Brazil Transition Factbook 2025

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Introduction

Context

As geopolitics and extreme weather events spark uncertainty around the world, the energy transition continues to present economic opportunities for investors, governments and individuals alike.

As the host of COP30, Brazil has a chance to help shape the global climate agenda – while also highlighting the progress it is making on its own net-zero pathway.

The 2025 edition of the Brazil Transition Factbook, produced by BloombergNEF and commissioned by Bloomberg Philanthropies, aims to support policy, business and investment professionals by making available key data about the country's energy transition, as well as the trends, challenges and opportunities that are shaping it.

Executive summary

Brazil's net-zero transformation presents a $6 trillion opportunity through 2050.

The country has the cleanest **electricity generation** among the Group of 20 countries. It has seen a significant increase in wind and solar generation in the past few years, and energy storage is expected to take off soon. However, Brazil's primary energy demand still relies significantly on fossil fuels.

Electric vehicles are gaining traction on Brazilian roads. EV sales hit six figures last year and Chinese automakers are planning to set up factories in Brazil. **Sustainable aviation fuel** targets now cover 45% of global jet fuel demand, and Brazil's biofuels industry could play a role in supplying SAF – although competition may be fierce.

Brazil is one of the world's top sources of **energy transition metals**, and its **biomass** reserves could help build out the country's green-steel industry as **clean hydrogen** developers grapple with high costs and low demand. On the **sustainable finance** front, Brazil's national sustainable taxonomy is expected to be finalized later this year.

Brazil stands at the nexus of domestic and global **carbon markets**, hosting COP30 – where attendees will try to finalize a worldwide market – just as its own offsets market gets off the ground. And with one of the most diverse and valuable ecosystems in the world, Brazil can also lead the way in **sustainable agriculture**. The country's corporate regenerative agriculture market is already the second-largest globally, and Brazil possesses the largest potential for nature-based solutions in the world.

Content

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Energy scenarios

Energy scenarios

Clean power

Decarbonizing transport

Decarbonizing industry

Energy transition metals

Sustainable finance

Agriculture and biodiversity

Carbon markets

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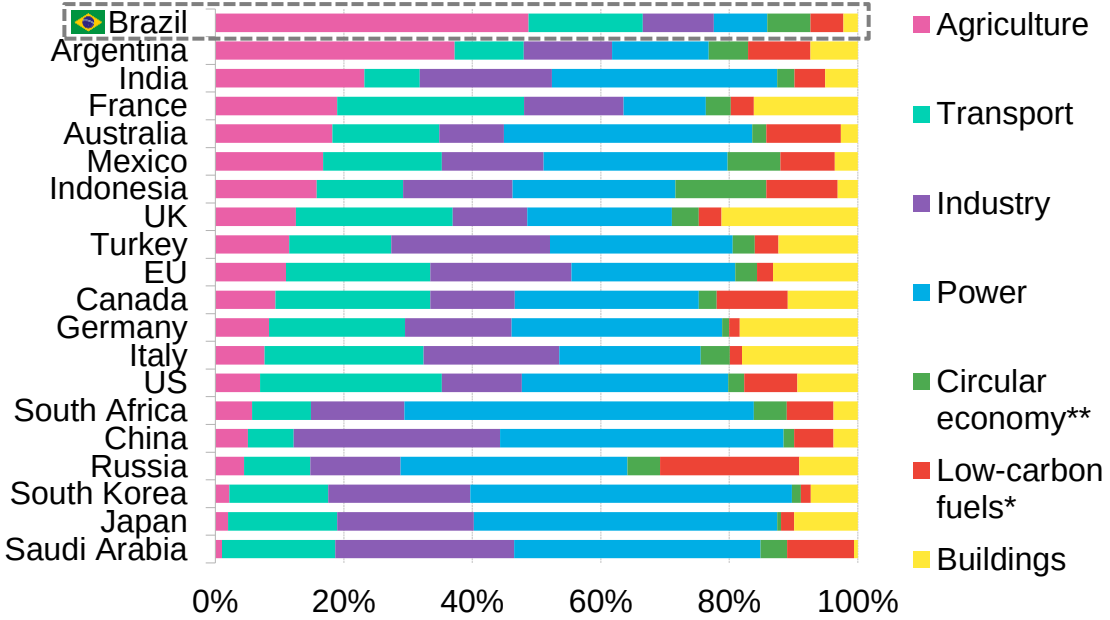
The energy sector accounts for only half of Brazil's emissions, but offers big opportunities for reduction

G-20 members' greenhouse gas emissions



Each country's decarbonization story has a unique plot, but Brazil's is particularly distinctive.

For most markets, the power sector is the main source of emissions. But the story is different in Brazil. Excluding land use, land-use change and forestry, the agriculture sector alone accounts for half of the country's total emissions, followed by transport at 18%, industry at 11% and finally power at 8%.

BNEF's scenarios focus on all energy-related emissions, which is the other half of the story.

*Source: BloombergNEF, World Resources Institute Climate Watch, European Environment Agency. Note: Data is from 2020 and excludes land use, land-use change and forestry (LULUCF). *Represents fugitive emissions and other fuel combustion. **From waste sector.*

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BNEF modeled two scenarios for Brazil's energy transition to a low-carbon economy

Economic Transition Scenario (ETS)

- Exploratory base case that describes how the power, industry, transport and buildings sectors might evolve as a result of cost-based technology changes.
- Consistent with a 2.6C warming by 2100 outcome.
- Assumes no further policy support for the energy transition beyond existing measures.
- Assumes the low-carbon transition is largely limited to the power and transport sectors.

Net Zero Scenario (NZS)

- Normative climate scenario that describes a tough but achievable stretch to get on track for net-zero emissions by 2050 by meeting sectoral carbon budgets.
- Consistent with a 1.75C warming by 2100 outcome.
- No overshoot or reliance on net-negative emissions after 2050.
- Fully decarbonizes power, transport, industry and buildings by 2050.

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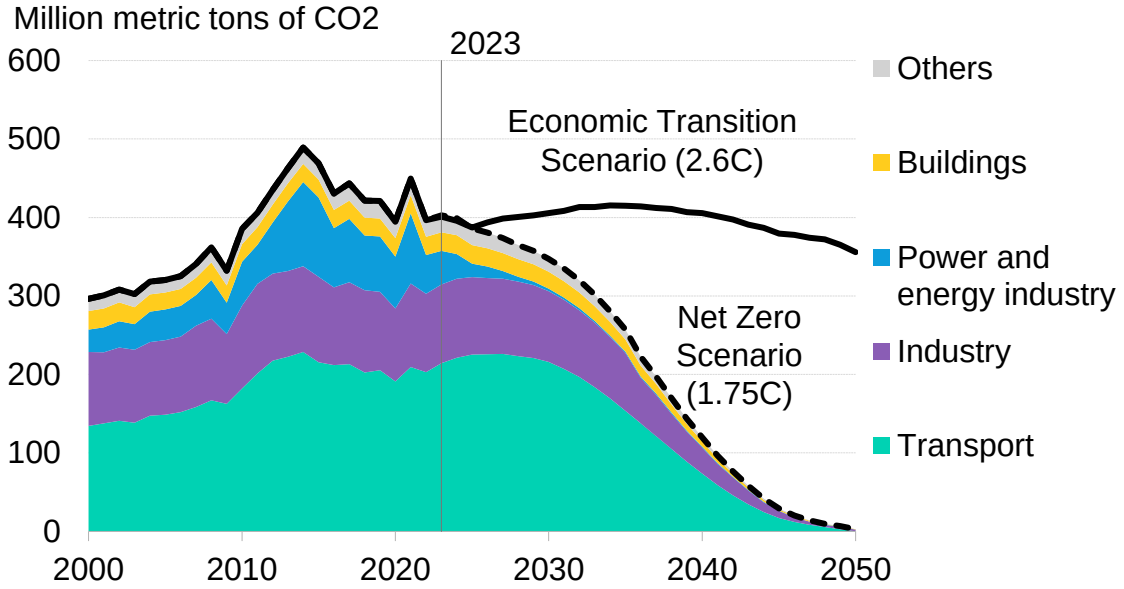
Brazil's energy-related emissions need to drop 70% by 2040 to reach net zero

Brazil energy-related emissions and net-zero carbon budget



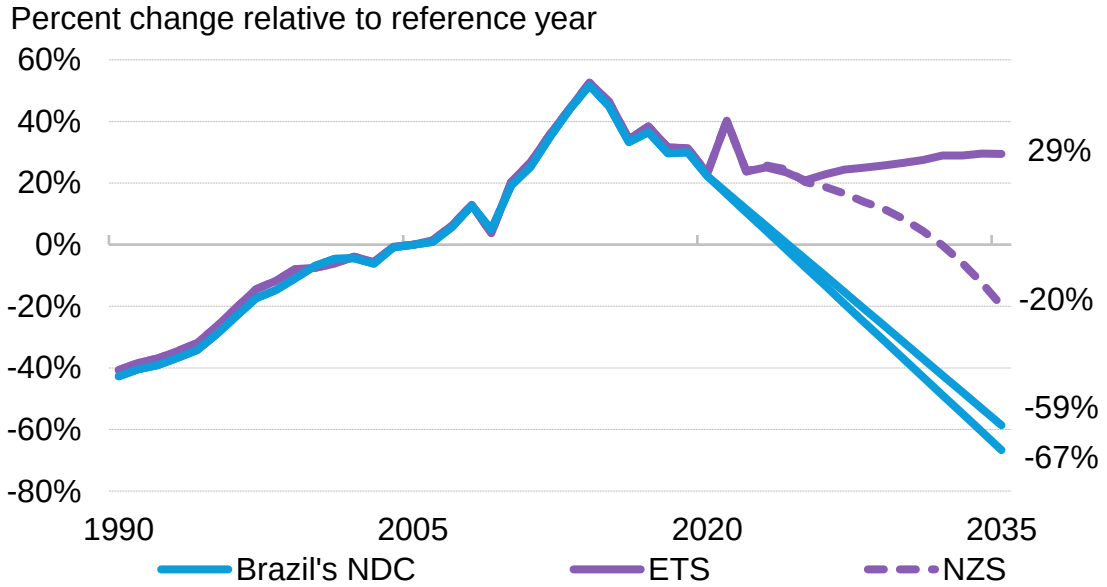
Brazil's energy-related emissions need to fall 14% by 2030 from 2023 levels – and drop 70% by 2040 – to be aligned with BloombergNEF's Net Zero Scenario (NZS). In contrast, emissions in BNEF's Economic Transition Scenario (ETS) for Brazil continue to rise until the mid-2030s.

Brazil is an outlier among Group of 20 (G-20) members, as its power sector is already largely decarbonized. However, half of the country's final energy consumption remains reliant on fossil fuels. The transport sector alone is responsible for 53% of Brazil's energy-sector emissions.

Source: BloombergNEF. Note: 'Transport' includes emissions from aviation, rail, shipping and road. 'Industry' includes aluminum, chemicals, cement, steel and other industrial sectors. 'Power and energy industry' includes power, hydrogen and energy industry. 'Buildings' includes commercial and residential buildings. 'Others' includes non-energy uses.

Brazil's new NDC is even more ambitious than emissions cuts under BNEF's Net Zero Scenario

Brazil's NDCs versus BNEF's scenarios, 1990-2035



Brazil has set an economy-wide target of reducing net greenhouse gas emissions to 59-67% below 2005 levels by 2035. The country is still committed to net zero by 2050.

Assuming a same-effort reduction across all greenhouse-gas-emitting sectors, this target is more ambitious than BNEF's Net Zero Scenario. Achieving this NDC target will require economy-wide reductions in emissions, but the largest decrease will need to happen in agriculture, land use, land-use change and forestry.

Source: BloombergNEF, greenhouse gas data from World Resources Institute CAIT. Nationally Determined Contribution (NDC) from UN Framework Convention on Climate Change.
Note: ETS is Economic Transition Scenario; NZS is Net Zero Scenario. Brazil's NDC is economy-wide, while BNEF's scenarios are energy-related only. BNEF assumes a same-effort reduction across all greenhouse-gas emitting sectors. Data has been normalized for reference year 2005.

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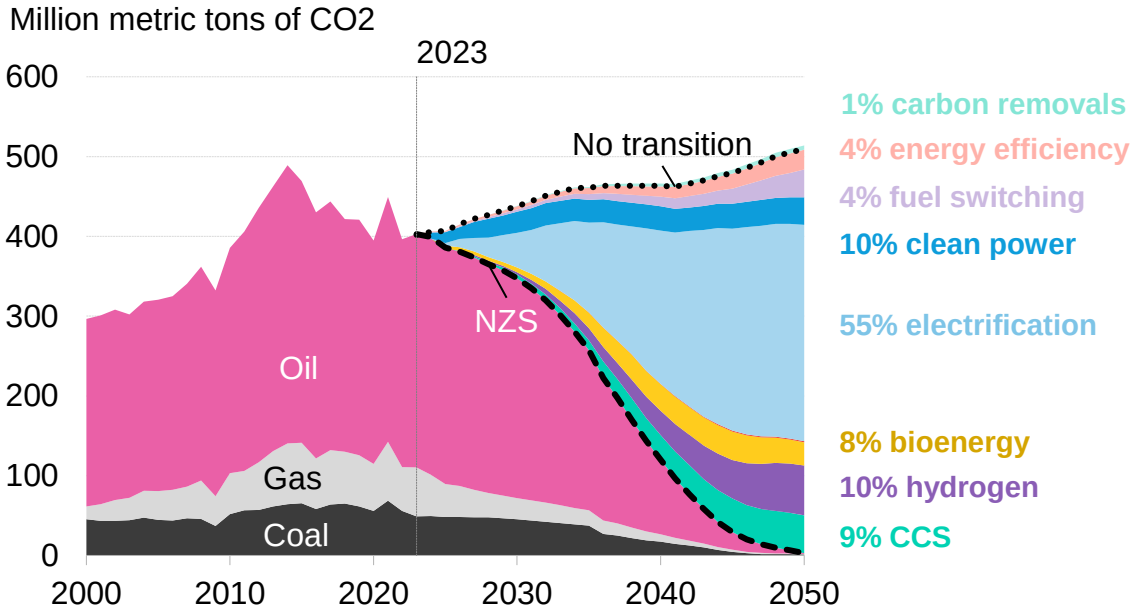
Electrification must be the main decarbonization driver of Brazil's energy transition

Abatement of CO2 emissions from fuel combustion in Brazil, by type/technology



Brazil will require many different pathways to decarbonize the country's energy-related emissions. One of the most important areas is the electrification of end-use sectors, including road transport, buildings and industry.

An economics-driven base case would not include extensive deployment of technologies such as carbon capture and storage (CCS), hydrogen and bioenergy, although these three technologies together account for 27% of emission reductions under BNEF's Net Zero Scenario.

Source: BloombergNEF. Note: The 'no transition' scenario is a hypothetical counterfactual that models no further improvement in decarbonization and energy efficiency. 'Clean power' here includes renewables and nuclear. Energy efficiency includes demand-side efficiency gains and more recycling in industry. CCS is carbon capture and storage.

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Net zero in Brazil requires both mature and new technologies to succeed

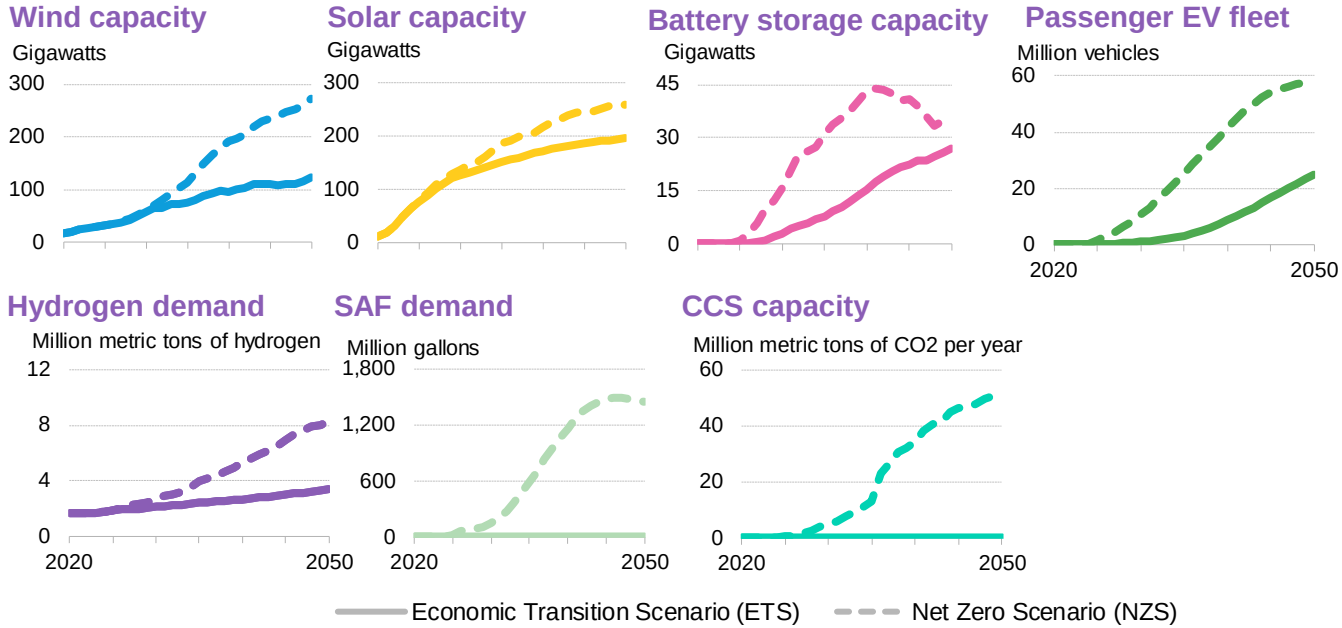
Selected technology drivers in BNEF's Brazil scenario modeling

Mature and scalable technologies

Proven business models and already-strong uptake in the ETS; significant growth needed to align with the NZS.

Nascent and new technologies

Not currently cost-competitive, resulting in little uptake in the ETS; must scale rapidly to align with the NZS.



