

An aerial photograph of a coastal city, likely Rio de Janeiro, showing a large body of water in the foreground and a densely built-up urban area on the right. The water is a deep green color, and the city features a mix of residential and commercial buildings, roads, and green spaces. The overall scene is captured from a high angle, providing a comprehensive view of the coastal landscape.

BloombergNEF

CLIMATESCOPE 2021

Energy Transition Factbook

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Executive summary

This marks the 10th anniversary of Climatescope, BNEF's annual assessment of energy transition opportunities. For the first time, the project has expanded its scope to include activity not just in clean power but in the decarbonization of the transportation and buildings sectors. Climatescope represents the collective effort of over 40 BNEF analysts who gather detailed data on 136 markets globally, including 107 emerging markets and 29 developed nations.

In 2020, emerging markets continued to lead the global energy transition. No less than 70% of all new renewable power capacity built occurred in these jurisdictions. While deployment of electric vehicles and electric heat pumps remains small, wind and solar are the lowest-cost option for new generation in most of these quickly growing economies.

Covid-19 in 2020 did not dampen investor enthusiasm globally for the energy transition as total capital deployed hit yet another high. The pandemic did appear to prompt investors to focus on traditionally lower-risk nations, however. Energy transition capital deployed in emerging markets dropped 10% year-on-year. For the first time since 2018, these jurisdictions accounted for the minority of total energy transition funds deployed. Given the large and growing CO2 footprints of these markets, the investment dip represents a worrying trend.

43%

Share of 2020 global energy transition investment that went to emerging markets

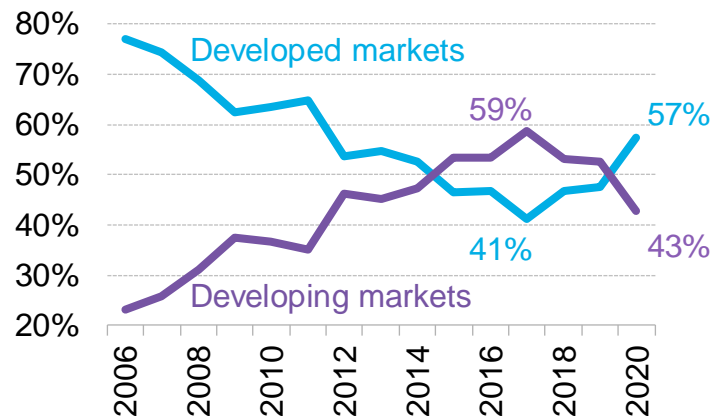
-10%

The 2019-2020 change in energy transition flows to these markets

89%

Share of global emissions covered by a net-zero target in force or under discussion

Energy transition asset finance by market group



Source: BloombergNEF

Executive summary (2)

Global energy transition investment jumped in 2020, despite the pandemic, but investors' attention shifted to developed markets.

- The Covid-19 pandemic disrupted investment into developing nations as investors shifted to lower-risk markets. In 2020, wealthier nations accounted for 57% of asset finance for renewables, electrified transport and electrified heating, or \$262 billion, up from 41% of the total in 2017. With \$195 billion, emerging markets accounted for 43% of the total, down from 53% in 2019 and a peak of 59% in 2017.
- The energy transition investment gap between wealthy and less developed nations is growing, despite COP26 promises. In 2020, developed nations recorded over 12 times more investment per MtCO₂e emissions from the energy sector than emerging markets, compared to seven times more in 2019. While wealthier nations attracted \$53 million for each MtCO₂e emissions from the energy sectors, developing markets received just \$4.3 million.

Energy transition progress has been unequal between developed and developing nations.

- Many developing nations have substantial track records of deploying clean power technologies such as wind and solar. But far fewer have begun to contemplate how to decarbonize their transportation and buildings sectors. Given the high costs of deploying lower-carbon solutions such as electric vehicles or electric heat pumps, this is understandable. But further action will be needed to reach net zero.
- Global power generation stayed flat in 2020. Generation totaled 25.83TWh in 2020, down 0.2% from 2019. At the height of the pandemic, it appeared generation would drop sharply in 2020. Instead, steady growth in upper middle-income countries, led by China, contributed to higher-than-expected generation in 2020.
- Lockdowns impacted the power sector of developed and developing nations differently. Generation in developing (non-OECD) nations continued to rise in 2020 despite the pandemic, but slipped in wealthier (OECD) countries. Non-OECD generation demand inched up 1% though that was far below the 7% growth rate projected under BNEF's 2019 New Energy Outlook, published before the pandemic. In OECD nations, demand dropped 2% in absolute terms from 2019. BNEF had expected demand in these nations to grow 3% year-on-year.

Executive summary (3)

While many countries have adopted “net-zero” CO2 goals, far fewer have followed through with sector-specific policies to hit targets.

- 89% of global emissions are now covered by a net-zero target in force or under discussion. This contrasts with 80% on the day before the Glasgow summit began, and just a third in January 2020. Countries responsible for nearly two-thirds of global greenhouse-gas emissions have a net-zero target in force. A further 27% have such a goal under discussion.
- The share of emerging markets with targets in force jumped from 67% in 2019 to 82% in 2021, but implementation of other mechanisms has been weak. The share of developing nations with reverse auction schemes for clean power delivery contracts or with feed-in tariffs in force has remained flat compared to 2019. Over the past three years, less than half the emerging markets surveyed had auctions in force; approximately a quarter had feed-in tariff mechanisms in place.
- Lack of policies limit EV uptake in emerging markets. Relatively few emerging markets have clean transport policies in force. While 93% of the developed nations surveyed by Climatescope have clean transport targets, just 22% of the emerging markets analyzed do.
- Three quarters of the policies to facilitate decarbonization of heating in buildings that Climatescope tracked in 2021 were on the books in wealthier countries. As in transport, lack of incentives have limited investment and activity in this area in emerging markets.

