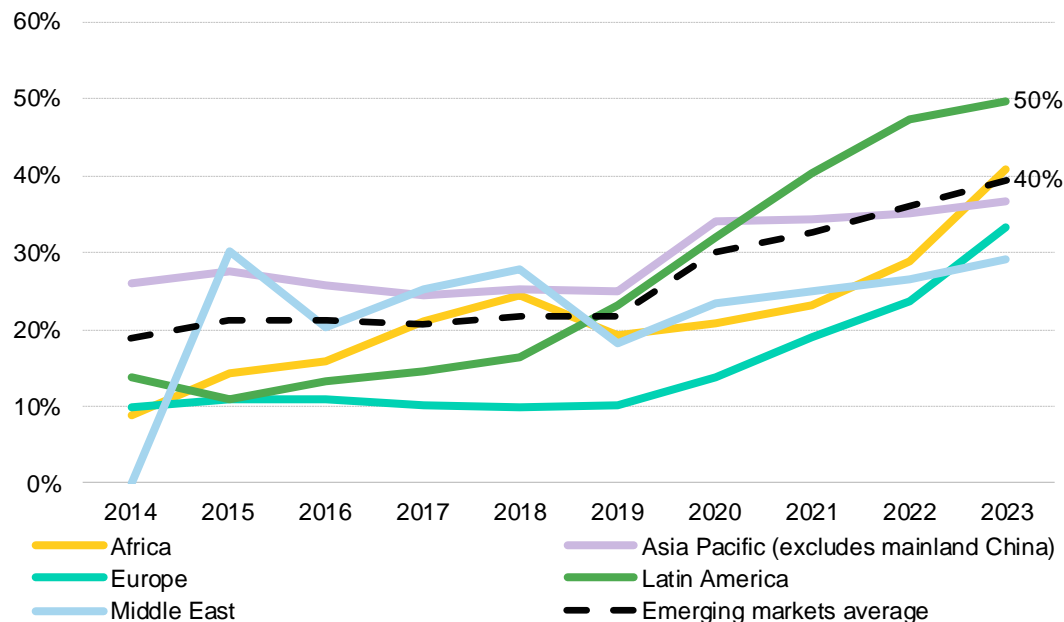
Thanks to a continuous decrease in solar costs over the last decade and policies that have driven deployment, solar is now the most-added technology in the world's emerging markets – and by far. Two-thirds of markets last year had solar as their top technology, while just 12% preferred second-place hydro, which slipped from 21% a decade ago. Wind also saw a significant drop from 11% to 6% over the same time period, as projects face permitting challenges and commissioning delays.

In 2023, only 17% of the world's emerging economies added more fossil fuels than renewables, compared with 49% in 2014.

Source: BloombergNEF. Note: Map colored by which technology was the most installed in 2023. Excludes mainland China. Bar chart shows the share of markets that installed the most megawatts of each technology. Bar chart is based on market-level data for 109 markets, but excludes markets that have not recorded any capacity additions. Solar includes utility and small-scale solar. Mapped data are for distinct economies.

Small-scale solar makes up 40% of installed solar capacity in emerging markets

Emerging markets share of small-scale solar in total solar capacity by region



Source: BloombergNEF. Note: Excludes mainland China.