Source: BloombergNEF. Note: Wind includes offshore and onshore. Solar includes small-scale and utility-scale photovoltaics (PV). Battery storage includes stationary storage. SAF is sustainable aviation fuels; CCS is carbon capture and storage. The ETS shows the current project pipeline. Nuclear capacity and heat pumps were disregarded for their scale in Brazil.

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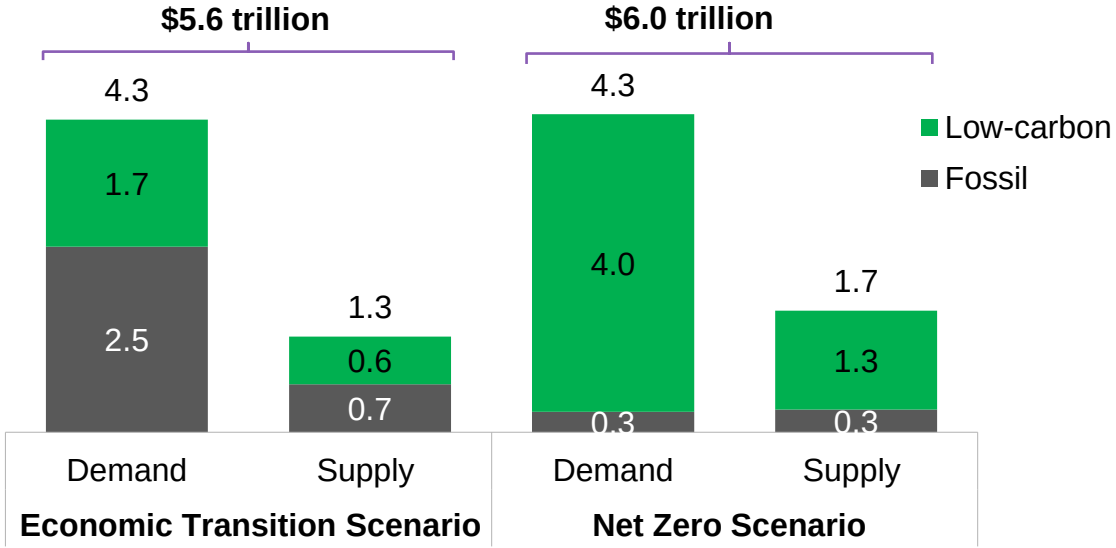
Net zero in Brazil presents a $6 trillion opportunity by 2050

Brazil's energy investment and spending, 2024-2050

$ trillion (real 2023)



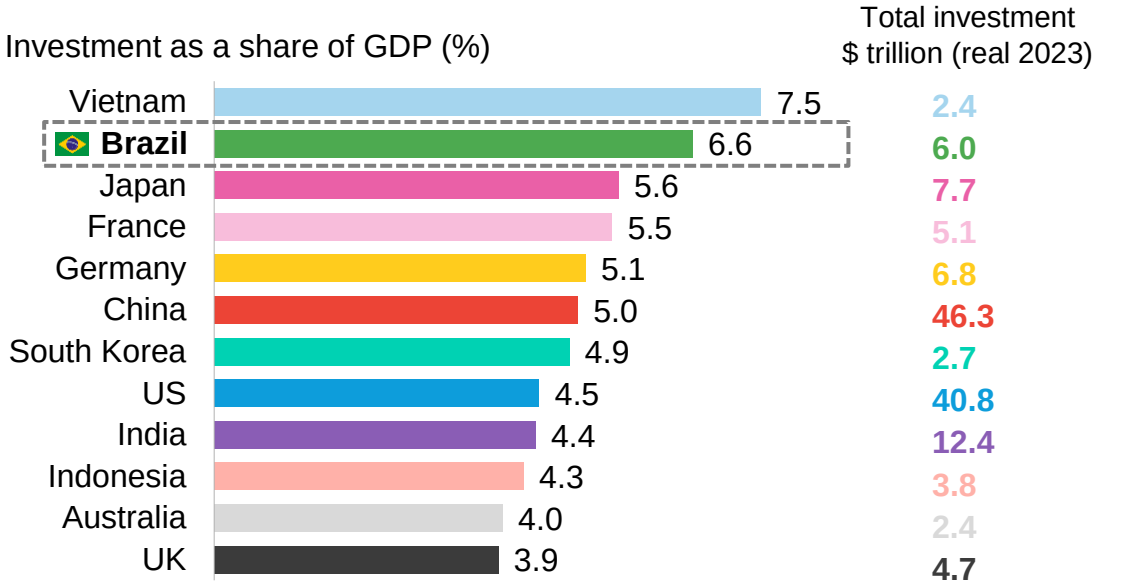
The Net Zero Scenario in Brazil requires only 8% more investment than the economics-driven base case.

It may soon be cheaper for Brazil to transition to a net-zero economy than not to: The cost estimates presented in these scenarios only cover the capex investment cost. They do not include the expected costs of adaptation and mitigation under 2.6C of warming in the Economic Transition Scenario versus the 1.75C of warming in the Net Zero Scenario.

Source: BloombergNEF. Note: The numbers above the bars indicate cumulative investment and spending figures from 2024 to 2050. 'Fossil' includes conventional industry, internal combustion engine vehicle sales, fossil-fuel power and fossil-fuel processes. 'Low-carbon' includes clean industry, electric vehicle sales, heat pumps, hydrogen, carbon capture and storage, power grids, nuclear, energy storage and renewables.

Net-zero investments through 2050 account for 6.6% of Brazil's total GDP

Energy investment and spending, 2024-2050, Net-Zero Scenario



Brazil's energy investment and spending in the Net Zero Scenario account for 6.6% of the country's GDP. That's the second-largest share of any country.

As Brazil re-industrializes its economy and continues to invest in both clean energy supply and demand, energy transition investments might be the turning point for the country to diversify its economy and increase economic growth.

Source: BloombergNEF. Note: The numbers above indicate cumulative investment and spending figures from 2024 to 2050. Data include conventional industry, internal combustion engine vehicle sales, fossil-fuel power, fossil-fuel processes, clean industry, electric vehicle sales, heat pumps, hydrogen, carbon capture and storage, power grids, nuclear, energy storage and renewables.

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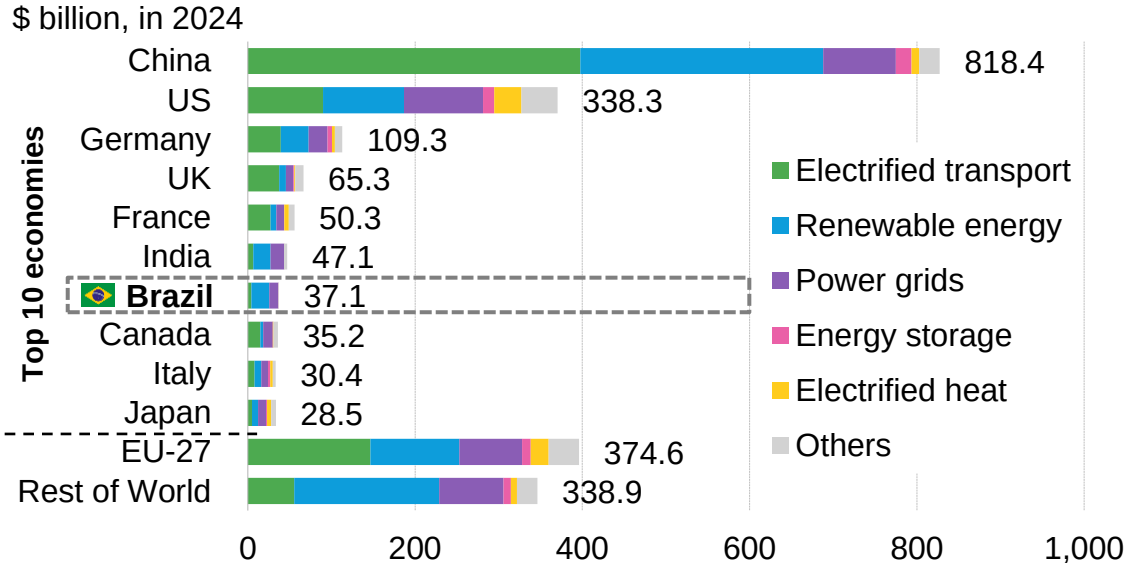
Brazil is a top global destination for energy transition investment

Top 10 economies for energy transition investment



Brazil is consistently one of the world's largest markets for investments related to the energy transition.

Brazil attracted $37 billion in energy-transition investment in 2024 (up from $35 billion in 2023), the seventh-highest figure globally and the second-highest among emerging markets outside of China.

Historically, its investment mix has been heavily dominated by renewable energy and power grids. Electrified transport spending doubled between 2023 and 2024 and is now responsible for 11% of the total.

Source: BloombergNEF's Energy Transition Investment Trends 2024. Note: EU-27 bar also includes the EU member states shown. 'Rest of World' is global investment excluding the EU and individual economies in the chart. A small amount of estimated spend for EU countries may be included in Rest of World. 'Others' include carbon capture and storage, clean shipping, clean industry, hydrogen and nuclear.

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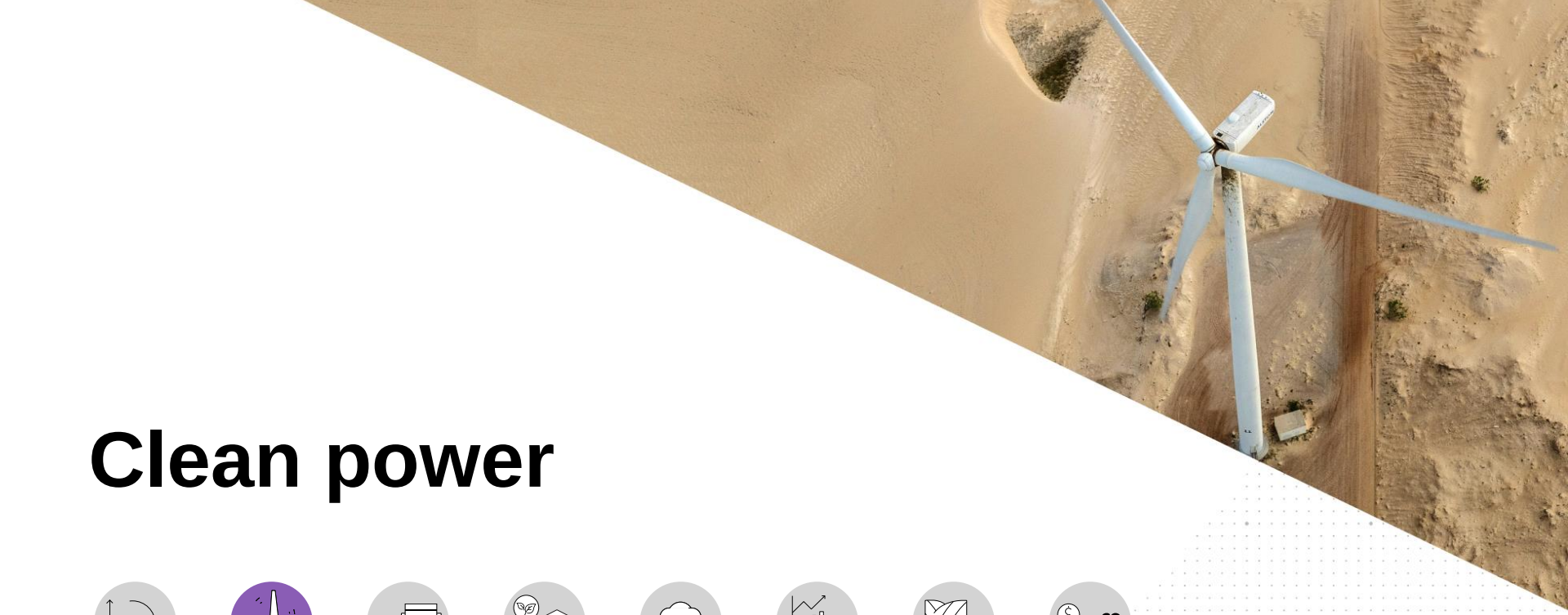

Clean power

Energy scenarios | **Clean power** | Decarbonizing transport | Decarbonizing industry | Energy transition metals | Sustainable finance | Agriculture and biodiversity | Carbon markets

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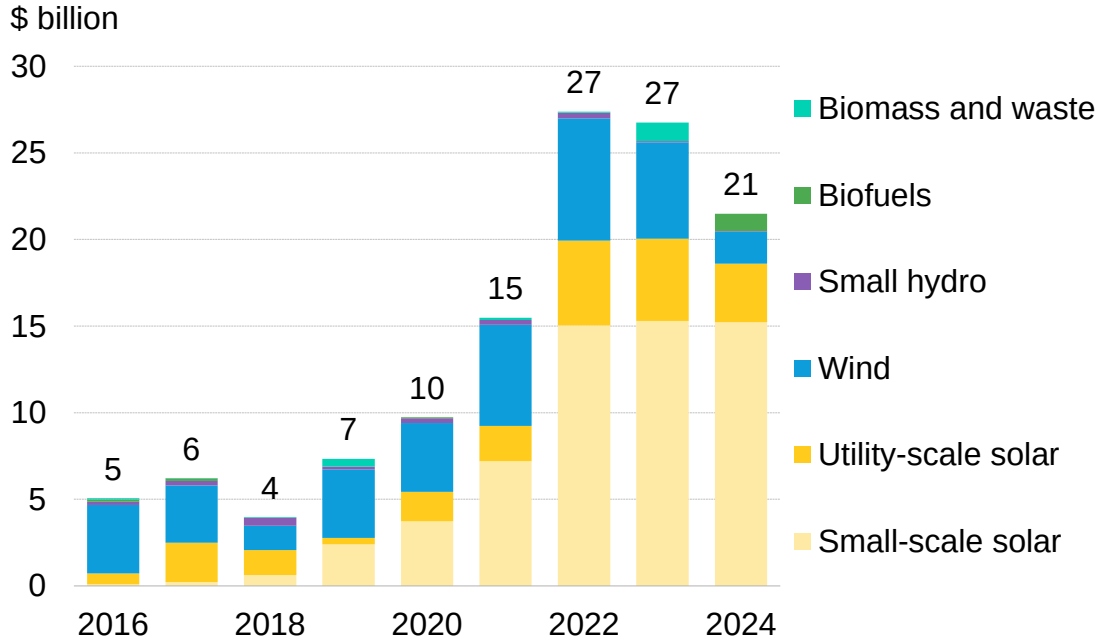
Following a boom in the early 2020s, renewable energy investment shrank in 2024

Estimated renewable energy investment in Brazil



Source: BloombergNEF's Energy Transition Investment Trends 2024.

Brazil's small-scale solar market has been the main driver of clean energy deployment in the country. Although total solar investment dipped slightly last year, it still raked in $18.6 billion.

The wind sector has cooled off significantly, with investment dropping 67% year-on-year in 2024 to $1.8 billion.

Biofuels came in third, with roughly $1 billion in investments.

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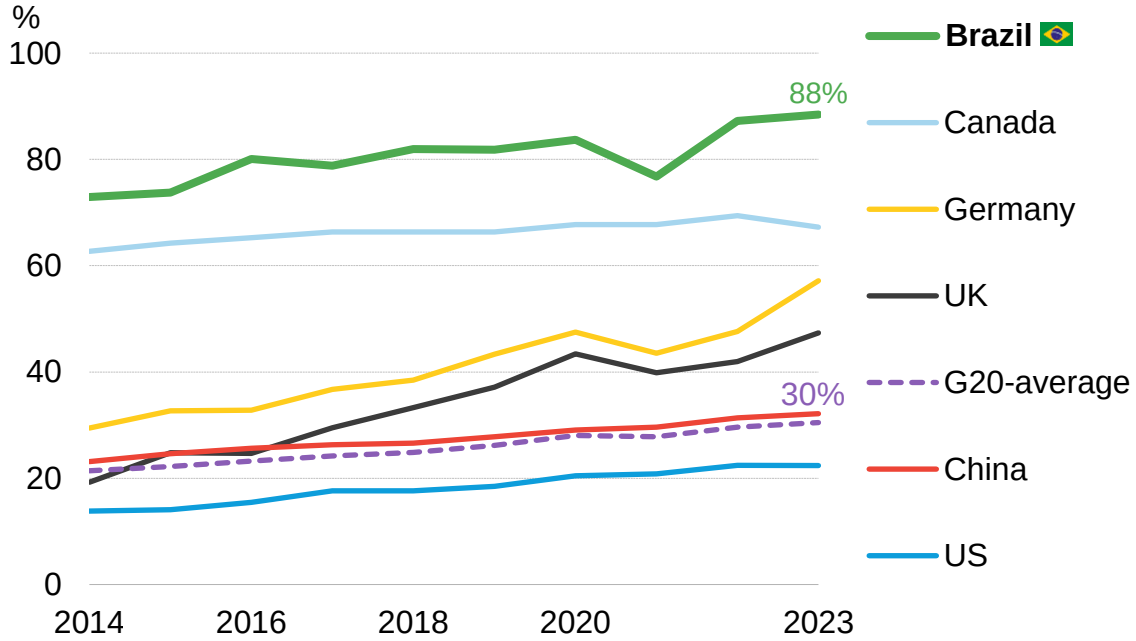
Brazil has the cleanest electricity generation among G-20 members

Share of renewable energy generation in selected G-20 countries



When it comes to renewable power generation, Brazil leads G-20 members by a wide margin.