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About Climatescope

2021 marks the tenth year of Climatescope. The project has significantly evolved over a decade and expanded to new markets and sectors (*see global-climatescope.org/about for more details about how Climatescope has evolved*).

Climatescope is a unique market assessment, interactive report and index that evaluates the conditions for energy transition investment globally and evaluates their ability to attract capital for low-carbon technologies while building a greener economy. It also provides a snapshot of where clean energy policy and finance stand today and a guide to what can happen in the future. This year, BNEF gathered detailed information on 136 markets globally, or 107 emerging markets and 29 developed nations. Climatescope 2021 also expanded from a power focus, to a wider energy transition scope, including power, transport and buildings.

Climatescope encompasses nearly every nation in the world with over 2 million inhabitants*. Developed markets are defined as OECD countries minus Chile, Colombia, Costa Rica, Mexico and Turkey. These five are part of the OECD, but remain attractive emerging markets for clean energy development. Developing markets include all non-OECD nations, plus these five countries.

This report summarizes the research undertaken by over 40 BNEF analysts compiling detailed data on Climatescope markets. Readers are encouraged to explore complete rankings, datasets, tools and country profiles on the [Climatescope website](https://climatescope.org) to leverage fully this deep-dive into how the countries surveyed are driving the energy transition.

**Note: Afghanistan, Cuba, Iran, North Korea, Yemen and Libya are not in the coverage due to local conflicts or international sanctions that make them particularly challenging to research.*

An aerial photograph of a coastal region. On the right side, a dense urban grid with various buildings and green spaces is visible. A winding waterway or canal separates the city from a large, dark green body of water that occupies the left and center of the image. The water shows some lighter green patches, possibly indicating algae or sediment. The overall tone is a mix of natural green and urban grey.

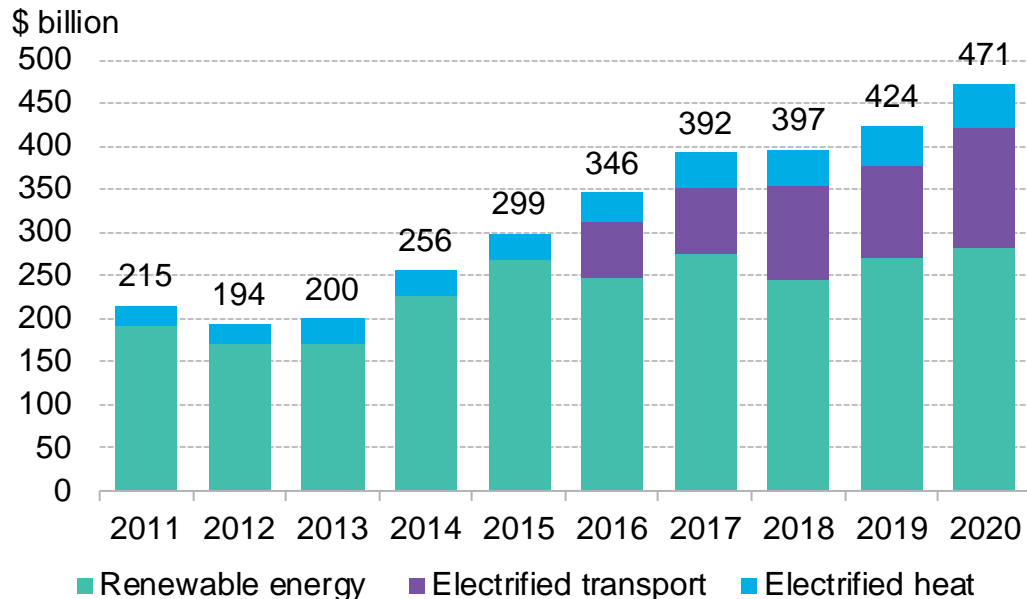
BloombergNEF

01. **Investment**

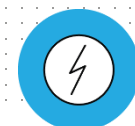
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Global energy transition investment jumped, despite the pandemic...

Energy transition asset finance by sector



Source: BloombergNEF



Power



Transport



Buildings

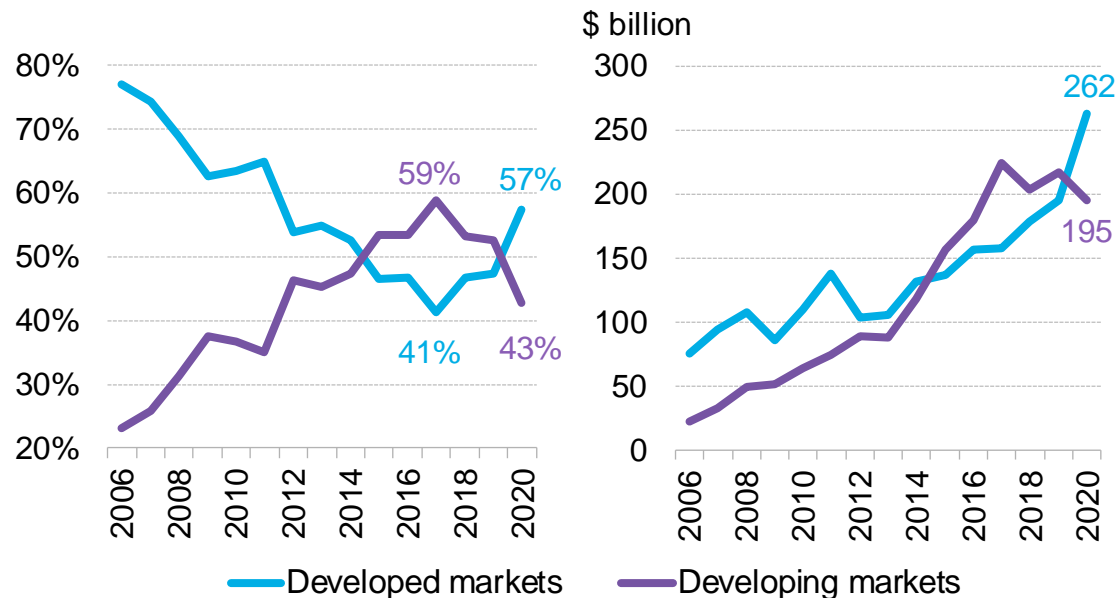
Asset financing – the funding of projects and infrastructure – for renewable energy, electrified transport and electrified heat hit \$471 billion in 2020. This was up 11% from 2019. Annual volumes have more than doubled since 2013.