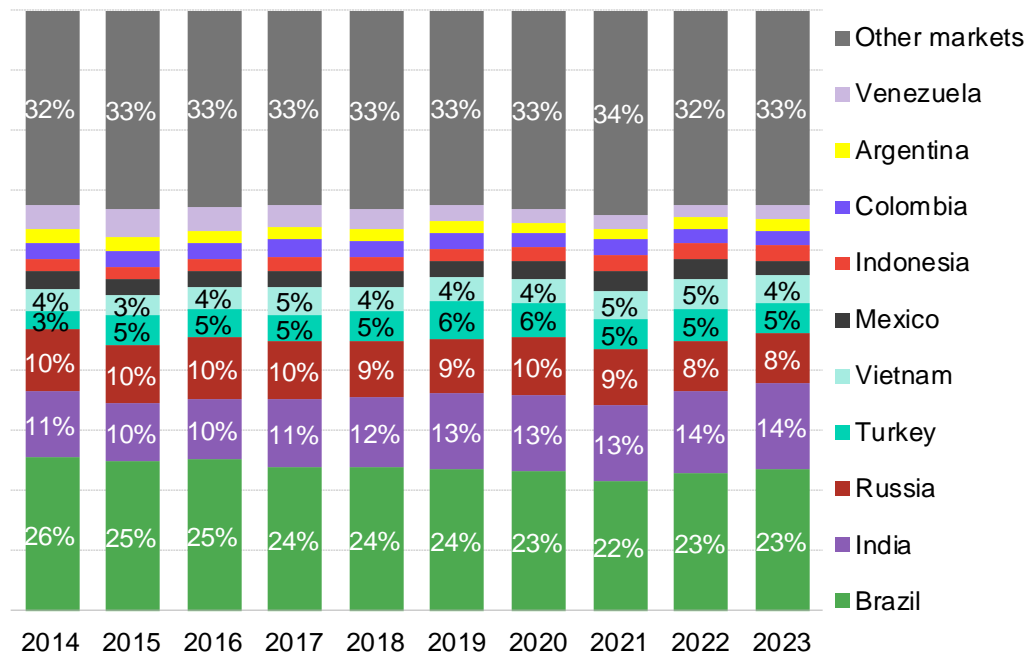
In 2023, small-scale arrays accounted for 40% of the solar capacity installed in emerging markets. That's up from 20% in 2014, which represents an average year-on-year growth rate of 33%.

Most solar capacity in Latin America is concentrated in Brazil. The massive market accounts for 87% of the region's small-scale capacity and over two-thirds of its utility-scale capacity. If Brazil were removed from this analysis, small-scale solar would only represent 16% of Latin America's solar capacity. The success of small-scale solar in Brazil is largely thanks to the net-metering policy implemented in 2012.

Africa, Europe and the Middle East experienced five-year average growth rates of over 60% for small-scale solar capacity. Meanwhile, Asia Pacific experienced the lowest average growth rate among all regions, at 39%. This region has faced challenges in implementing robust net-metering policies that could increase the attractiveness of small-scale solar.

Brazil leads renewable generation in emerging markets

Top 10 emerging markets' share of total renewable generation



Ten economies accounted for almost 70% of all renewable energy generation in emerging markets (excluding mainland China) in 2023.

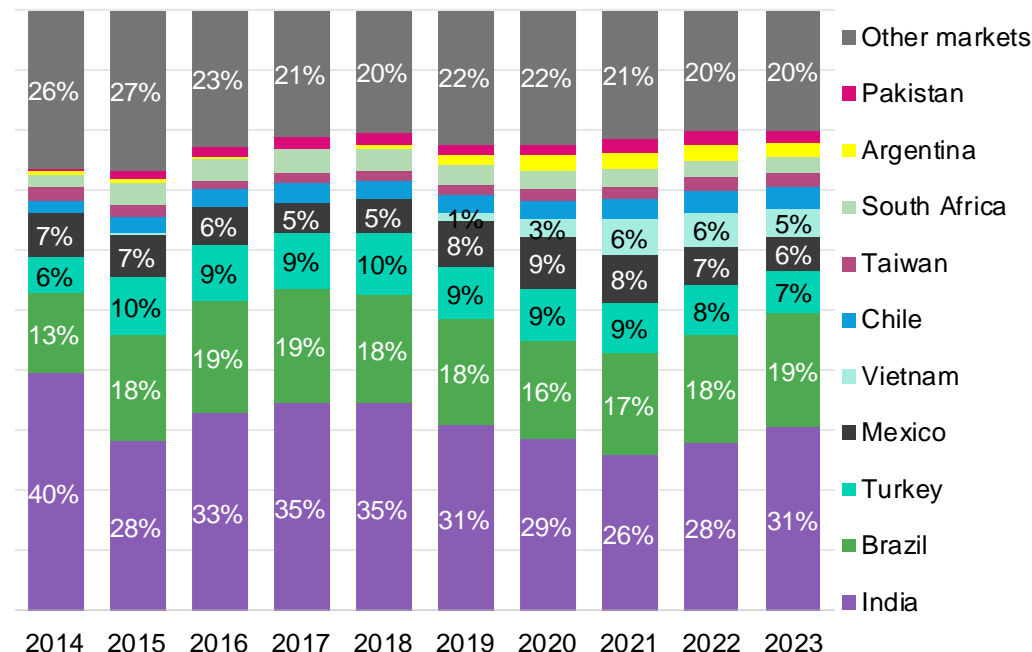
Brazil alone accounted for almost a quarter of the total. The market has robust hydropower resources, significant solar irradiation and extremely high-capacity factors for wind. Combined with effective policies and incentives, these have created a prosperous environment for renewable energy projects. India remains a distant second, but as its share grows, Brazil's has dipped.