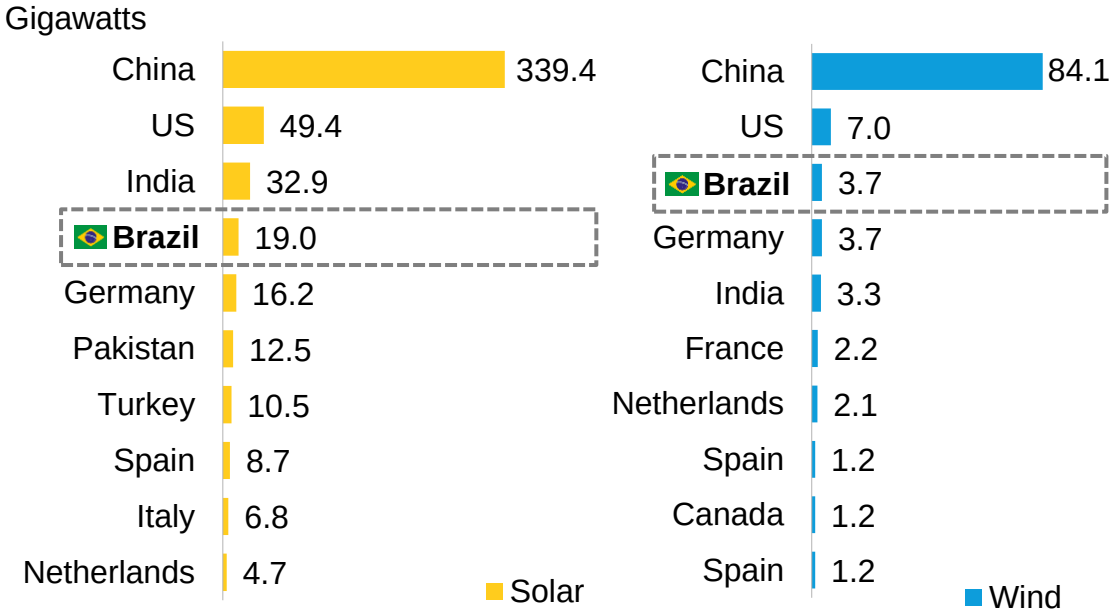
Brazil's power sector, long dominated by hydroelectric power plants, has evolved rapidly in recent years, with huge amounts of wind and solar added annually. The country's total installed capacity is now over 21% solar and 12% wind, which has boosted the country's clean power mix.

In total, 88% of Brazil's generation came from renewable sources in 2023.

Source: BloombergNEF's Power Transition Trends 2024. Note: Renewable energy includes large hydro.

Brazil ranks among the top markets globally for both wind and solar

Solar and wind capacity additions in 2024



Brazil is consistently among the top countries for renewable energy additions.

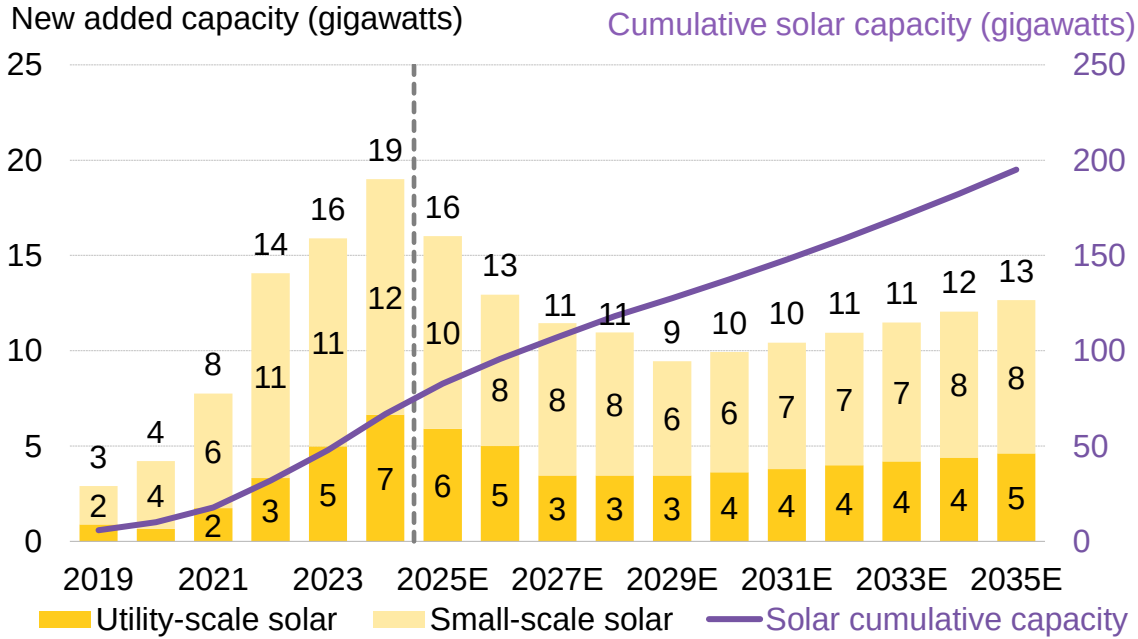
While solar is thriving globally, it is the small-scale sector that is doing particularly well in Brazil. These sub-5-megawatt installations have pushed Brazil into the top four countries for solar additions worldwide.

Brazil's wind sector has faced hurdles, yet it still managed to secure a top-three podium position last year.

Source: BloombergNEF's Global Wind Market Outlook and Global PV Market Outlook. Note: Countries ranked by total wind and solar additions. Wind includes offshore and onshore. Solar includes small-scale and utility-scale photovoltaic solar (PV). Solar capacity in direct current (DC).

Brazil's solar boom has been driven by the small-scale segment, but a cool-down is expected

Solar capacity forecast for Brazil



Brazil installed 19 gigawatts of solar last year, a new record.

The small-scale segment has been the main driver of this growth, as it is eligible for net-metering, allowing generators – both households and commercial consumers – to benefit from credit for power produced.

However, the country's small-scale sector faces development hurdles, including rising grid tariffs introduced by a 2022 reform to net-metering legislation, difficulties in getting permits from energy distributors, competition with the wholesale market and import taxes on modules.

Source: BloombergNEF's Latin America Market Outlook, Agência Nacional de Energia Elétrica (Aneel). Note: Capacity in direct current (DC). Volumes from 2025 on are estimates.

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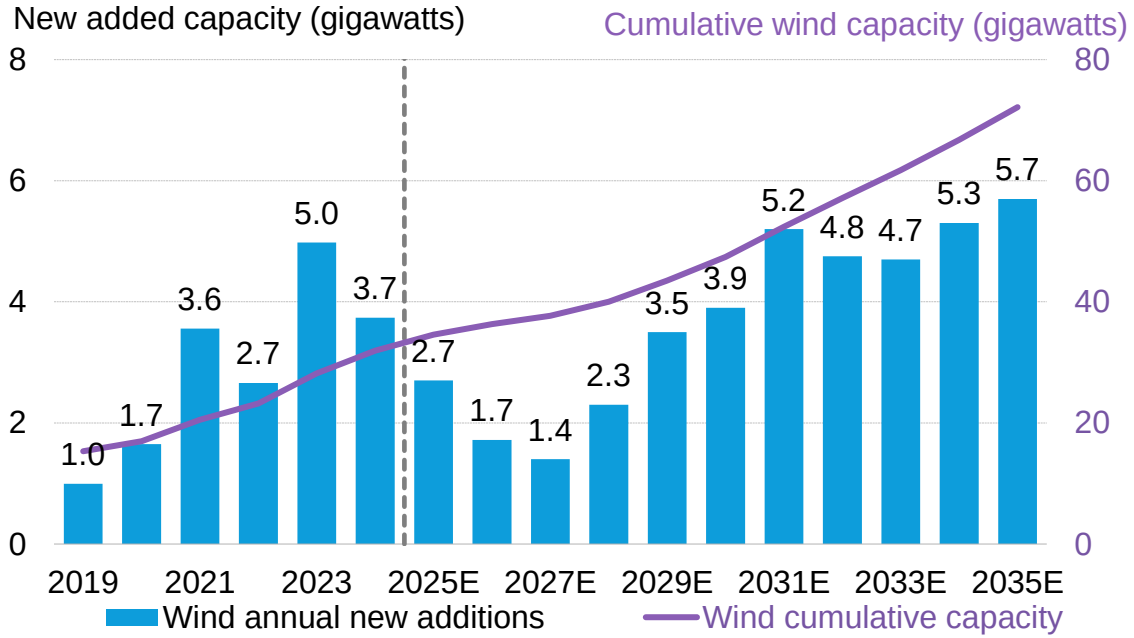
Brazil's wind market will slow in the short term before picking up again

Onshore wind capacity forecast for Brazil



Brazil's wind sector faces major headwinds, but there is a light at the end of the tunnel.

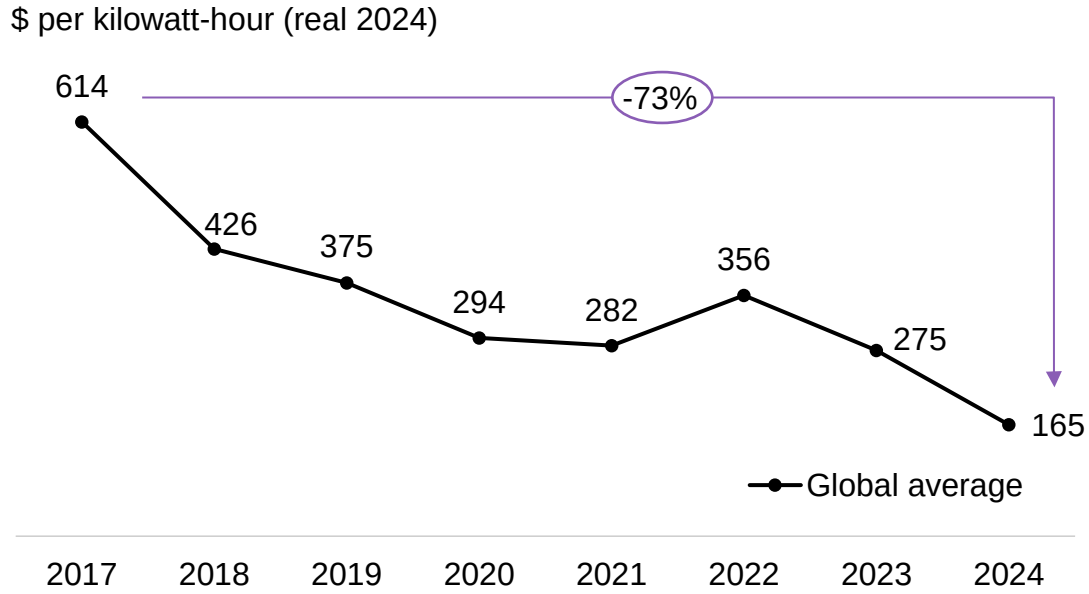
Booming cheap solar installations, uncertainties over generation curtailment and transmission bottlenecks have decreased demand for new power purchase agreements (PPAs) and limited new permitting and financing activity.

BNEF expects annual wind additions to drop from 5 gigawatts in 2023 to under 1.4GW in 2027. Additions are poised to climb again from 2028, as increased electrification in the country drives up power demand.

Source: BloombergNEF's Latin America Market Outlook, Agência Nacional de Energia Elétrica (Aneel). Note: Volumes from 2025 on are estimates.

Energy storage is expected to kick off in Brazil as grid constraints rise and battery costs fall

Historical prices for turnkey energy storage systems

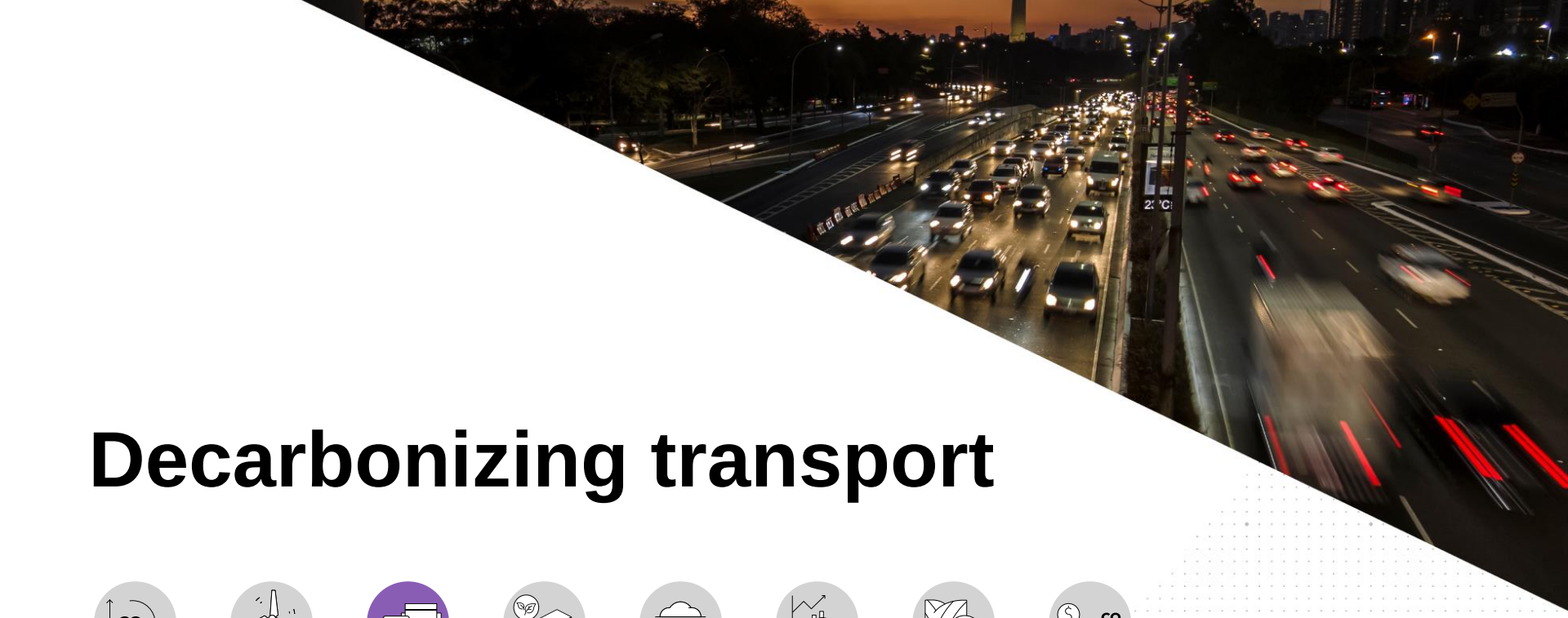


BNEF expects Brazil's battery storage market to grow rapidly over the next few years, as the technology becomes more competitive, wind and solar curtailment soar and mechanisms like auctions open up new revenue opportunities.

By 2035, BNEF expects four-hour turnkey energy storage system costs to drop another 45-57% from today's levels.

Brazil is likely to be heavily dependent on Chinese imports for batteries: Local manufacturing support and/or import tax exemptions could be a game changer for the local supply chain.

Source: BloombergNEF's Energy Storage System Cost Survey 2024. Note: Turnkey systems include all project equipment excluding EPC (engineering, procurement and construction) and grid connection for lithium-ion battery systems. Pricing based on usable capacity. Prices for 2023 and 2024 are for all durations and volume-weighted averages by region, while 2017-2022 prices are for four-hour systems only.



Decarbonizing transport

Energy scenarios | Clean power | **Decarbonizing transport** | Decarbonizing industry | Energy transition metals | Sustainable finance | Agriculture and biodiversity | Carbon markets

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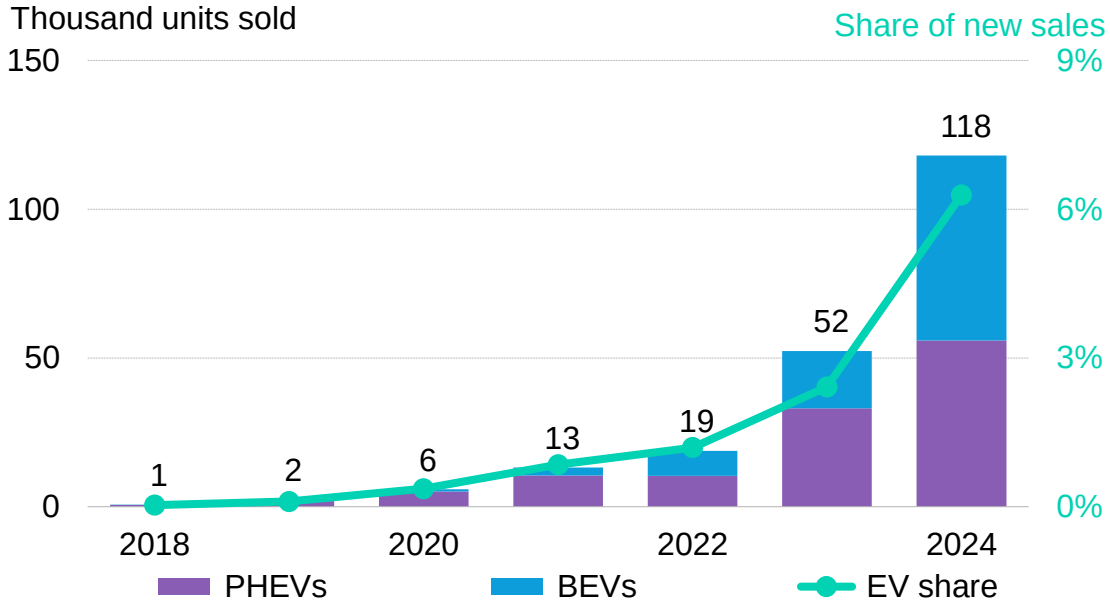
Electric vehicles are gaining momentum in Brazil: Sales grew 126% in 2024

Passenger EV sales and EV share of new passenger vehicle sales



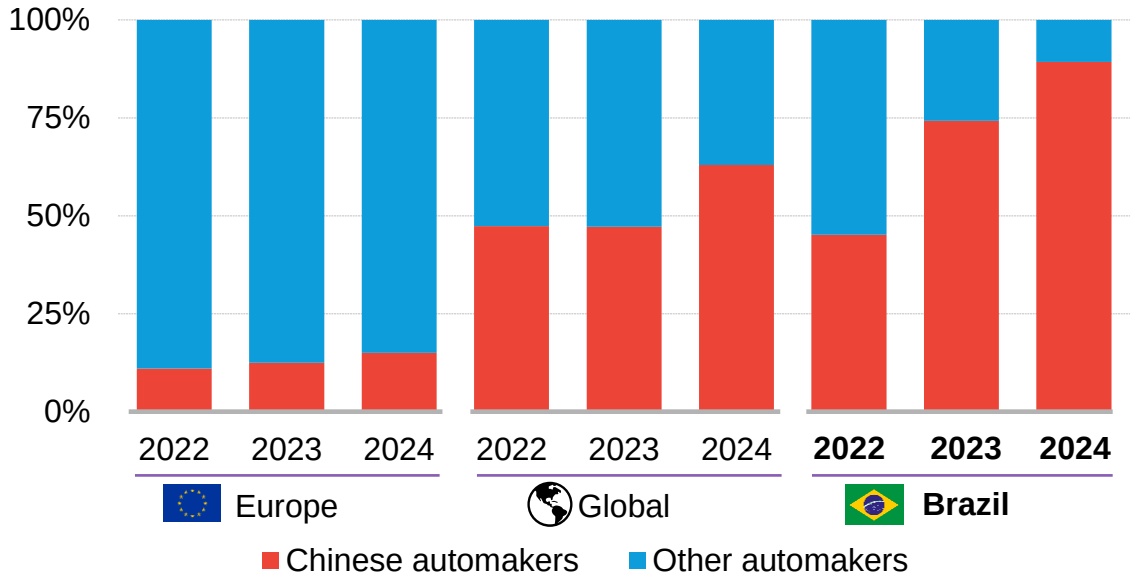
Electric vehicle sales in Brazil hit six digits in 2024, accounting for more than 6% of new passenger vehicles sold.