Renewables accounted for 60% of the total, but investment into those technologies – wind and solar, mostly – has remained mostly flat for six years. Asset finance for electrified transport reached nearly \$140 billion in 2020, or 29% of the total, up from just \$65 billion four years earlier. Electrified heat funding topped \$50 billion, up from \$45 billion in 2019.

China, the U.S. and Germany accounted for over half of 2020 investment. China (\$144 billion) was nearly a third of the total. The U.S. (\$79 billion) followed at 17%, down from \$84 billion in 2019. Germany (\$27 billion) was 6% of the total.

...but investors' attention shifted to developed markets

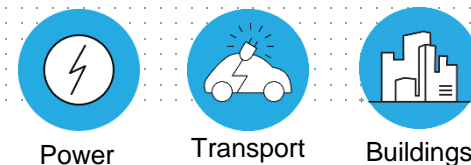
Energy transition asset finance by market group



The Covid-19 pandemic disrupted investment into developing nations as investors shifted to lower-risk markets. In 2020, wealthier nations accounted for 57% of asset finance for renewables, electrified transport and electrified heating, or \$262 billion, up from 41% in 2017. With \$195 billion, emerging markets accounted for 43% of the total, down from 53% in 2019 and a peak of 59% in 2017.

Energy transition asset finance plummeted 10% 2019-2020 in emerging markets, but jumped 34% in developed countries. Richer nations saw asset finance levels nearly double 2015-2020, from \$136 billion to \$262 billion.

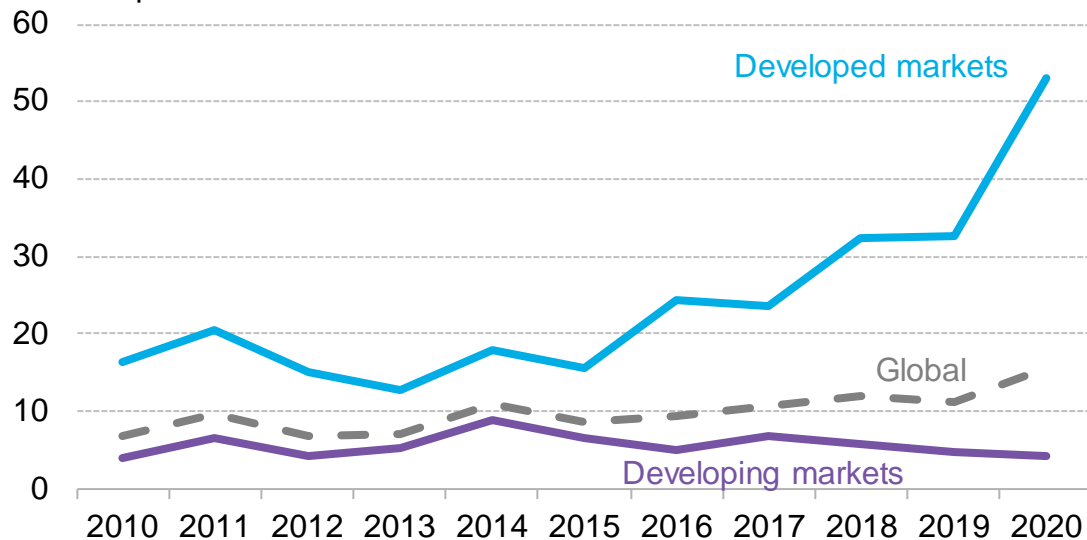
Source: BloombergNEF. Note: data includes asset finance for renewable energy, electrified transport and electrified heat. It does not include investment to undisclosed countries, which represented \$14 billion in 2020. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other economies.



The energy transition investment gap is growing, despite COP26 pledges

Energy transition investment by energy sector emissions

\$ million per MtCO₂e



Energy transition investment inequality is widening between developed and developing nations, highlighting the need for expanded international support. Developing nations account for two-thirds of the global energy sector emissions, but recent investment levels are far from sufficient to put them on a sufficient decarbonization pathway.

In 2020, developed nations recorded over 12 times more investment per MtCO₂e emissions from the energy sector than emerging markets, compared to seven times more in 2019. While wealthier nations attracted \$53 million for each MtCO₂e emissions from the energy sectors, developing markets received just \$4.3 million.

Source BloombergNEF, CAITT. Note: annual investment data divided by 2018 emissions. Data includes asset finance for renewable energy, electrified transport and electrified heat. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey.