Russia, Turkey and Vietnam rounded out the top five. Together, these five markets accounted for 54% of the renewable generation in emerging markets (excluding mainland China) last year. But that doesn't mean all of them saw renewable output rise year-on-year: while Russia experienced 3.4% year-on-year growth, Turkey remained flat and Vietnam saw its renewable generation fall by 10% in 2023, mainly due to a 24% drop in its large hydro output.

Source: BloombergNEF. Note: Renewable includes biomass and waste, geothermal, solar, wind, large and small hydro. Small hydro is up to 50 megawatts. Excludes mainland China.

Ten economies represented 80% of solar and wind energy generation in emerging markets in 2023

Top 10 emerging markets for solar and wind generation



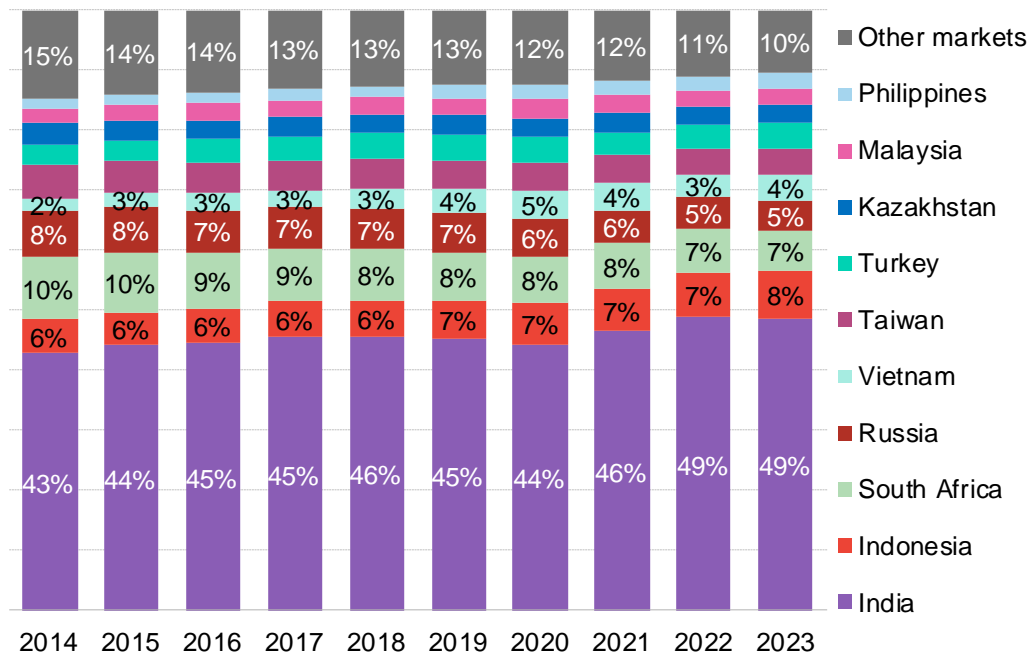
Ten economies accounted for almost 80% of solar and wind energy generation in emerging markets (excluding mainland China) in 2023. India stood head and shoulders over its next-nearest competitor, Brazil, representing nearly one-third of all solar and wind output in emerging markets last year. Brazil came in second, accounting for 19% of emerging markets' total wind and solar generation in 2023. Together, these markets have accounted for half of all solar and wind generation in emerging markets for most of the last decade.

Turkey, Mexico and Vietnam rounded out the top five, together accounting for more than two-thirds of emerging markets' solar and wind generation last year. While Turkey and Mexico have been among the top five for the past decade, Vietnam only made the cut in 2021.