Hybrid and flex-fuel models are still expected to play an important role on the road to decarbonization, and automakers plan to expand their hybrid offerings with flex-fuel/ethanol-powered models of hybrid-electric vehicles.

Source: BloombergNEF's Latin America Electric Vehicle Outlook 2024-28, Associação Brasileira do Veículo Elétrico (ABVE). Note: BEVs are battery-electric vehicles; PHEVs are plug-in hybrid electric vehicles; HEVs are hybrid electric vehicles. For 2024 sales data, BNEF estimated November and December sales based on linear regression.

Chinese automakers dominate Brazil's electric vehicle market

Automakers' share of total passenger EV sales



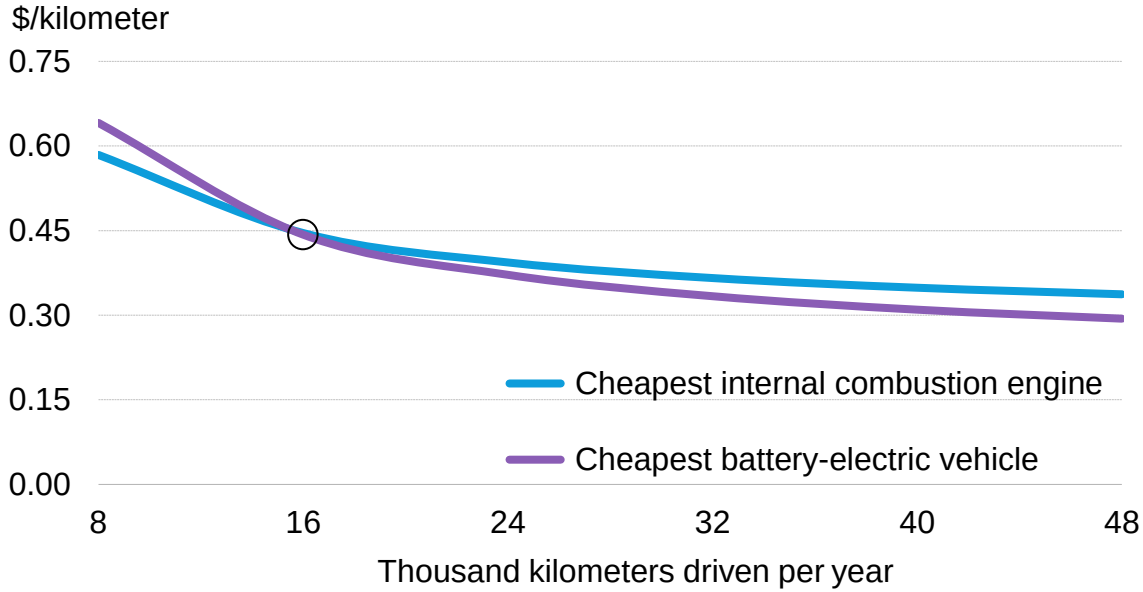
Chinese automakers produced 63% of all EVs sold globally in 2024, largely thanks to rapid EV adoption in emerging markets like Brazil.

In Brazil, nine out of 10 electric vehicles sold in 2024 were Chinese. BYD has enjoyed particularly rapid sales growth in Brazil in recent years. Chinese automakers could soon corner the Brazilian EV market even more, as both BYD and Great Wall Motors are planning to start producing cars in the country in 2025.

Source: BloombergNEF's Latin America Electric Vehicle Outlook 2024-28.

Drive over 44 kilometers daily in Brazil? An electric vehicle is more cost-efficient

Total cost of ownership over distance driven annually



Although EVs still have higher upfront prices than their gas car counterparts, their total cost of ownership could already be at parity with internal combustion engines (ICEs) in some segments and use cases.

For a Brazilian car owner who drives 16,000 kilometers per year, the lifetime cost for EVs and ICEs is roughly equal.

Beyond this break-even point, the higher the annual distance driven, the greater the cost savings offered by an EV.

Source: BloombergNEF's Latin America Electric Vehicle Outlook 2024-28. Note: 1 mile is equal to 1.6 kilometers. Note: Circle indicates approximate point when the total cost of ownership (TCO) for the battery-electric vehicle (BEV) drops below that of the internal combustion engine (ICE). Cheapest internal combustion engine vehicle is Fiat Mobi model and cheapest battery-electric vehicle is Kwid e-tech model.

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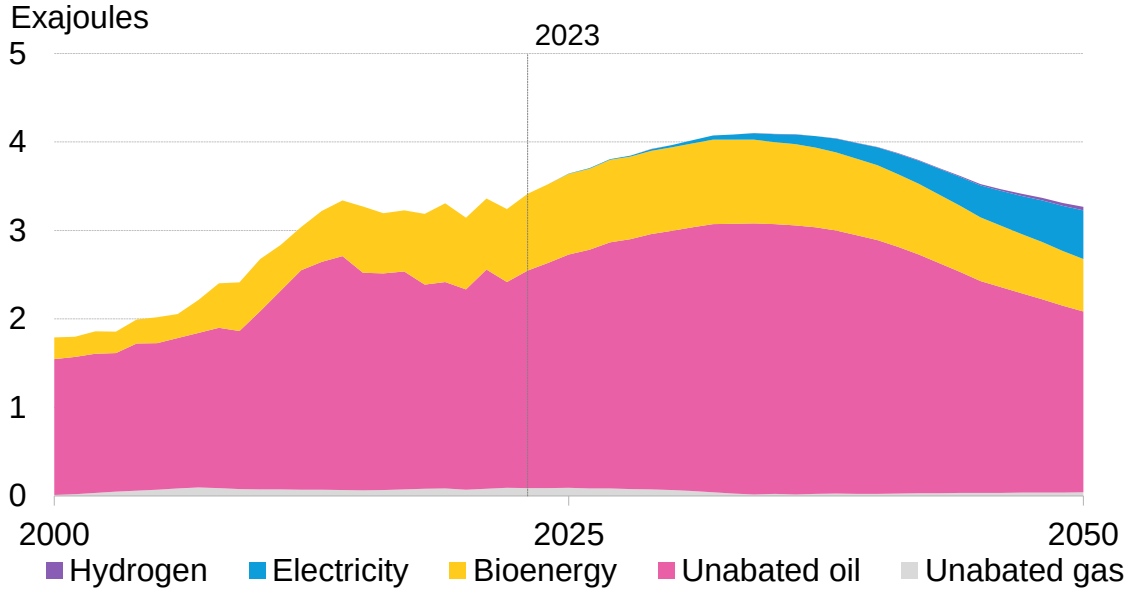
Electrification reduces the road sector's oil and bioenergy demand

Final energy consumption for road transport in Brazil, Economic Transition Scenario



Source: BloombergNEF's New Energy Outlook 2024: Brazil.

Low-cost electric vehicles could rapidly change the road sector's energy demand in Brazil.

Bioenergy accounted for 25% of final energy consumption in road transport in 2023, most commonly in the form of ethanol produced from sugar cane.

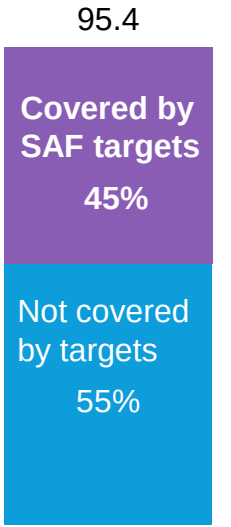
In BNEF's Economic Transition Scenario, demand for ethanol and other biofuels in road transport peaks in 2032 and falls 30% by 2050 compared with 2023 levels.

This biofuel surplus could be used in other areas, like sustainable aviation fuels (SAFs).

Biofuels beyond road transport: SAF demand is growing

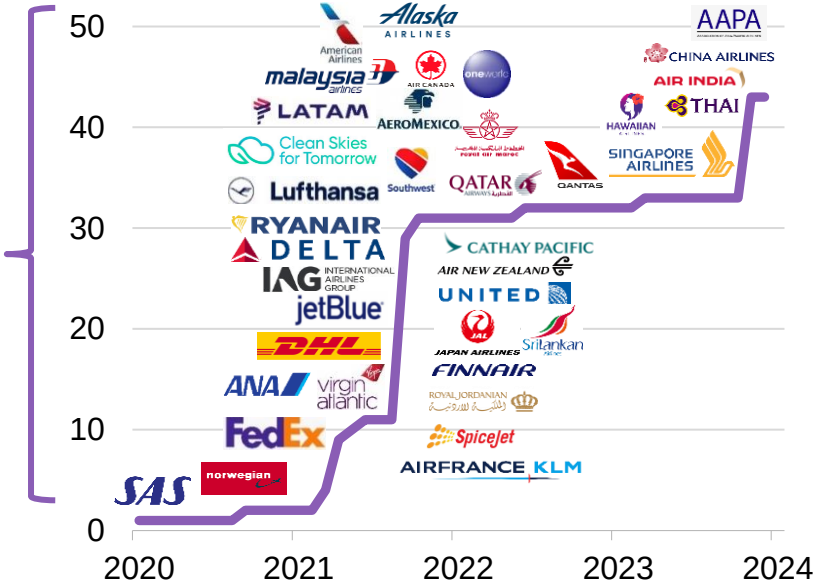
Jet fuel demand

Billion gallons, 2023



Airlines with SAF targets

Number of airlines



More than 40 airlines had set some kind of sustainable aviation fuel (SAF) target by the end of 2023.

This ambition, if realized, could have a sizeable impact on jet fuel markets, as these airlines account for 45% of total jet fuel demand globally.

In Brazil, legislation requires aviation companies to cut emissions through SAF consumption, starting with a 1% cut by 2027 and reaching 10% by 2037. These mandates will play a crucial role in increasing biofuel demand and production, BNEF expects.

Source: BloombergNEF's 2024 Sustainable Aviation Fuel Outlook: Getting Airborne, company announcements. Note: Includes airlines that have set a specific sustainable aviation fuel (SAF) target, ordered by announcement date. Total jet fuel demand for 2023.

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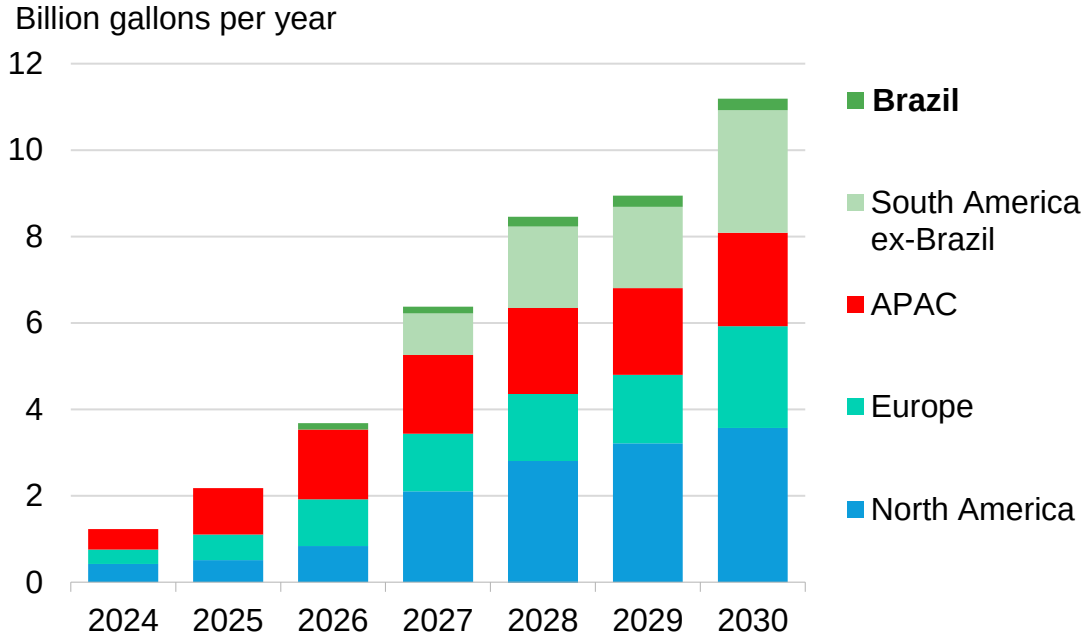
Announced SAF projects in Brazil account for just 2% of the global total in 2030

Announced SAF capacity



Source: BloombergNEF's Global Renewable Fuel Projects Tracker. Note: APAC refers to Asia Pacific.

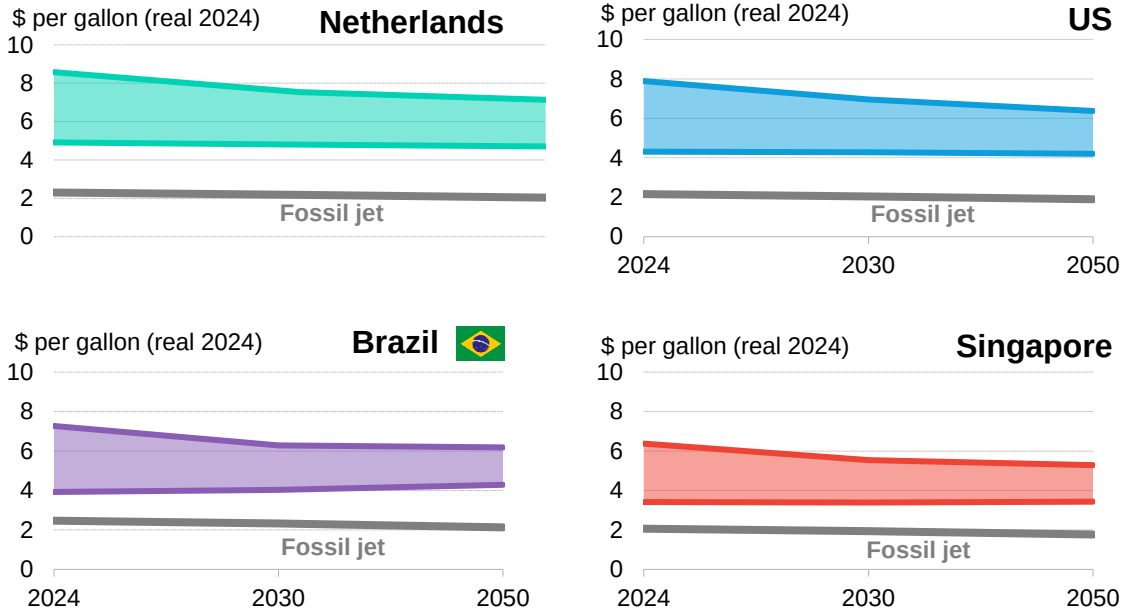
There is currently 259 million gallons per year of SAF production capacity planned for operation in Brazil by 2030 – a fraction of global supply.

In 2023, Brazil's jet fuel demand reached 1.7 billion gallons per year. The announced SAF projects would supply 15% of that.

Yet BNEF expects that the actual build will be 56% below the total announced volume, as SAF projects are capital-intensive infrastructure projects that often struggle to reach completion.

Brazilian SAF could be competitive, but other markets are expected to have lower prices

Levelized cost of hydroprocessed SAF, by market



Brazil can produce a cost-competitive SAF for as little as $3.92 per gallon today – but this is 59% more expensive than traditional fossil-based jet fuel.

Feedstock costs make up at least 80% of the cost to produce hydroprocessed SAF. Across the four regions analyzed, SAF costs in the low and high scenarios ranged from $3.41 to $8.57 per gallon in 2024. Brazil has the second-lowest value, just behind Singapore.

SAF is expected to cost 1.6 to 3.7 times more than fossil-based jet fuel between now and 2050 in all of BNEF's modeled scenarios.

Source: BloombergNEF's Renewable Fuel Levelized Costs. Note: Assumes refinery runs at 95% capacity producing 55% jet fuel, 25% renewable diesel, 5% naphtha and 15% light ends. Green and gray hydrogen costs are based on BNEF's 2023 Hydrogen Levelized Cost Update.