Power



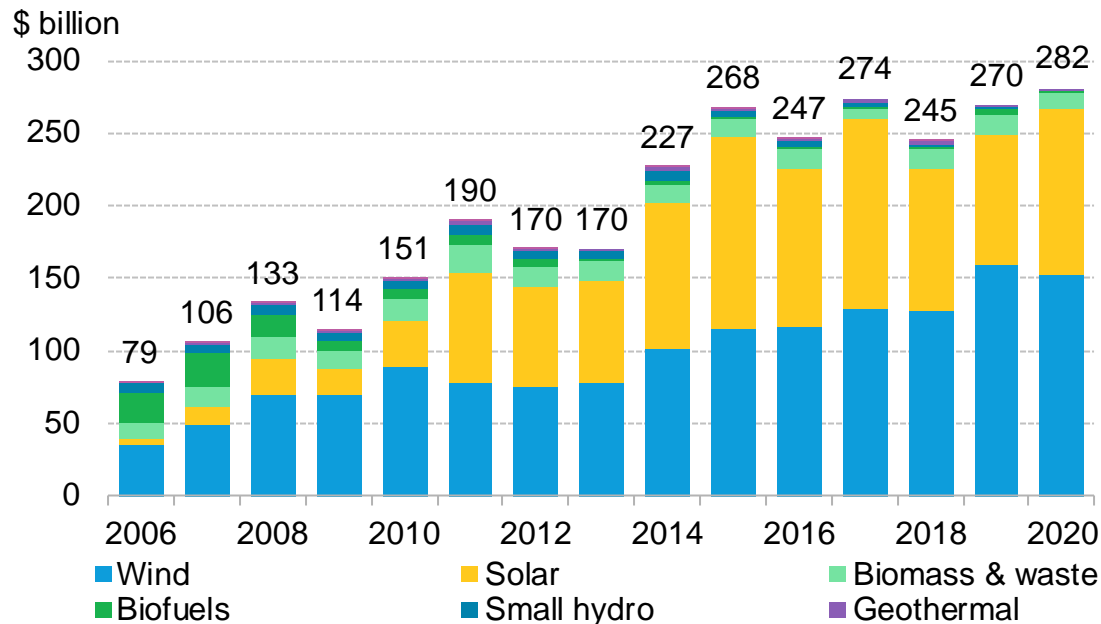
Transport



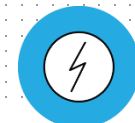
Buildings

Global renewable energy asset finance inched up 4% in 2020

Global new-build renewable energy asset finance by sector



Source: BloombergNEF



Power



Transport



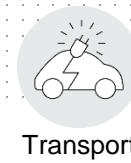
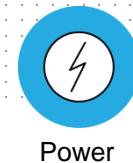
Buildings

Asset finance for renewable energy projects rose 4.4% in 2020 from the year prior, but investment in such projects has remained more or less level over the past five years.

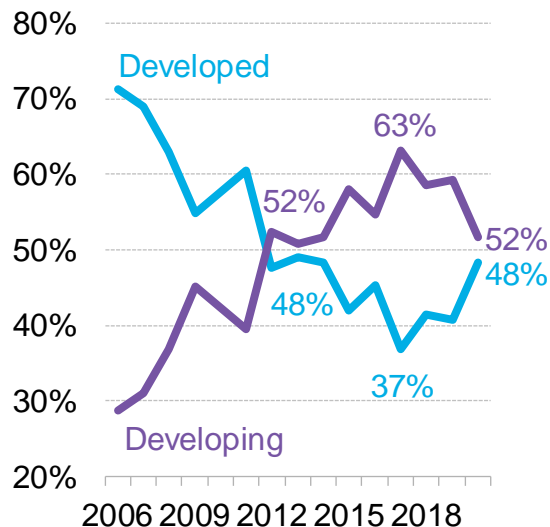
The average annual growth rate since 2015-2016 has been 1.4%, compared to more than 13% during the first half of the decade. However, as clean energy equipment prices plummet, stable investment levels actually reflect more capacity getting built (see section [Progress section](#) for more details).

Wind and solar represented 95% of the renewable energy investment received globally in 2020. Wind accounted for 54% of the total with \$153 billion, while solar received 41%, or \$114 billion.

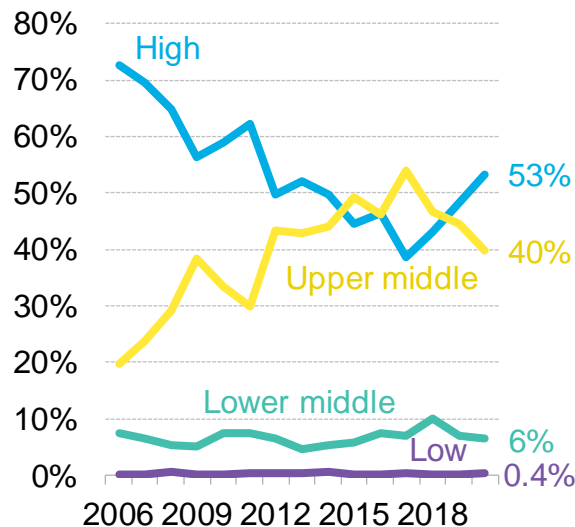
Renewables investment shifted sharply back to developing nations in 2020



Renewable energy asset finance by market group



Renewable energy asset finance by income levels

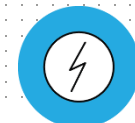


The share of renewable energy investment directed to developing nations plummeted to 52% in 2020 – the lowest level since 2014. This was down from 59% in 2019 and a peak of 63% in 2017. Emerging markets account for nearly two-thirds of the global energy sector emissions and have been recording the majority of renewable energy investment since 2014. But the abrupt shift highlights that international support for emerging markets will be pivotal to ensure a successful global race to zero.

“High” and “upper middle income” designated countries accounted for 93% of renewable energy investment in 2020. Lower middle income” countries, including Vietnam, Morocco and Philippines, accounted for just 6.5%, while “low income” countries, including Uganda, Ethiopia, Guatemala, and many more received just 0.4% of the total.

Source: BloombergNEF. Note: data includes asset finance for new-build clean energy projects. It does not include investment to undisclosed countries. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other economies. Income level groups from the World Bank.