Source: BloombergNEF. Note: Solar includes solar thermal. Excludes mainland China.

India accounts for almost half of all coal generation in emerging markets

Top 10 emerging markets for coal generation



Source: BloombergNEF. Note: Excludes mainland China.

Ten economies concentrated 90% of the coal-generated power produced in emerging markets (excluding mainland China) in 2023, but India alone accounted for 49%. Indonesia and South Africa complete the top three, accounting for 8% and 7% of the emerging markets' total, respectively.

While India was the largest contributor to coal generation in emerging markets in the last decade, it was also the largest contributor to solar and wind generation over the same period. On average, India has been responsible for 31.6% of the solar and wind generation in all emerging markets since 2014, which shows an inherent contradiction in the market's energy matrix: although it generates considerable amounts of clean energy, the market is still largely dependent on fossil fuel.

All emerging markets in the top 10 except for South Africa, Russia and Turkey are in the Asia Pacific region. While some of these markets have been making strides in the energy transition, they still concentrate some of the biggest coal reserves among emerging markets.



07. Methodology

Climatescope ranking methodology (1)

Market score combinations

Combinations	1	2	3	4
On-grid	1	1	-	-
Off-grid	-	-	1	1
Flexibility	-	1	-	1
Non-flexibility	1	-	1	-
No. of markets	52	14	39	5

Emerging markets vary in structure, which can make it hard to craft an apples-to-apples comparison for their attractiveness to investors. Climatescope thus uses **score combinations** to group markets by both grid framework maturity and the flexibility of their energy systems. In particular, Climatescope categorizes markets according to:

- Grid status: A market is considered on-grid if national electrification rates exceed 90% and off-grid if lower than 90%.
- Flexibility: A market is considered flexible if the share of solar and wind capacity in the most recent year for which data is available is greater than 20%, and non-flexible if the share is lower than 20%.

Source: BloombergNEF

Climatescope ranking methodology (2)

Parameter weight distribution, by market combination

Parameter	Share	Category	1	2	3	4
Fundamentals	50%	Policy	50%	40%	40%	40%
		Power sector	30%	40%	40%	40%
		Barriers and incentives	15%			
		Currency variation	5%			
Opportunities	25%	Prices and costs	20%	20%	15%	15%
		Renewables procurement	25%	25%	18.8%	18.8%
		Decentralized energy incentives	0%	0%	11.3%	11.3%
		Carbon Intensity	15%			
		Market size	30%			
		Corporate commitments	5%			
		GDP growth	5%			
Experience	25%	Finance	40%			
		System	60%			

A market's Climatescope power score is distributed between three differently weighted parameters: fundamentals (50%), opportunities (25%), and experience (25%). Fundamentals carries the biggest weight, as a market must first provide an enabling environment to set a precedent for investment attractiveness; opportunities and experience can then follow.

The distribution of different market combinations allows for a more effective assessment, categorized as per the table to the left. Each category includes standardized indicators applied across all markets. This approach allows for a more granular distribution of scores within each category, by identifying the most critical factors in different combinations for a comprehensive market assessment.

Source: BloombergNEF

Climatescope project market coverage

Regions	Trade bloc	Markets
Africa	Developing markets	Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Ghana, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, South Sudan*, Sudan*, Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe
Asia Pacific	Emerging markets	Armenia, Azerbaijan, Bangladesh, Cambodia, Georgia, India, Indonesia, Kazakhstan, Kyrgyzstan, Laos, Mainland China, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Tajikistan, Thailand, Turkmenistan, Uzbekistan, Vietnam
Asia Pacific	Developed markets	Australia, Japan, New Zealand, South Korea
Latin America	Emerging markets	Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela
Europe	Emerging markets	Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Moldova, Montenegro, North Macedonia, Romania, Russia*, Serbia, Turkey, Ukraine*
Europe	Developed markets	Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the UK
Middle East	Emerging markets	Bahrain, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine*, Qatar, Saudi Arabia, UAE
Middle East	Developed markets	Israel*
Americas	Developed markets	Canada and the US

Source: BloombergNEF. Note: (*) These markets are not included in the Climatescope 2024 ranking as conflicts and sanctions have limited data availability.

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