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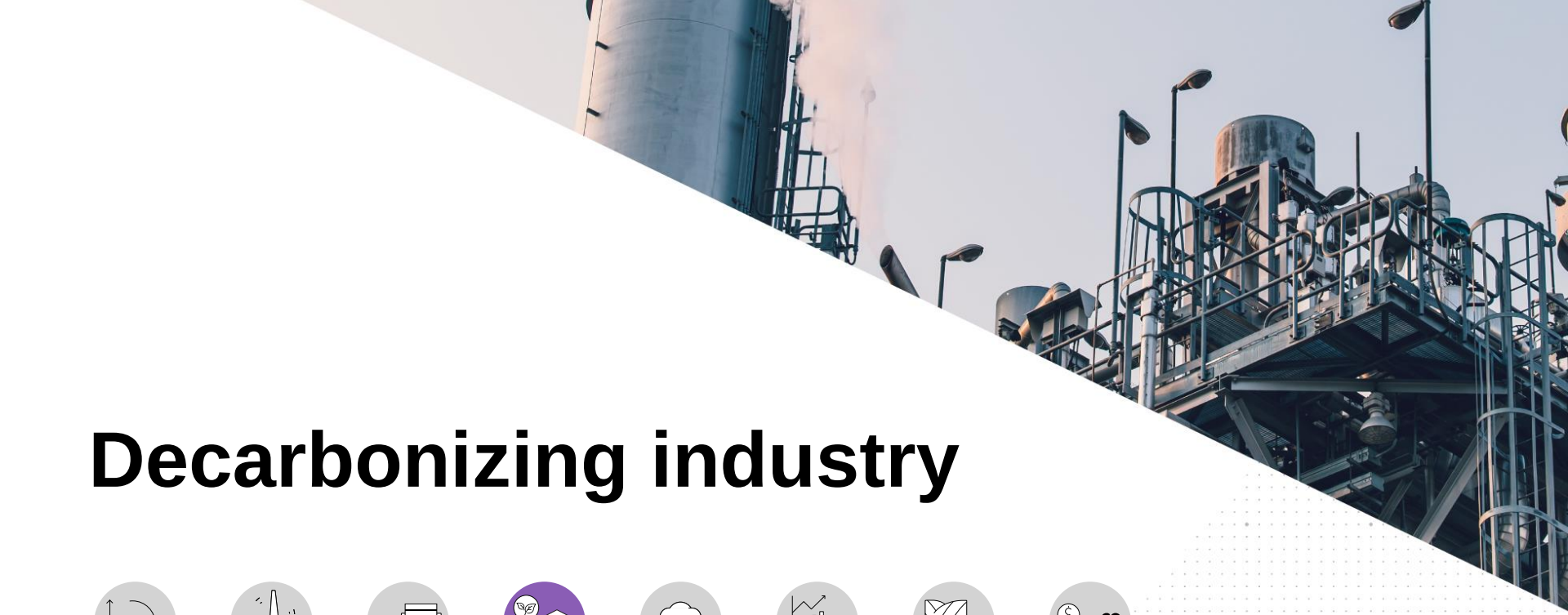

Decarbonizing industry

Energy scenarios | Clean power | Decarbonizing transport | **Decarbonizing industry** | Energy transition metals | Sustainable finance | Agriculture and biodiversity | Carbon markets

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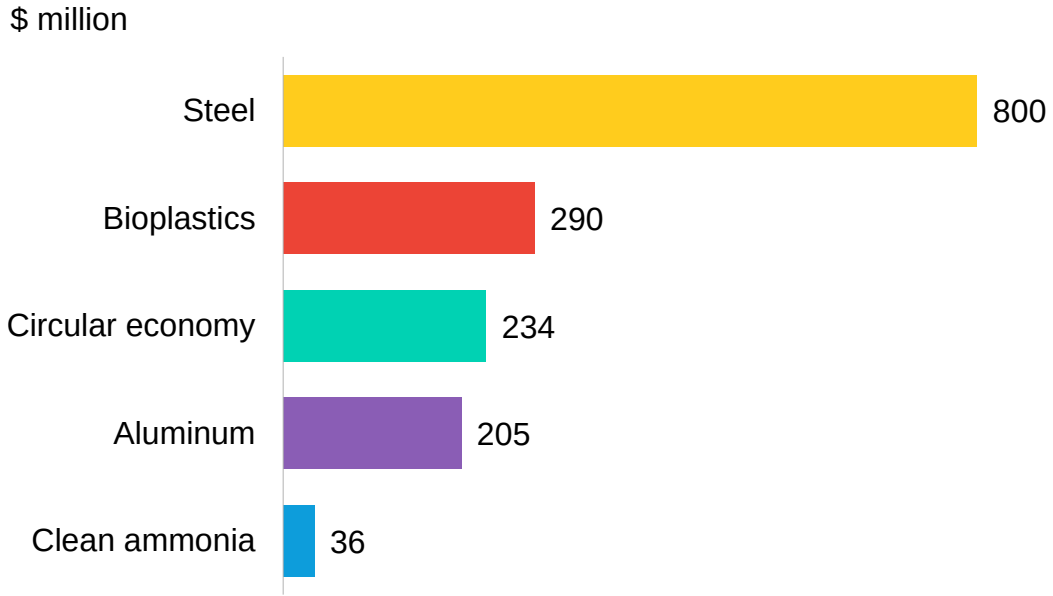
Brazil has invested $1.5 billion in clean industry since 2018, mainly in steel

New investment in clean industry in Brazil, 2018-2024



Globally, clean industry investment decreased by 50% year-on-year in 2024. Weak economic conditions, delays in some policy programs and uncertainty in key markets all led investors to pump the brakes on new projects.

Brazil's investment in clean industry represents less than 1% of the global total since 2018, and over half of this investment has gone towards steel decarbonization. Bioplastics came in a distant second, although Brazil has one of the most consolidated production routes in the world for bioplastics by using ethanol from sugar-cane.

Source: BloombergNEF's Energy Transition Investment Trends Report. Note: Aluminum is separated from the circular economy sector. The clean industry supersector includes deals for projects that produce clean steel, clean ammonia and bioplastics, as well as investments for circular economy projects. It includes all new-build and retrofit projects that disclose a final investment decision; award engineering, procurement and construction contracts; or begin construction.

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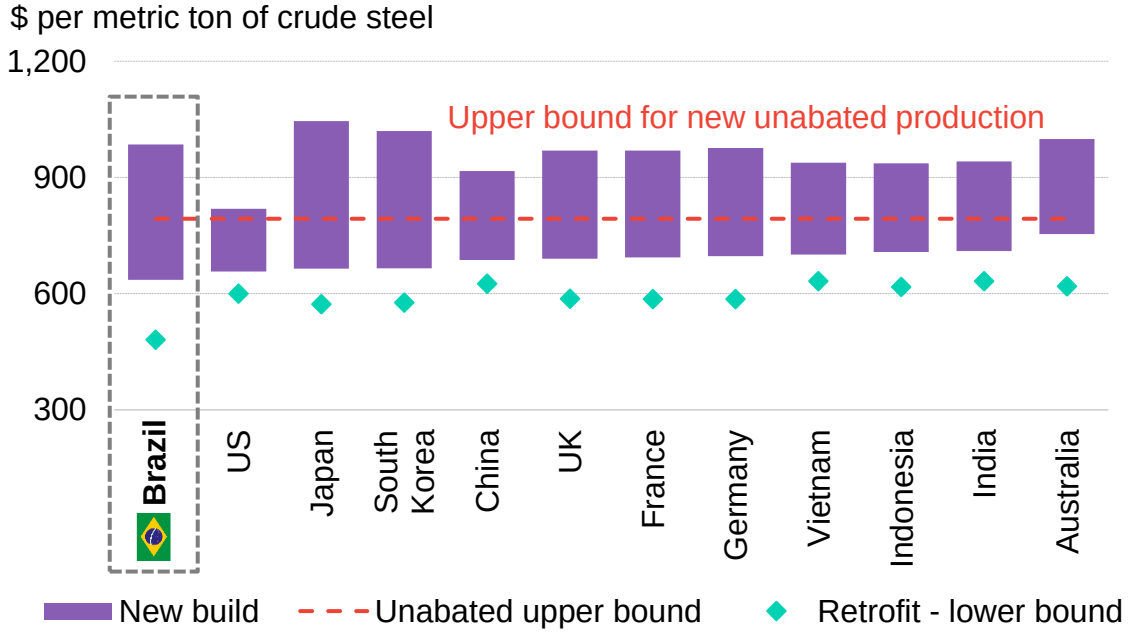
Biomass is expected to make Brazil one of the most competitive clean steel producers

Projected levelized cost of low-emissions steel, 2030



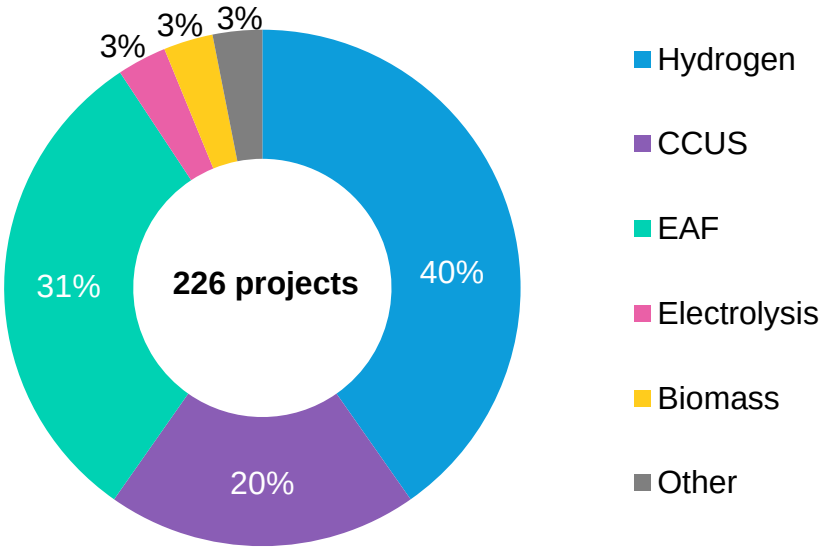
By 2030, low-emissions steel in almost every market analyzed could compete with the most expensive new-build unabated production.

Brazil's abundant biomass and very low electricity prices contribute to the country having the cheapest green steel in the world by 2030, BNEF forecasts.

Source: BloombergNEF's SteelVal Model, 2024. Note: Chart range does not include molten oxide electrolysis. Costs are shown in real 2023 US dollars.

Hydrogen has the potential to decarbonize iron and steel production

Share of total number of iron and steel decarbonization projects proposed, by emissions abatement technology



Around the world, 40% of announced low-carbon iron and steel projects are set to use hydrogen as their chief fuel. However, some of these announced projects have been facing challenges due to high prices.

By contrast, biomass accounts for just 3% of planned projects, but it is already producing low-carbon steel in Brazil. The country currently has some commercial green steel plants in operation, which use biomass as its abatement technology.

Source: BloombergNEF's Industry Decarbonization Market Outlook 2H 2024, public announcements. Note: The direct reduction furnace (DR) and the electric arc furnace (EAF) in a DR-EAF project are counted as two separate projects. 'Other' refers to a combination of technologies. CCUS is carbon capture, utilization and storage. Data as of December 3, 2024.

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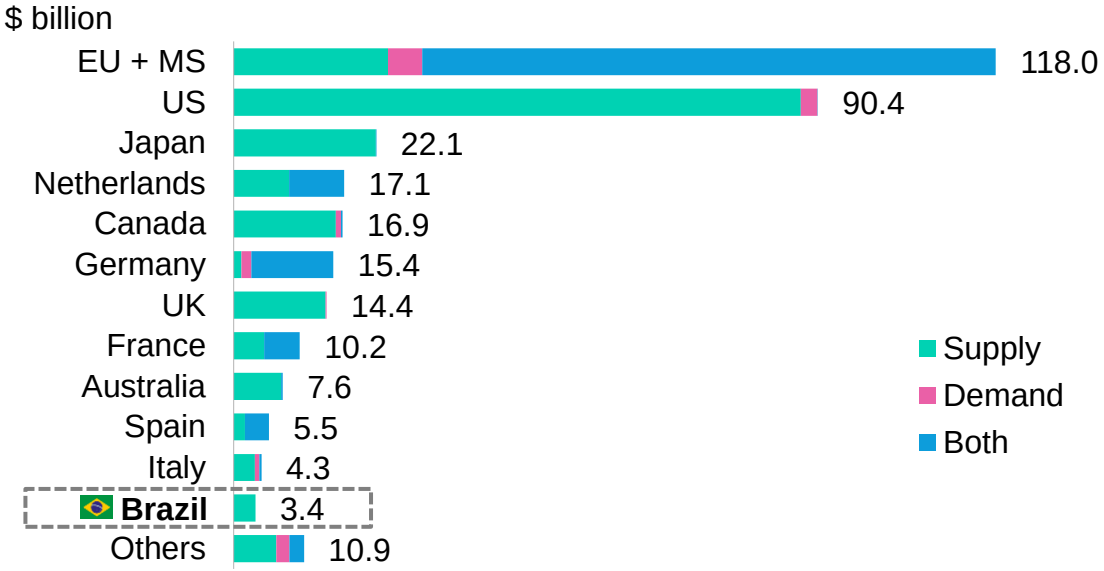
Governments are subsidizing hydrogen production to decarbonize industry

Promised government support for hydrogen, by market and target



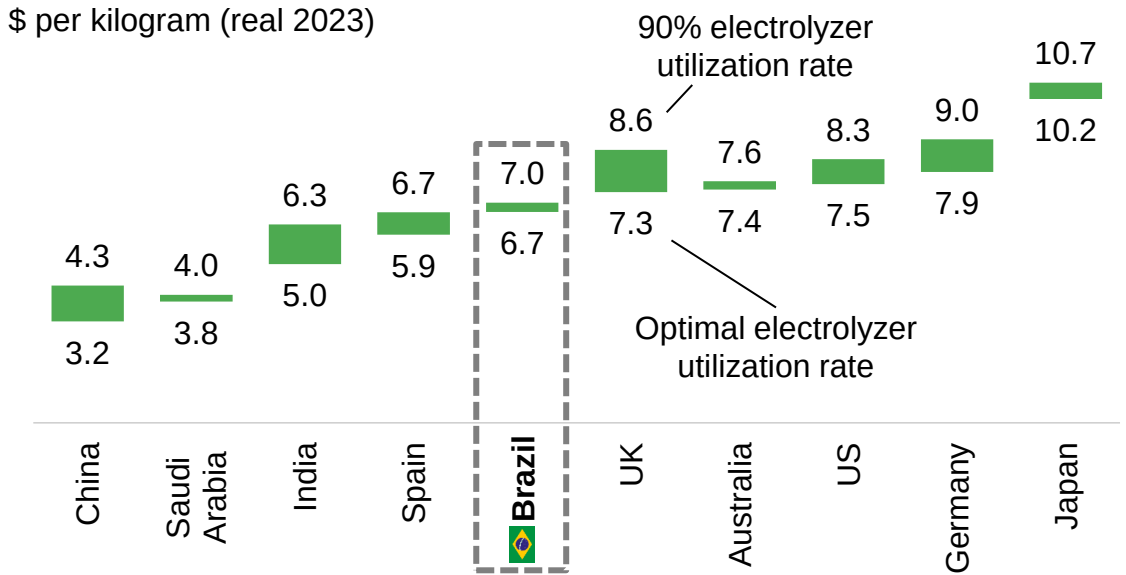
Clean hydrogen has long been viewed as a method for decarbonizing hard-to-abate industry emissions, and public funding committed to support the fuel tops $275 billion globally. Grants lead, with 45% of global funding coming from national programs across the EU. Tax credits, the top funding mechanism in the US, come second, with 38% of the global total.

In 2024, Brazil announced a tax credit with a budget of about $3.4 billion for low-carbon hydrogen, allocated over 2028 to 2032. This is a fraction of what developed economies have set in place.

Source: BloombergNEF's Hydrogen Subsidies Tracker. Note: Supply funds support hydrogen production and equipment manufacturing. 'Both' refers to programs that can fund supply and demand projects. Demand funds support end-use technologies and hydrogen use. Support for hydrogen transport and storage counts under 'both.' EU + MS is European Union + Member States. 'Others' are Austria, Belgium, China, Croatia, Denmark, Estonia, Finland, Greece, India, Lithuania, Norway, Poland, Portugal, Romania, South Korea, and Sweden. Data as of March 17, 2025.

Hydrogen costs are unlikely to hit the hoped-for $1/kilogram

Levelized cost of hydrogen for off-grid projects, optimal to 90% electrolyzer utilization in 2025

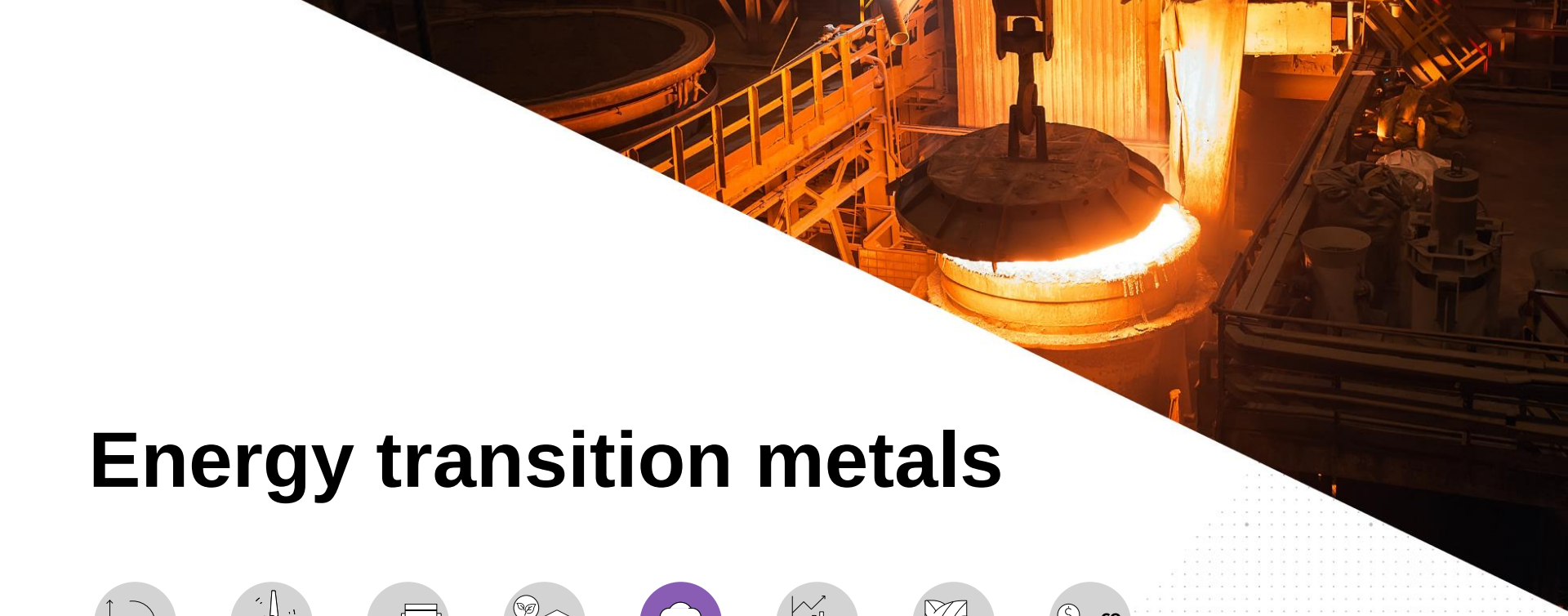


The levelized cost of hydrogen made with off-grid renewables is set to stay higher for longer.