Renewable energy investment jumped 24% in rich nations, but plummeted 9% in emerging markets



Power

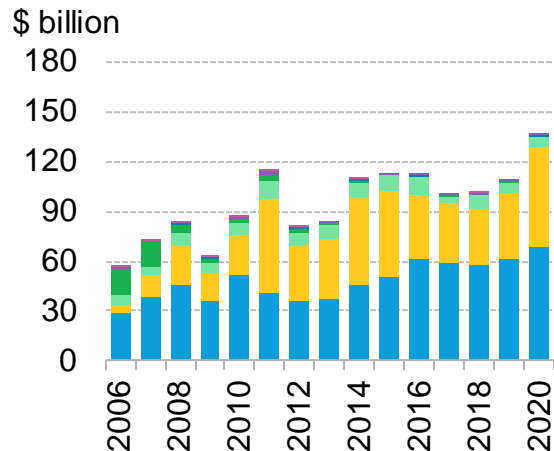


Transport

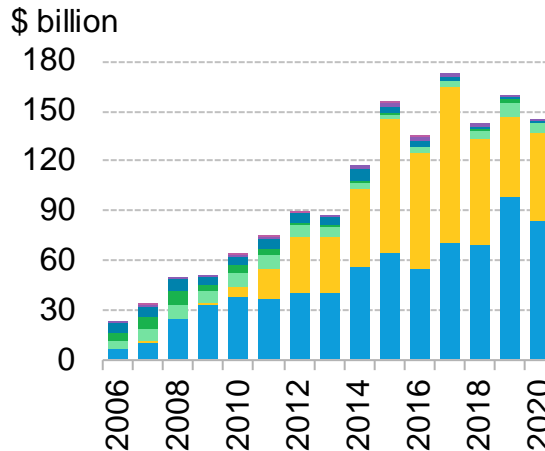


Buildings

Renewable energy asset finance in developed markets



Renewable energy asset finance in developing markets



■ Wind ■ Solar ■ Biomass & waste ■ Biofuels ■ Small hydro ■ Geothermal ■ Marine

Source: BloombergNEF. Note: Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. It does not include investment to undisclosed countries. Developing markets include all other economies.

While developed nations saw asset finance for renewable energy projects jump 24%, from \$109 billion in 2019 to \$136 billion in 2020, emerging markets saw levels fall 9%, from \$159 billion to \$145 billion. Investment remains 7% higher in developing nations, but the gap is far smaller than in previous years.

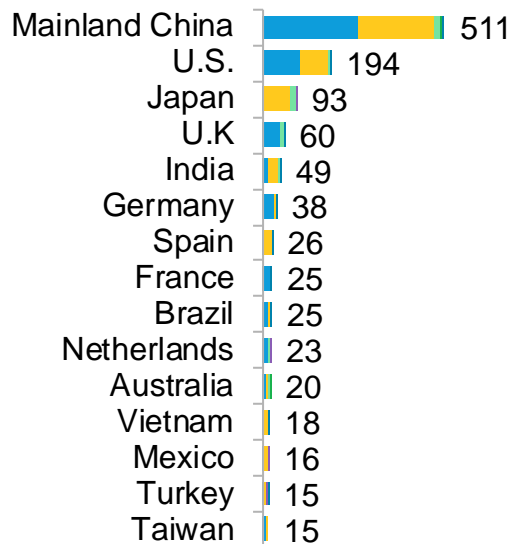
Wind is the main technology for renewable energy investment in both developed and developing markets, with 51% and 58% of the total, respectively. Solar follows with 44% of the total in developed nations and 37% in emerging markets.

15 countries accounted for 88% of 2020 global renewable energy investment

Top 15 markets for renewable energy asset finance

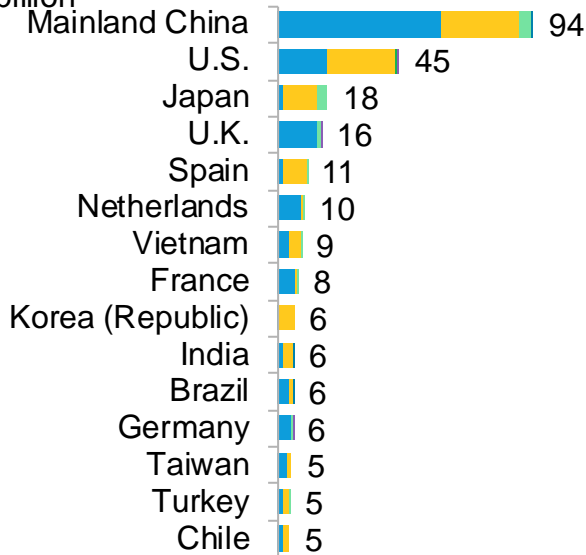
2016-2020

\$ billion



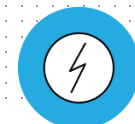
2020

\$ billion



■ Wind ■ Solar ■ Biomass & waste ■ Biofuels ■ Geothermal ■ Small hydro

Source: BloombergNEF



Power



Transport



Buildings

Renewable energy investment remains highly concentrated in a relatively small number of markets.

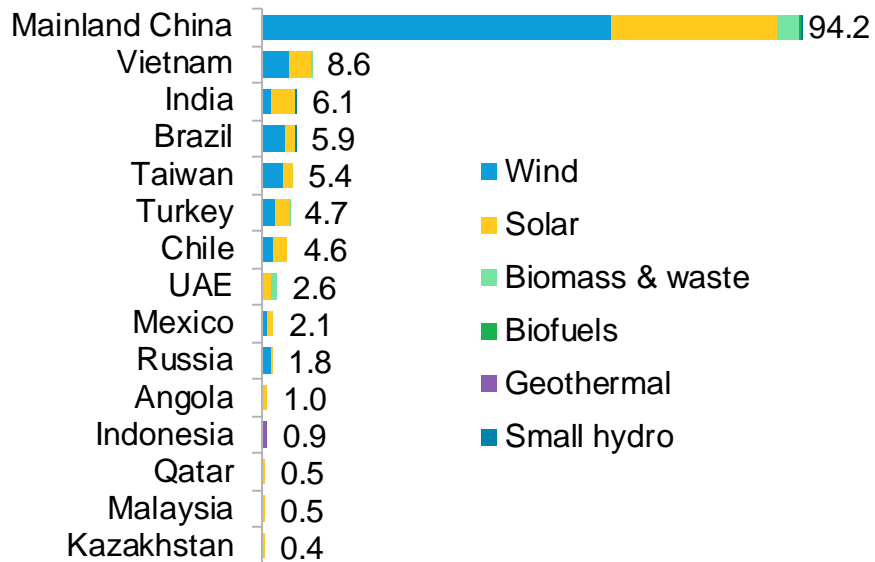
In 2020, the top 15 markets for new-build asset finance for renewable energy projects attracted \$248 billion, or 88% of all investment globally. China alone accounted for a third of the total, followed by the U.S. with 16% and Japan with 6%.