Renewable hydrogen only becomes competitive with gray in a handful of markets, and only after 2030. This will hurt renewable hydrogen's attractiveness as a decarbonization strategy, barring an electrolyzer cost breakthrough.

Brazilian developers will likely aim for grid-connected hydrogen projects, which could further decrease costs, depending on total grid connection and power costs.

Source: BloombergNEF's Hydrogen Levelized Cost Outlook 2025 . Note: '90% electrolyzer utilization rate' is the electrolyzer utilization rate in the baseload scenario. 'Optimal electrolyzer utilization rate' is the electrolyzer utilization rate that produces the lowest levelized cost of hydrogen.



Energy transition metals

Energy scenarios | Clean power | Decarbonizing transport | Decarbonizing industry | **Energy transition metals** | Sustainable finance | Agriculture and biodiversity | Carbon markets

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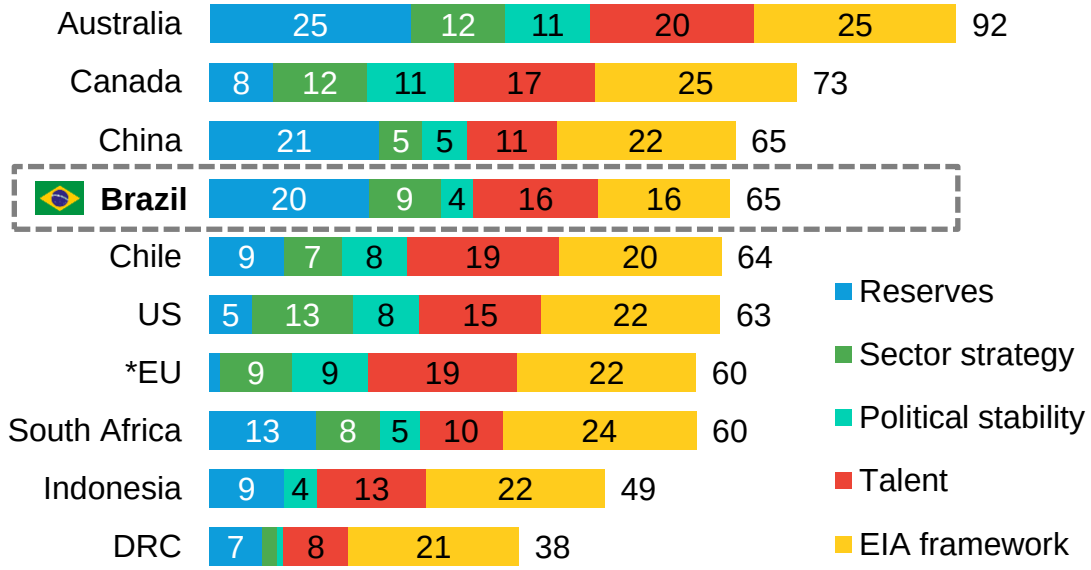
Brazil is well positioned to be a key provider of energy transition metals

Energy transition metals production scores



The global energy transition is driving demand for the metals and minerals that underpin low-carbon technologies. However, the supply of many of these essential raw materials is constrained.

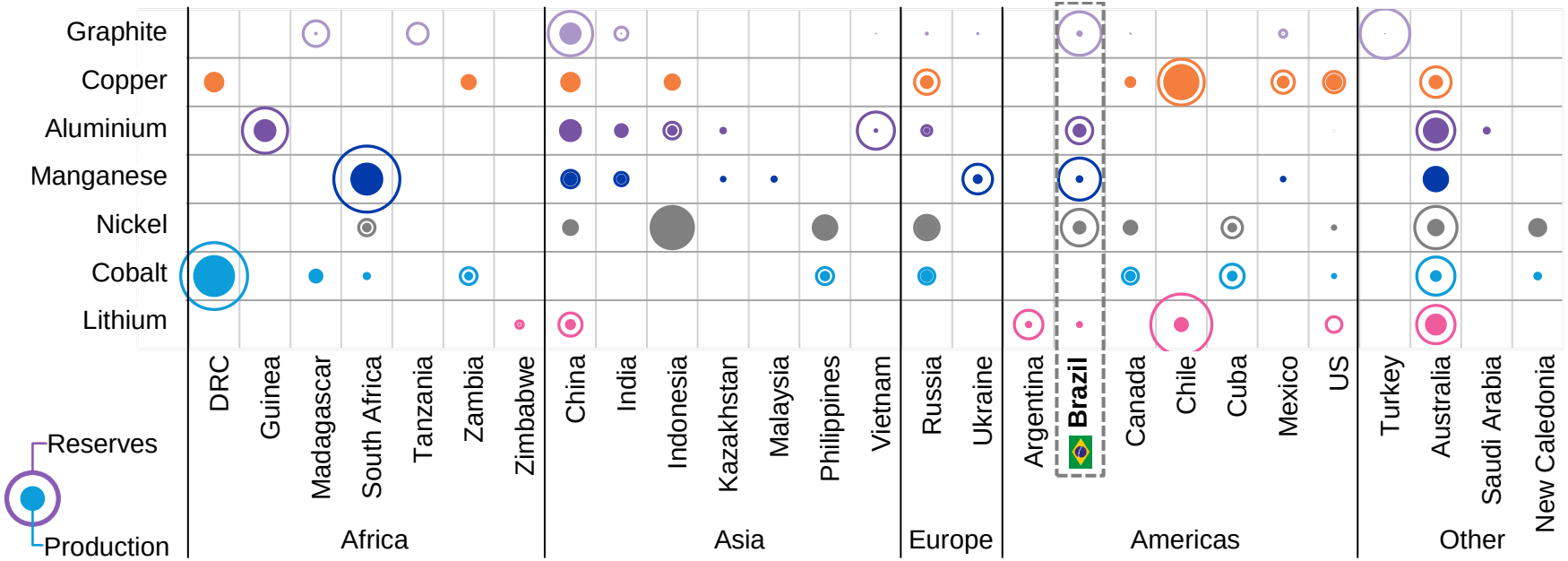
BNEF assessed the readiness of 10 markets to boost supply according to their reserves, sector strategy, political stability, availability of talent and Environmental Impact Assessment (EIA) framework.

Brazil ranked fourth in the overall score, with strengths in reserves and talent, but opportunities for improvement in political stability and EIA framework remain.

*Source: BloombergNEF's Energy Transition Metals Production Scores. Note: DRC is Democratic Republic of Congo. EIA stands for Environmental Impact Assessment, a legal tool used to identify and interpret the environmental impact of a development project and propose mitigation approaches *Poland is used as a proxy for the EU's mining salaries and EIA framework scores. The entire bloc is evaluated for the other categories.*

Brazil is well endowed with mineral resources, but production has yet to ramp up

Battery materials: Reserves and production



Source: BloombergNEF, US Geological Survey 2023. Note: The solid spheres represent production, the outer circle represents the total reserves. Size of spheres and circles denote proportionality of the resource between regions.

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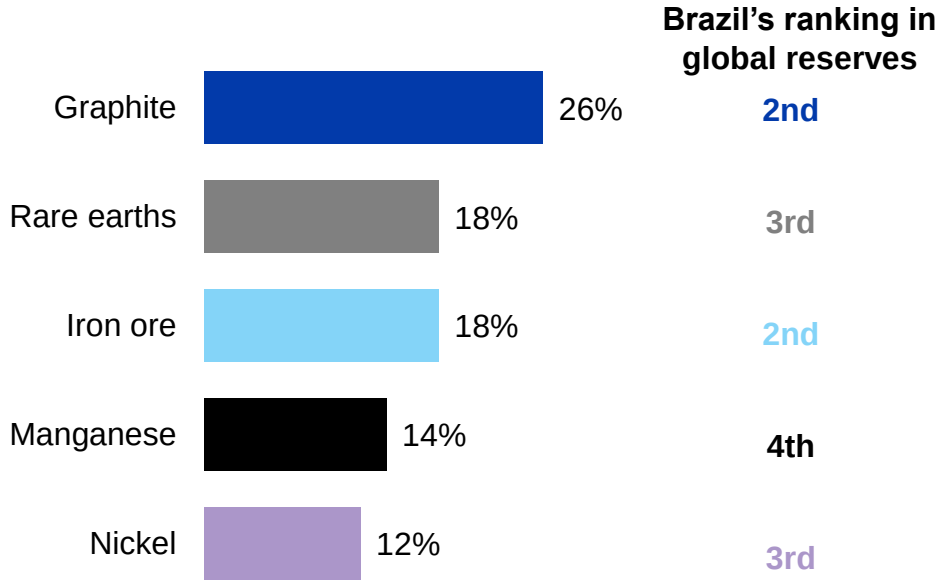
Brazil holds at least 10% of global reserves for five strategic minerals with high demand forecast

Share of Brazil's reserves out of global total



Brazil is among the countries with the largest reserves of energy transition metals. In BNEF's "Energy transition metals production scores," Brazil's reserves come in third, behind only Australia and China.

These metals are expected to experience a significant demand increase through 2050. Under BNEF's Net Zero Scenario, demand for rare earths triples between 2023 and 2050, while demand for graphite could grow 2.2x over the same period.

Source: BloombergNEF's Energy Transition Metals Production Scores, United States Geological Survey.

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Sustainable finance

Energy scenarios | Clean power | Decarbonizing transport | Decarbonizing industry | Energy transition metals | **Sustainable finance** | Agriculture and biodiversity | Carbon markets

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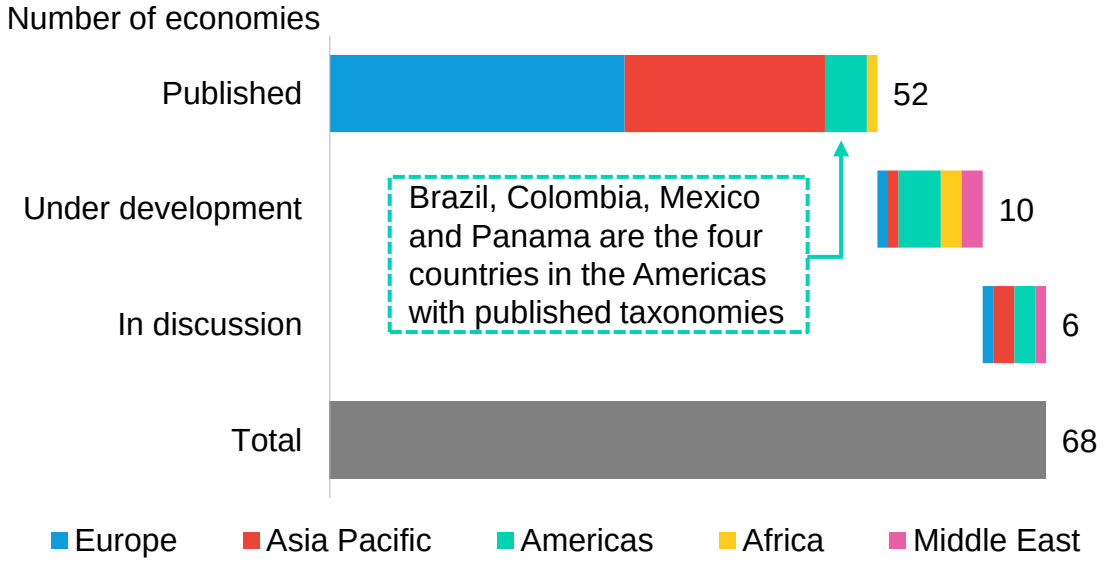
Brazil gets real about its sustainable finance taxonomy

Sustainable taxonomies across the globe as of July 2024



Brazil already has in place a voluntary, industry-led taxonomy built by the bank association Febraban (Federação Brasileira de Bancos), and the Ministry of Finance published its sustainable taxonomy action plan in December 2023.

While economies continue to develop their local classification systems, so far only the EU taxonomy mandates reporting, with the rest remaining voluntary. Brazil and the UK seem to be the only other jurisdictions that plan to make reporting compulsory once their green frameworks are out.

Source: BloombergNEF. Note: Brazil is marked as 'published' as the industry-led taxonomy is already in place, although the government-led taxonomy is currently under development. The colors in the map for the members of the Association of Southeast Asian Nations (ASEAN) reflects the existence of ASEAN's green taxonomy. In addition, some ASEAN member states have published or are developing their own versions. Data as of July 2024.

Brazil's sustainable finance taxonomy draft is comparable to those in other jurisdictions

Comparison of sustainable finance taxonomies

Metric	Brazil	EU	Mexico
Scope	7 environmental objectives 4 socio-economic objectives	6 environmental objectives	6 environmental objectives 4 social objectives
Themes included	Social and environmental (including transition)	Environmental	Social and environmental
Technical screening criteria/do no significant harm/minimum social safeguards?	All of them	All of them	All of them
Legal status	Mandatory	Mandatory (for a set of companies)	Voluntary
First mandatory reporting	2026	2024	N/A
Target groups	To be determined	Corporations, investors, banks	All

Source: BloombergNEF. Note: N/A is not available.

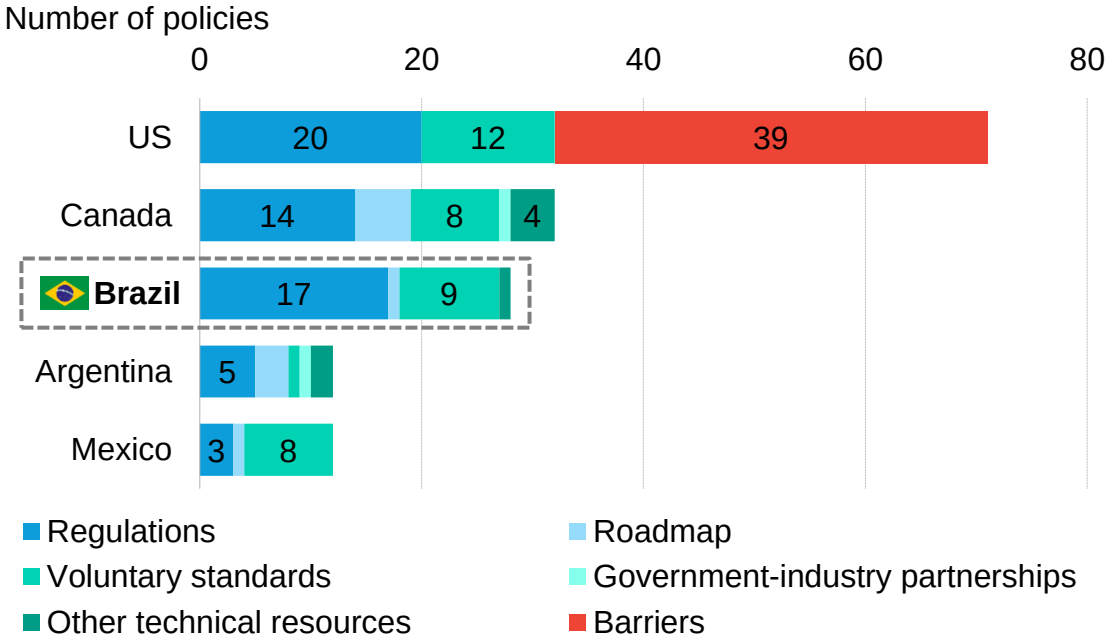
Brazil's sustainable finance taxonomy is expected to be finalized by July 2025, following multiple rounds of consultations with Brazilian stakeholders.

Brazil could become a global leader in sustainable finance taxonomy, as the EU has been discussing a rollback to its sustainability reporting regulations in early 2025.

The EU's "Sustainability Omnibus" waters down landmark sustainability reporting regulations in a bid to reduce the reporting burden on EU companies. This could limit investors' access to climate data – and their ability to drive capital toward the energy transition.

Brazil is a leader for sustainable finance policies in Latin America

Sustainable finance policies of G-20 members in the Americas, by framework phase



Source: BloombergNEF. Note: Proposed and scheduled policies are included.

Brazil has as many as 28 policies targeting corporations, investors and banks. Banks with assets representing more than 0.1% of the country's gross domestic product (of which there are 473 today) must disclose their risks and opportunities from climate change, while 277 pension funds with a combined $240 billion of assets must disclose ESG data.

Unlike in the US, there has been limited pushback against sustainable finance policy in Brazil. Rather, Brazil's central bank has pushed the country to become a policy leader in Latin America, with resolutions that require banks to consider and integrate environmental, social and climate risks.