China, the U.S. and Japan accounted for 60% of the \$1.3 trillion that went into renewables projects from 2016-2020. With \$511 billion over the period, China accounted for nearly 40% for the total.

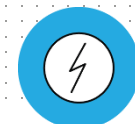
China accounts for 2/3 of emerging markets' renewable energy investment

Top 15 markets for renewable energy asset finance, 2020

\$ billion



Source: BloombergNEF



Power



Transport



Buildings

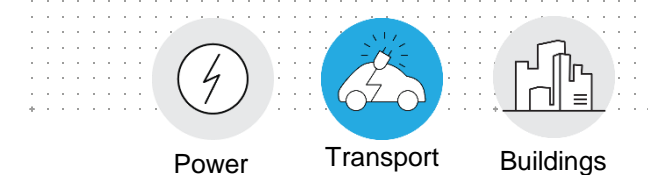
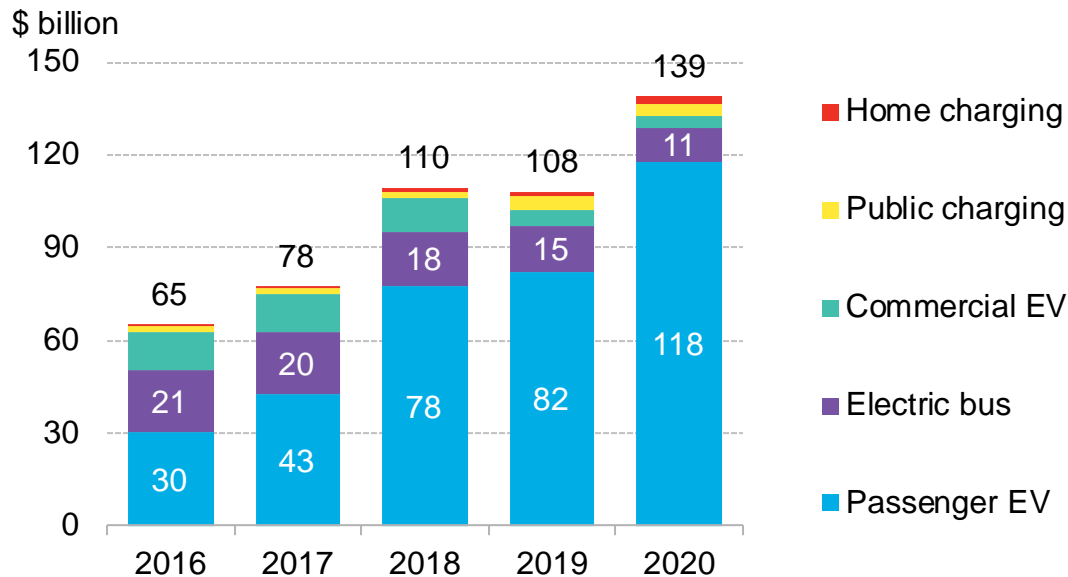
Among emerging markets, clean energy financing is even more concentrated in a small number of nations with 15 countries accounting for 96% of 2020 investment. China attracted no less than two-thirds of developing market 2020 renewable energy investment, although the country saw financings drop 7% from 2019.

Vietnam, Turkey and Indonesia all recorded spikes in investment in 2020. Vietnam saw investment jump more than three-fold, from \$2.6 billion in 2019 to \$8.6 billion in 2020. In Turkey, investment more than doubled from \$2.1 billion to \$4.7 billion, while Indonesia saw investment almost quadruple after two years of significant drops. Angola and Qatar saw their first significant renewable energy investment flows with \$1 billion and \$0.5 billion attracted in 2020, respectively.

Investment plummeted in India, the UAE and Mexico in 2020. India recorded the lowest investment level since 2013 with \$6.1 billion. The country is typically the second biggest nation for renewables investment, but slipped to third in 2020. The UAE and Mexico saw investment fall by nearly half in 2019-2020.

Clean transport investment reached \$500 billion in 2016-2020

Global investment into clean road transport vehicles and infrastructure



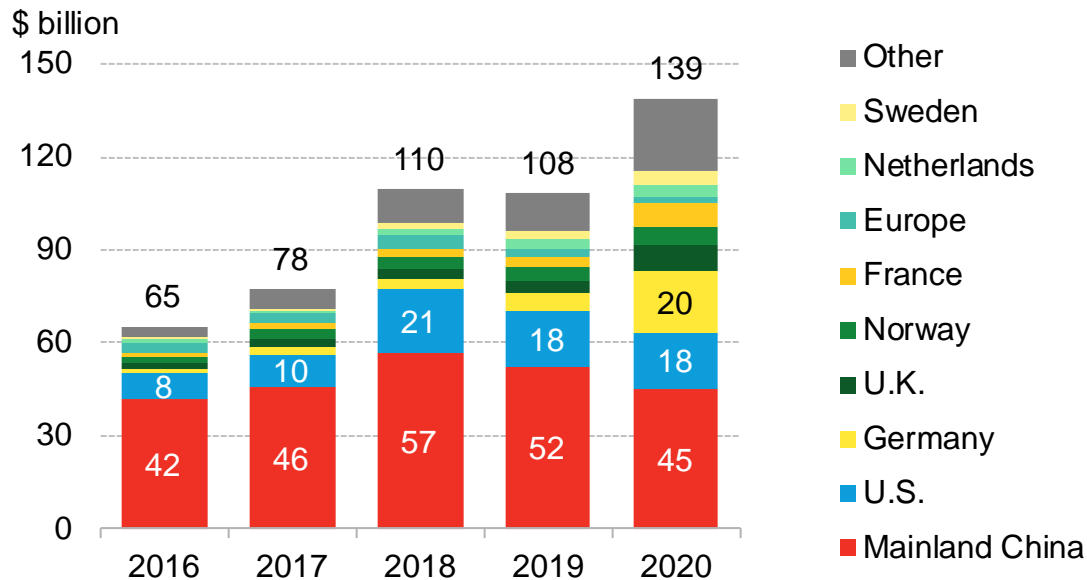
Global asset finance for clean road vehicles and infrastructure totaled \$500 billion in 2016-2020. In 2020 alone, the sector attracted \$139 billion, up 28% from the previous year and 112% up from 2016.