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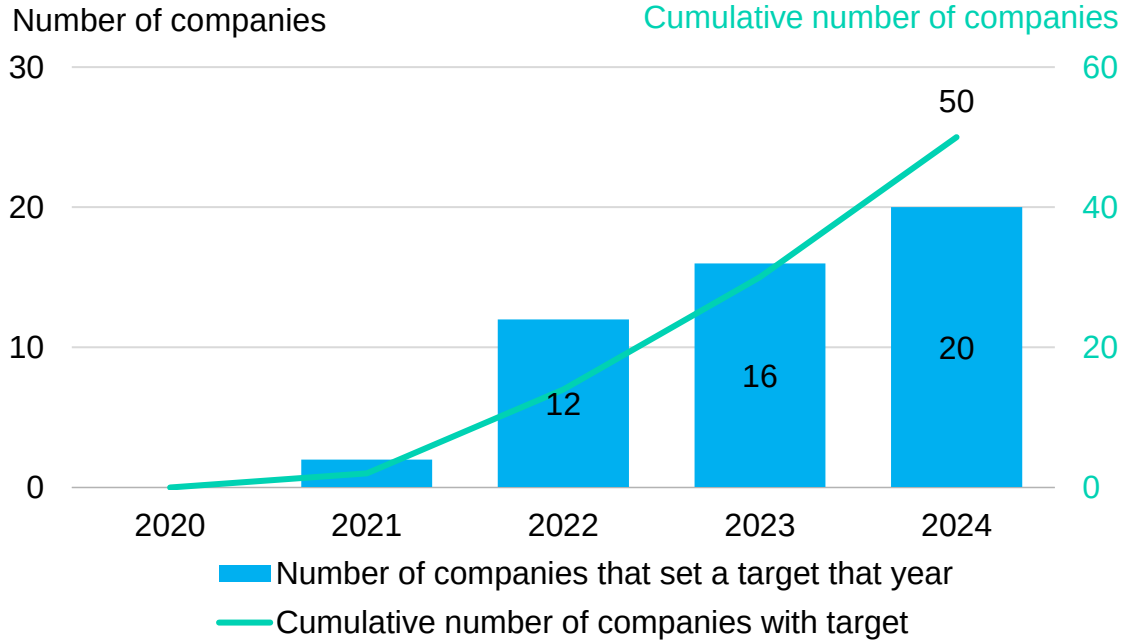
Brazilian companies ratchet up their sustainability commitments

Brazilian signatories to the Science-Based Targets initiative (SBTi)



Since the Task Force on Climate-Related Financial Disclosures (TCFD) was disbanded in 2023, the Science-Based Targets initiative (SBTi) has become the new industry standard for sustainability commitments.

Brazilian companies have been increasing their commitments, with the mining sector accounting for 18% of all signatories in the country, followed by food and beverage companies at 10%.

Source: BloombergNEF, Science-Based Targets Initiative (SBTi).

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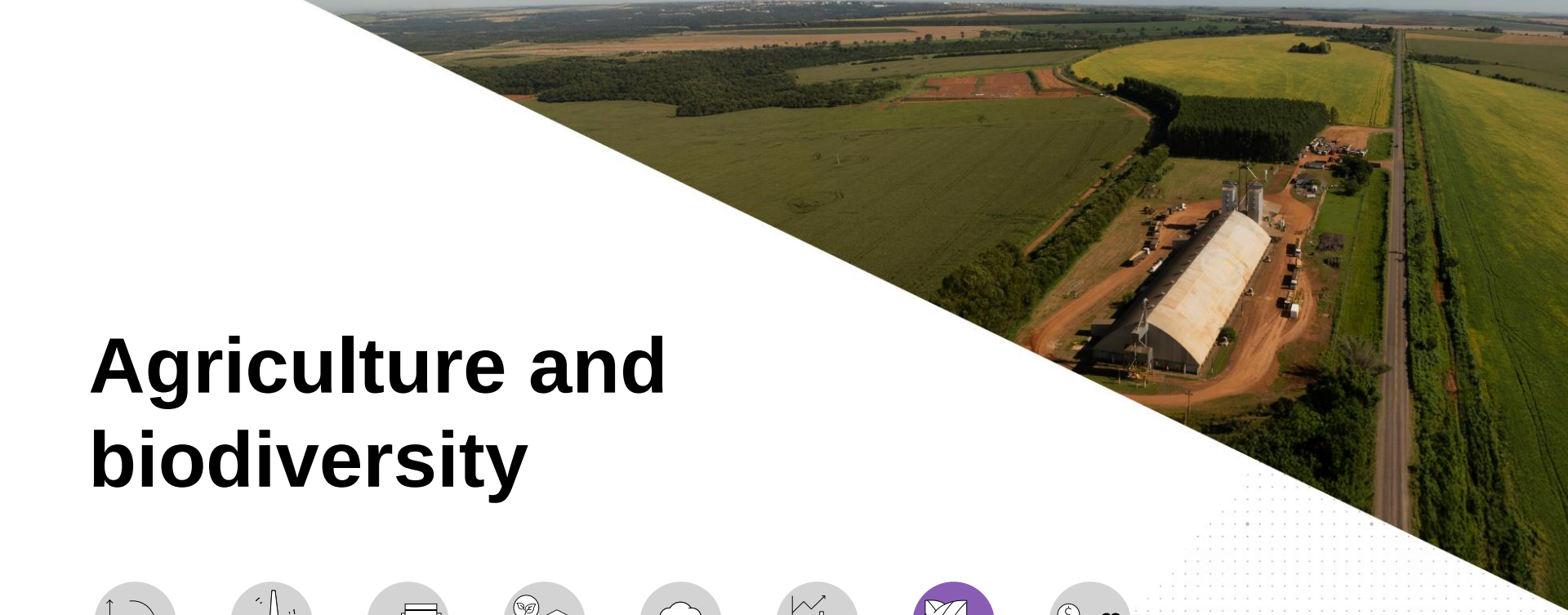

Agriculture and biodiversity

Energy scenarios | Clean power | Decarbonizing transport | Decarbonizing industry | Energy transition metals | Sustainable finance | **Agriculture and biodiversity** | Carbon markets

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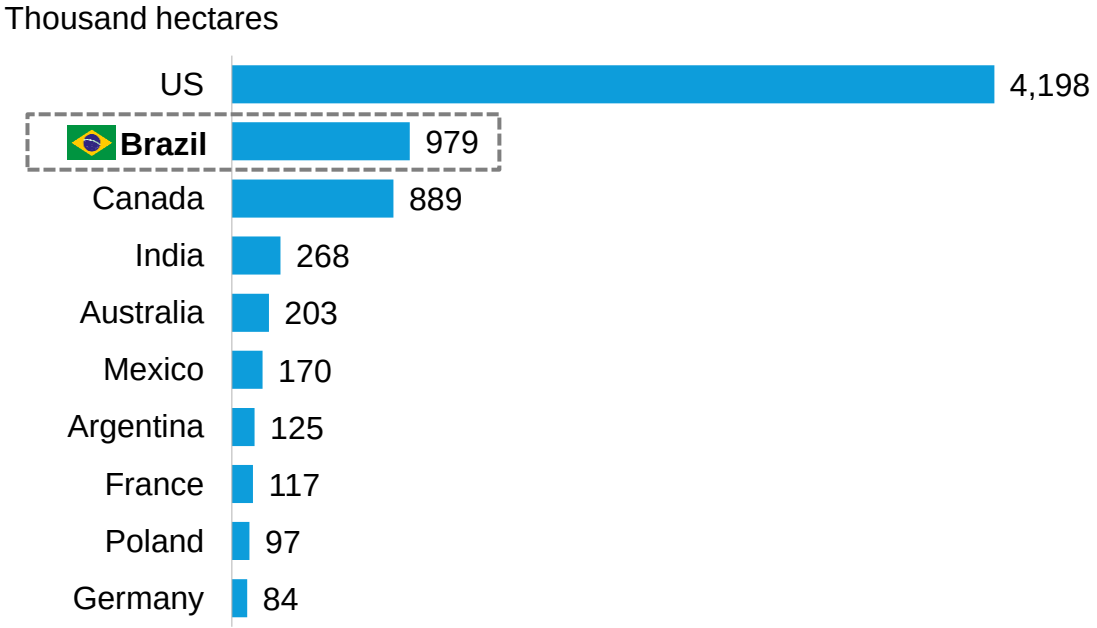
Brazil is the second-largest market for corporate regenerative agriculture

Top 10 corporate regenerative agriculture markets



Source: BloombergNEF's Corporate Regenerative Agriculture, company filings. Note: Analysis considers only corporate-led projects.

Brazil's government has fostered sustainable agriculture through multiple initiatives. The Brazilian Ministry of Agriculture, Livestock and Food Supply pledged $1.3 billion annually for lower-carbon agriculture, including regenerative farming, in 2024.

The Brazilian Agricultural Research Corporation (Embrapa) supports regenerative agriculture through investments in technologies such as biologicals, reducing their manufacturing cost and the price for farmers. For example, biologicals – or inputs derived from living organisms – are now deployed across 24% of Brazilian soy acres.

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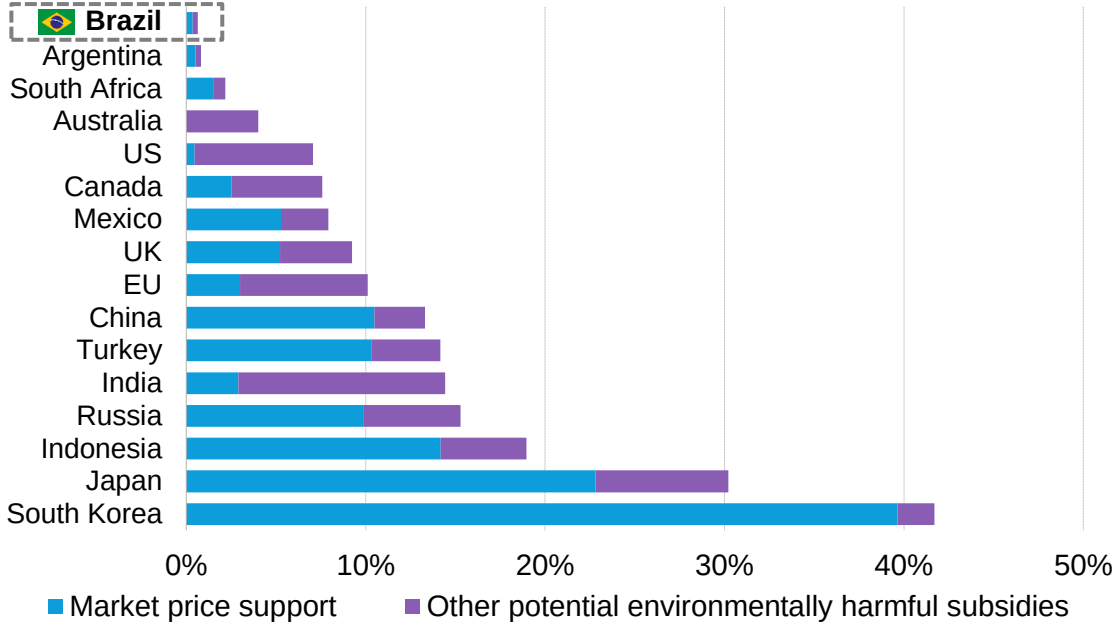
Brazil has the fewest harmful agriculture subsidies among G-20 members

Potentially harmful agricultural subsidies in 2022 relative to total value of production



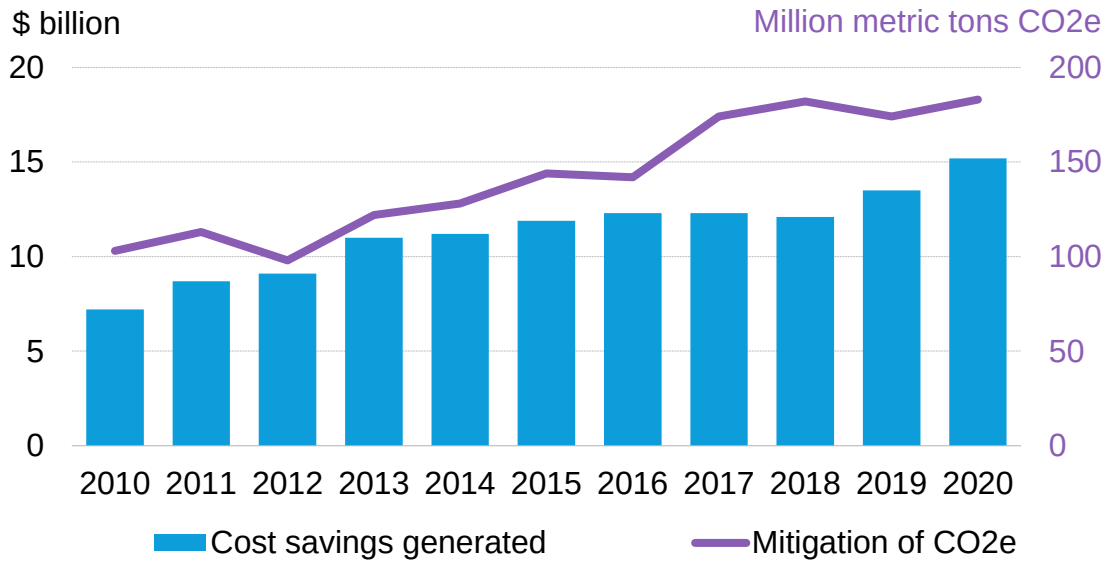
The Organisation for Economic Co-operation and Development (OECD) has defined environmentally harmful agricultural subsidies as those that distort prices and producers' resource allocation, negatively impacting economies and the environment. Such subsidies can lead to overexploitation of natural resources, accelerate biodiversity loss and climate change, and exacerbate income inequality.

The G-20 provided $528 billion in agricultural subsidies that were potentially harmful to the environment in 2022, representing about 64% of its total support.

Source: BloombergNEF's G-20 Risks More Harm Than Good With Agricultural Subsidies, OECD. Note: Market price support in this chart only counts positive market price support. The OECD dataset used does not include Saudi Arabia due to data availability issues. France, Germany and Italy are included in the EU category.

Biologicals are a success story for Brazilian agriculture

Cost savings and emissions mitigated from use of biological inoculants in Brazilian soybean



Brazil's long-term policy, which offers subsidized credit for low-emissions practices, presents promising results.

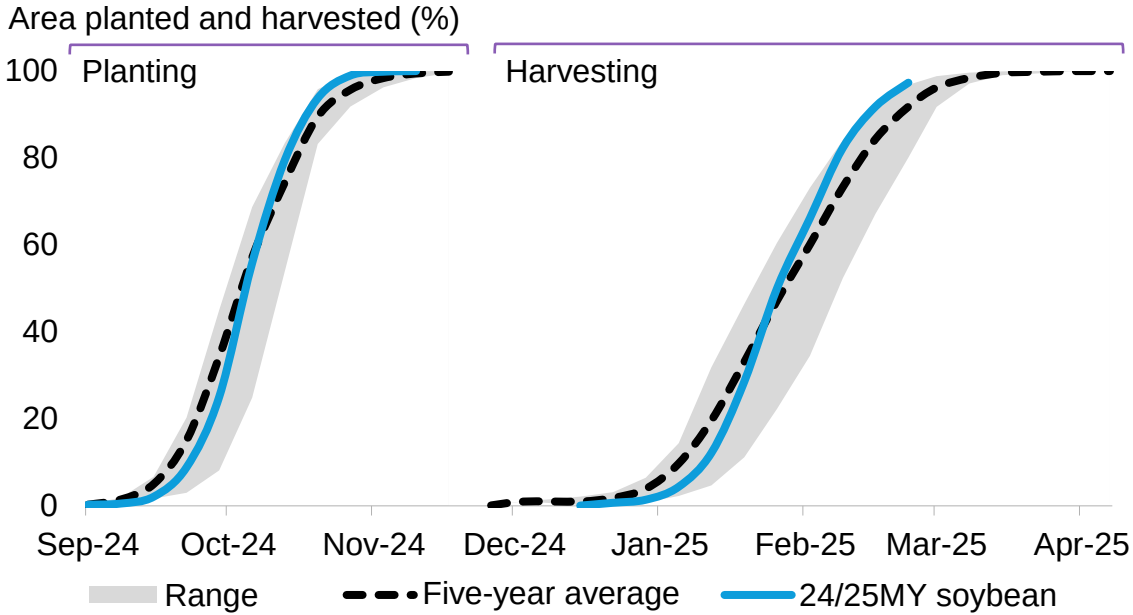
For instance, the increased use of biologicals in the country has boosted soil nitrogen availability for soybeans. As a result, Brazilian farmers have been able to reduce the volume of fertilizer used, cutting both input costs and nitrous oxide emissions.

Brazil's biologicals market grew 15% in the 2023-24 cropping season – four times the global average rate.

Source: The Brazilian Agricultural Research Corporation, BloombergNEF. Note: The Brazilian Agricultural Research Corporation, or Embrapa, is the enabling body behind the country's rapid deployment of these crop inputs. Dates used are fiscal year and range from different year. CO2e refers to CO2 equivalent.

Biofuel mandates, trade tensions and weather put Brazil's soy production under pressure

Mato Grosso soybean planting and harvesting rates



Brazil's Fuel of the Future bill mandates increasing biodiesel blends to 15%. Yet soybeans, which contribute to 69% of Brazil's biodiesel outputs, are already facing strained supplies.

Despite record estimates of production for Brazilian soybeans in 2025, weather delayed the planting and harvest season by 30-40% in Mato Grosso, which supplies 28% of the country's soybean production. At the same time, trade tensions with the US have led China to boost soybean imports from Brazil, which could threaten feedstock allocation to biofuels.

Source: BloombergNEF, United States Department of Agriculture, Companhia Nacional de Abastecimento. Note: MY refers to market year.