Investment into passenger electric vehicles (EV) accounted for 70% of the total over the past five years and 85% in 2020. This is also the fastest growing segment of clean transport investment, with a four-fold growth in five years and a 43% jump from 2019-2020. Electric bus sales were the second biggest segment for clean road transport investment. However, investment in busses has not risen consistently. Funding totaled \$21 billion in 2016 and \$11 billion in 2020.

Source: BloombergNEF. Note: includes passenger and commercial vehicles, buses, public and home charging and hydrogen refuelling. BEVs, PHEVs, FCVs.

China accounted for half of global clean transport investment

Global investment into clean road transport vehicles and infrastructure by country



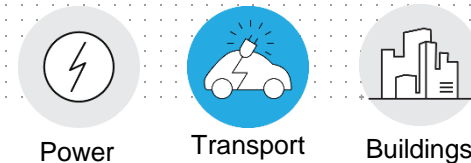
China attracted \$242 billion in clean transport investment from 2016-2020, nearly half the global total.

Still, asset finance in the sector has been declining since a peak of \$57 billion in 2018.

Although passenger EV sales represent most of the clean transport investment in China, the country also accounts for 96% of global electric bus investment.

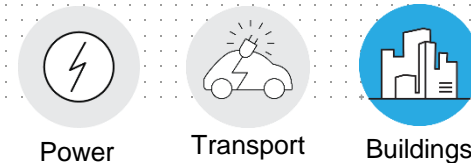
Germany and the U.S. followed with \$20 billion and \$18 billion in clean transport investment in 2020. In Germany, investment tripled from less than \$6 billion in 2019 to nearly \$20 billion in 2020.

Clean transport investment remains exclusive to richer nations. High and upper middle income countries attracted no less than 99.9% of the global clean transport investment 2016-2020.

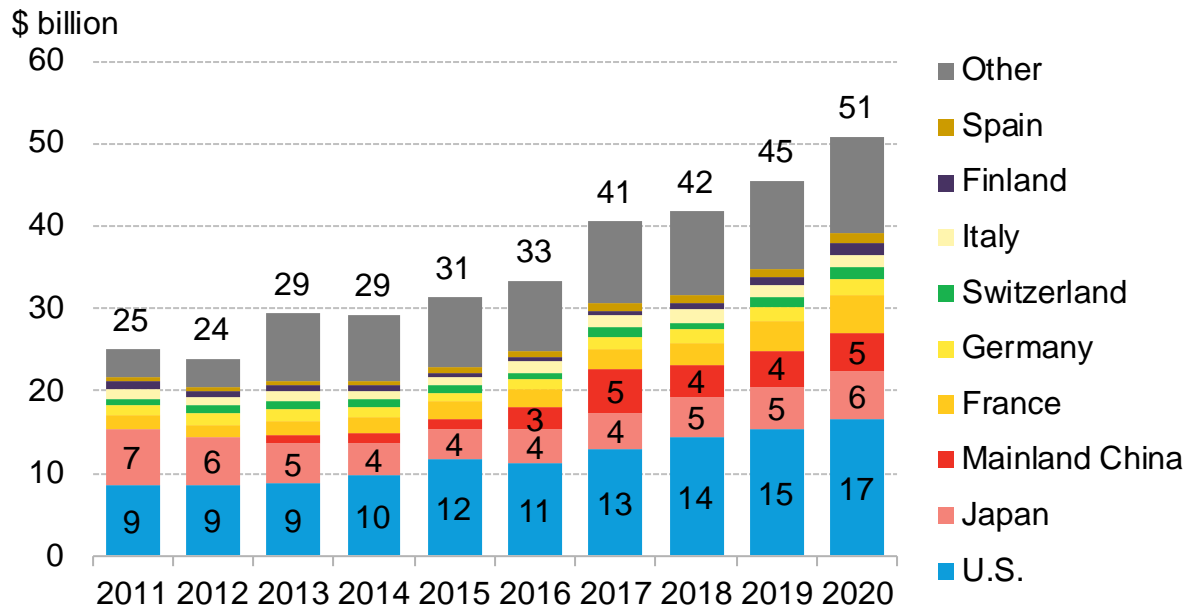


Source: BloombergNEF. Note: includes passenger and commercial vehicles, buses, public and home charging and hydrogen refuelling. BEVs, PHEVs, FCVs

Three countries attracted over half of global electrified heat investment



Global investment in electrified heat



The U.S., Japan and China alone accounted for over half of global investment in electrified heat. Together, these countries attracted 55% of global investment over the past decade, and 53% in 2020 investment. The U.S. is the only major market for electrified heat that has seen investment grow every year over the past decade.

Global investment has doubled over the past decade. Capital flows to electrified installations and companies grew at an average rate of 7% per year and jumped 9% from 2019-2020.