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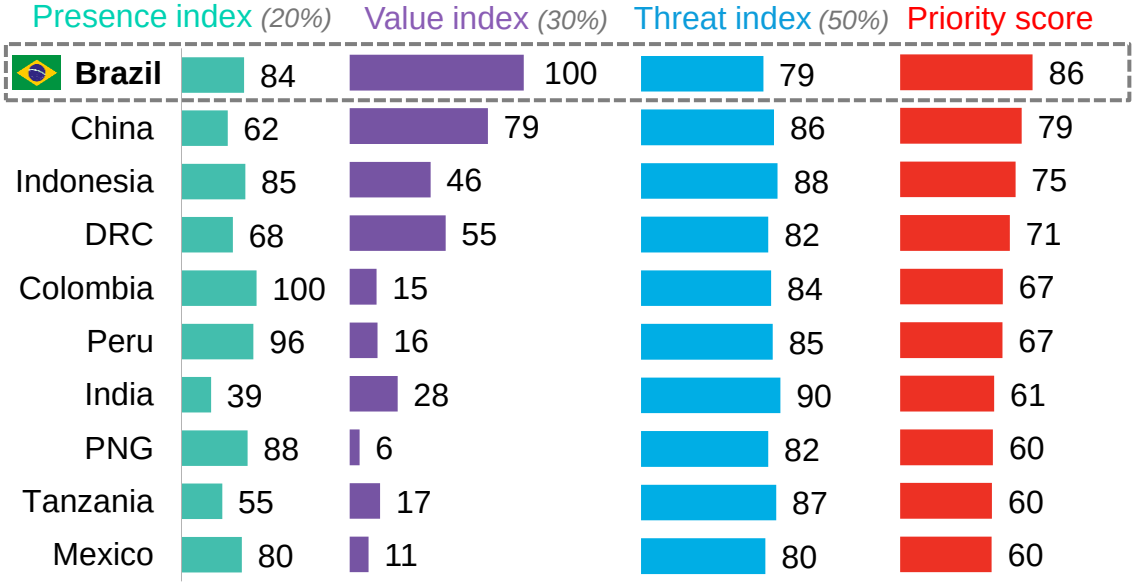
Land-use change is threatening Brazil's biodiversity, which BNEF has identified as a top priority for protection

Top 10 BloombergNEF biodiversity funding priorities, 2024



The BNEF biodiversity priority score is based on the presence of biodiversity, the value of ecosystem services provided by nature, and degree to which these resources face threats.

Despite having the highest overall priority score in BNEF's index, Brazil's 'presence index' – which measures both presence of biodiversity and its intactness – has been decreasing, as habitat fragmentation threatens the country's abundance of native species.

Source: BloombergNEF's Biodiversity Finance Factbook, Convention on Biological Diversity (CBD). Note: DRC stands for Democratic Republic of Congo and PNG stands for Papua New Guinea. Priority score refers to weighted average of 'presence', 'value' and 'threat' indexes. Weights in grey. 'Presence' indicates species richness, endemism or rarity; 'value' reflects ecosystem services, and whether or not these are commercialized; 'threat' indicates the level of risk faced by species or habitat, and local authorities' ability to respond.

Carbon markets

Energy scenarios

Clean power

Decarbonizing transport

Decarbonizing industry

Energy transition metals

Sustainable finance

Agriculture and biodiversity

Carbon markets

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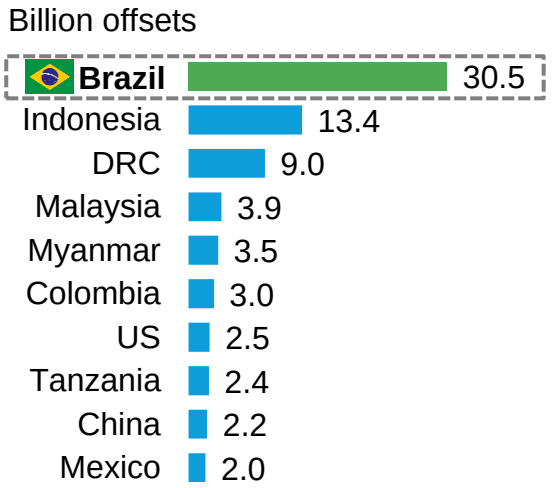
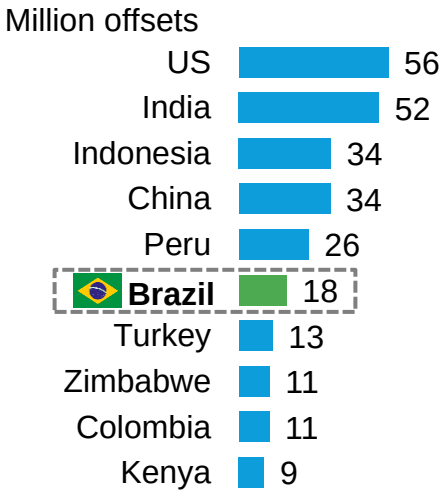
Brazil is the top country for nature-based offsets but has yet to reach its full climate mitigation potential

Top suppliers of nature-based offsets, 2024-2050



Retired offsets by market, 2016-2024



BNEF estimates that some 75% of the abatement in Brazil out to 2050, could come from REDD+, followed by reforestation at 23% and sustainable agriculture practices at 2%.

Brazil will need to pivot significantly to reach this potential: the country issued offsets for a record 25.4 million metric tons of CO2 equivalent in 2021, but supply plummeted to 5.6MtCO2e in 2023. Issuance has historically been top-heavy, coming from a handful of large REDD+ projects with inconsistent quality.

Source: BloombergNEF, VCS, GS, CAR, ACR, Nature4Climate. Notes: One offset = 1 metric ton of CO2 equivalent. REDD+ refers to Reducing Emissions from Deforestation and forest Degradation in developing countries. DRC is Democratic Republic of Congo. Retired offsets numbers are based on data made available on the four largest public carbon offset registries – Verra (VCS), Gold Standard (GS), American Carbon Registry (ACR), and Climate Action Reserve (CAR) – and may not be fully representative of the entire voluntary carbon offset market – for example they exclude bilateral off-take agreements. Charts only display retirements tied to specific projects on each registry. Data through September 16, 2024.

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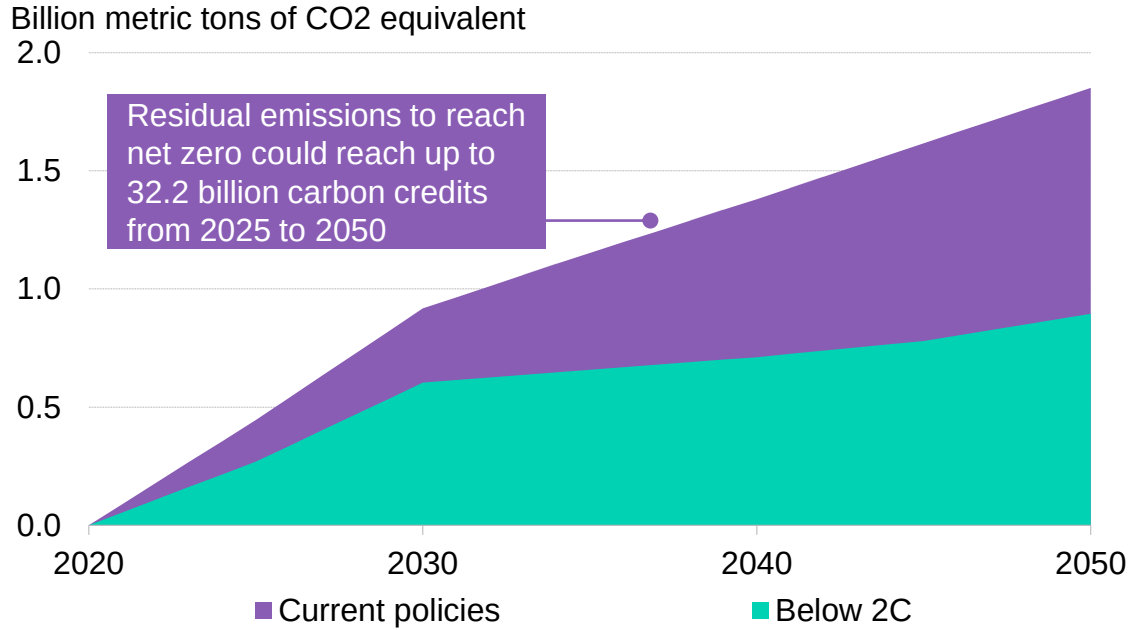
The country may still be a net importer of credits if it fails to cut domestic emissions

Brazil's residual emissions of 'Current policies' and 'Below 2C' scenarios



Brazil will host efforts to develop a global carbon market at COP30; it also has its own domestic carbon market in the works.

The country's abundant natural resources allow it to produce huge numbers of carbon offsets. Yet whether or not it will need to use these offsets domestically or can sell them to other countries will depend on how aggressively it can reduce its emissions at home.

Brazil has pledged to achieve net-zero emissions by 2050. Without a more ambitious climate policy, Brazil will need all of its abatement potential just to meet its own net-zero goals.

Source: BloombergNEF, ClimateWatch.

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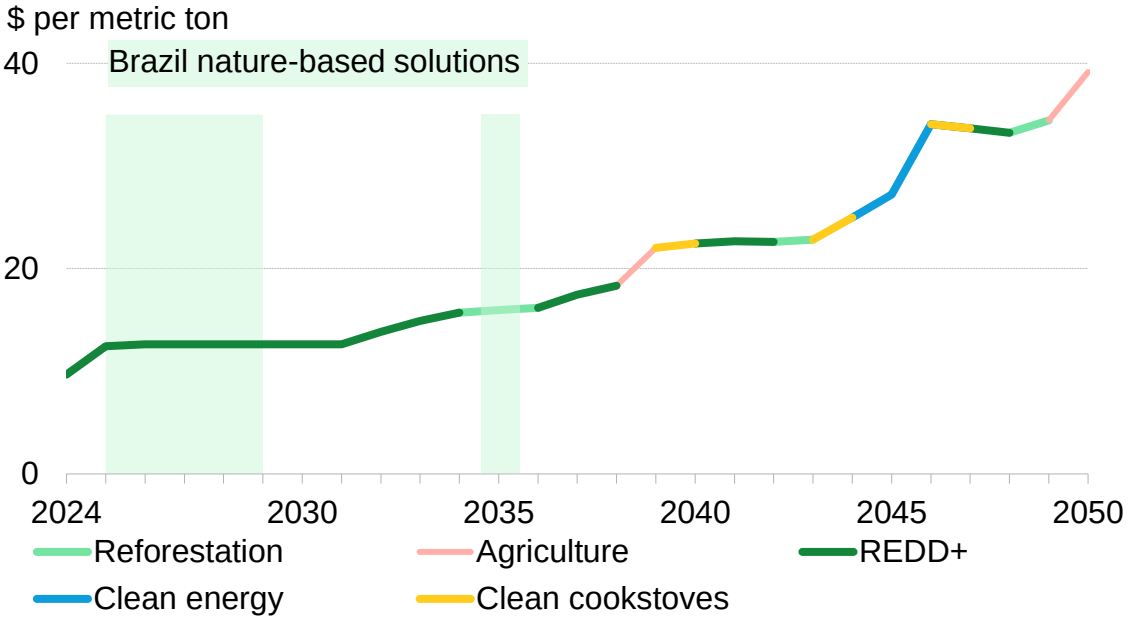
A healthy Brazilian offset market could influence global pricing

Marginal carbon offset prices – voluntary market scenario



Brazil is poised to set global prices for carbon credits in future years, should it make the necessary investments into building an inventory of projects.

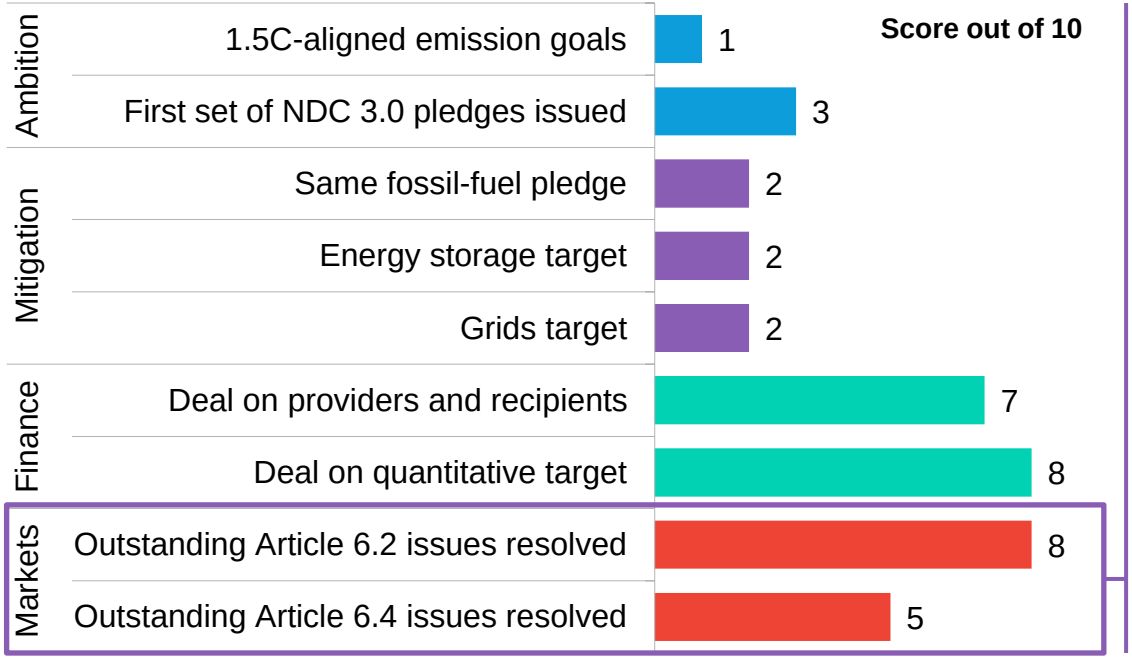
BNEF estimates the marginal price of carbon credits could be set by Brazilian REDD+ projects at $13 per metric ton over 2025-2030 and $16 per ton in 2035.

The dominance of Brazilian nature-based offsets means that changes to cost, supply or demand in the country could have ramifications on global demand and prices. This is not dissimilar from OPEC's influence in global oil markets.

Source: BloombergNEF's Brazil Holds Key to Unlocking the Voluntary Carbon Market. Note: Chart is colored by the sector setting marginal prices in each year. REDD+ refers to avoided deforestation.

Carbon markets will likely be a hot topic at COP30, following COP29 advancements

Progress toward Paris Agreement goals achieved at COP29

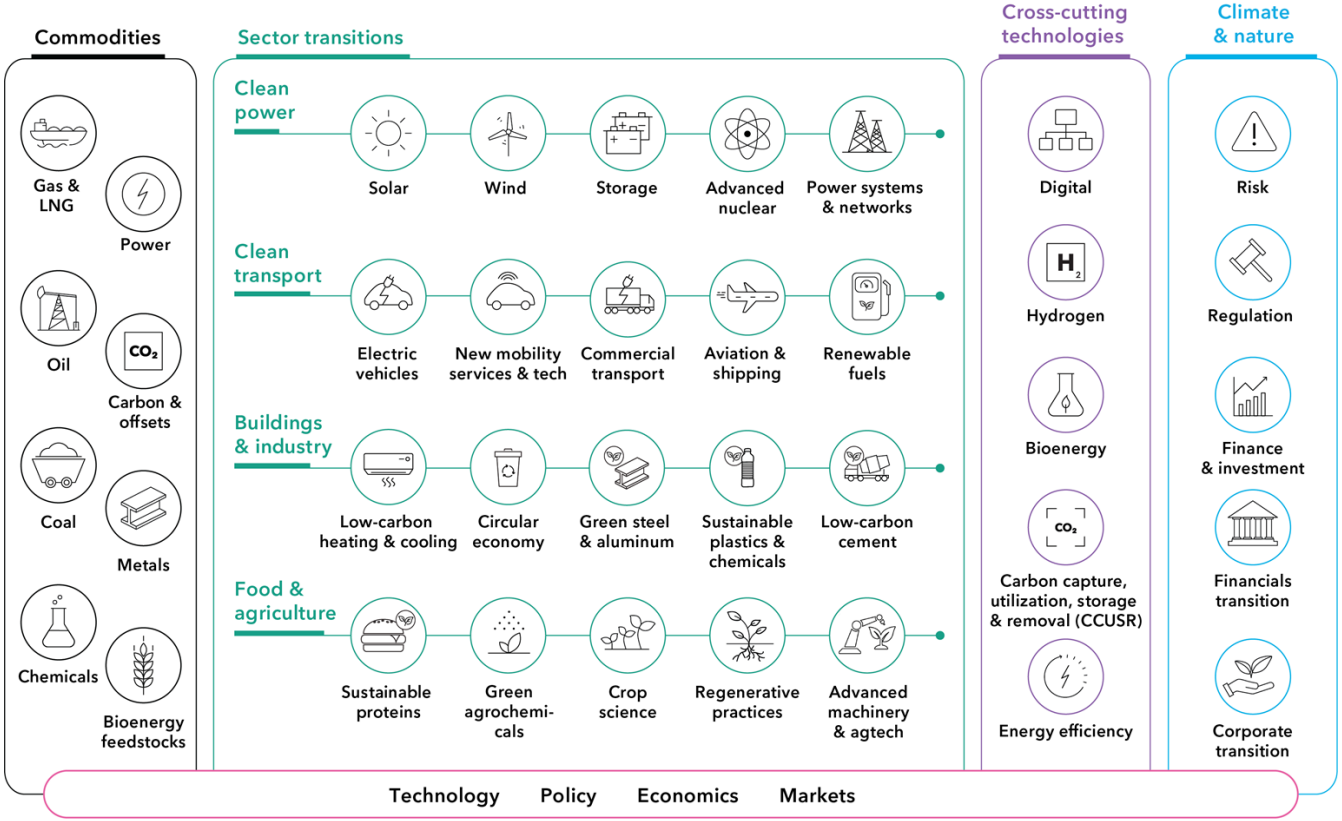


Major progress has been made on Article 6.2 of the Paris Agreement, which covers emission-reduction trading at a country level. Consensus was reached on the reporting and authorization processes last year at COP29, which has enabled countries to trade carbon credits, but a central registry has yet to be finalized.

Article 6.4, the global crediting mechanism, is not currently active. The control body must still resolve a list of outstanding technical issues, but it is hoped that COP30 can get the mechanism up and running.

Source: BloombergNEF's COP29 Makes Headway on Finance But Fails on Fossil Fuels. Note: NDC 3.0s are the next Nationally Determined Contributions.

BNEF coverage



Founded in 2004, BNEF is a strategic research provider covering **global commodity markets** and the **disruptive technologies** driving the transition to a **low carbon economy.**

Our expert coverage assesses pathways for the **power, transport, industry, buildings, and agriculture** sectors to adapt to the energy transition.

We help **commodity trading, corporate strategy, finance, and policy professionals** navigate change and generate opportunities.

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