Source: BloombergNEF

A satellite image of a coastal region. On the right side, there is a densely populated urban area with a grid-like street pattern, interspersed with green fields and some industrial or commercial buildings. To the left of the city, a large body of water, possibly a bay or a large river, dominates the scene. The water has a dark green, almost black, hue, suggesting depth or perhaps a specific type of algae. There are some lighter, brownish-green patches in the water, possibly indicating sediment or different water depths. The coastline is irregular, with several small peninsulas and inlets. The overall image has a high-contrast, somewhat grainy quality typical of satellite photography.

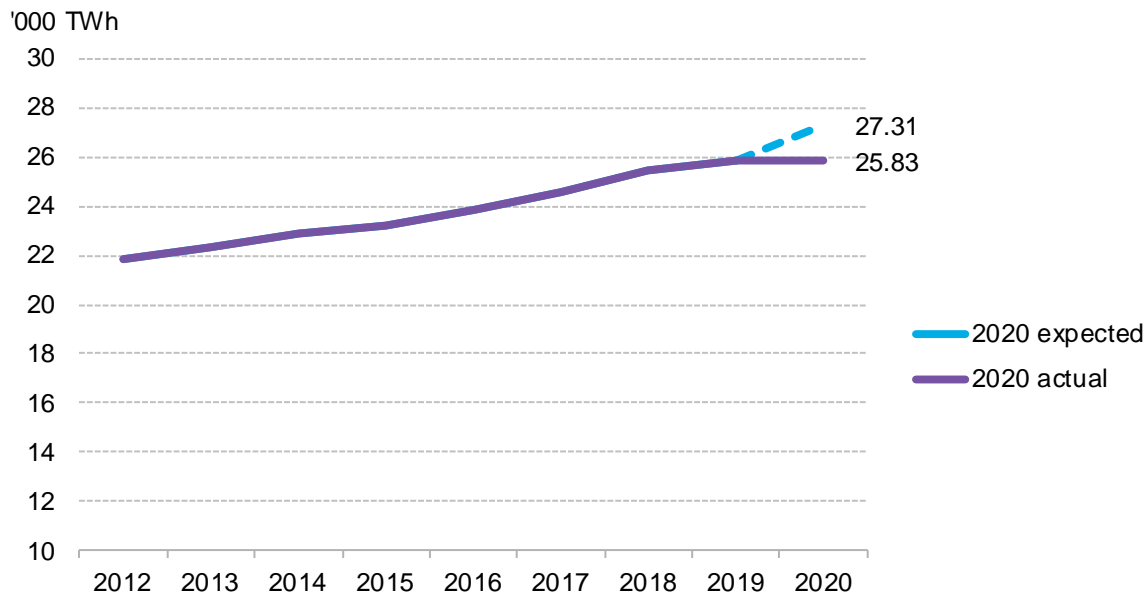
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02. Progress

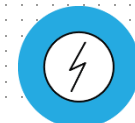
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Global electricity demand: flat in 2020 and 5.5% below pre-Covid expectations

2020 generation vs. BNEF's New Energy Outlook 2019 scenario



Source: BloombergNEF New Energy Outlook 2019.



Power



Transport



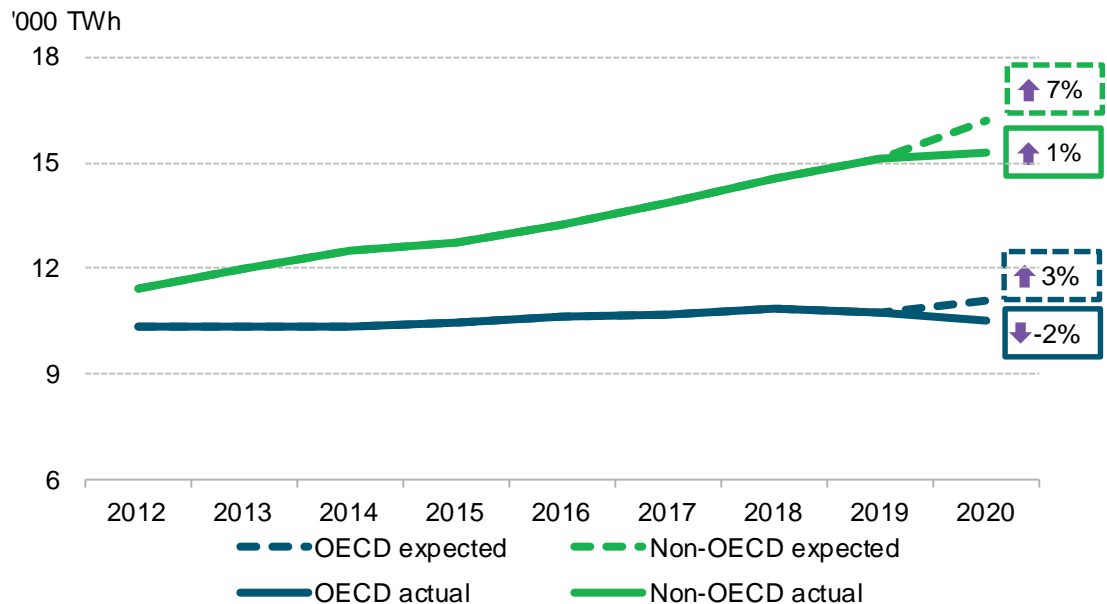
Buildings

Despite the sharp curtailment in economic activity, global electricity consumption flat-lined in 2020, but did not fall substantially. Stay-at-home orders and other measures cut demand from some segments of the economy and changed usage patterns, but 2020 consumption totalled 25.8TWh – just slightly below 2019's level.

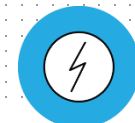
Nonetheless, consumption was far lower than had been anticipated. BNEF's New Energy Outlook 2019, published before the pandemic, assumed a 5% year-on-year rate of growth, which would have brought global power consumption to 27.3TWh in 2020.

Lockdowns impacted OECD and non-OECD countries differently

Actual vs. expected generation



Source: BloombergNEF. Note: 2020 growth assumptions based on NEO 2019 (published before the pandemic).



Power



Transport



Buildings

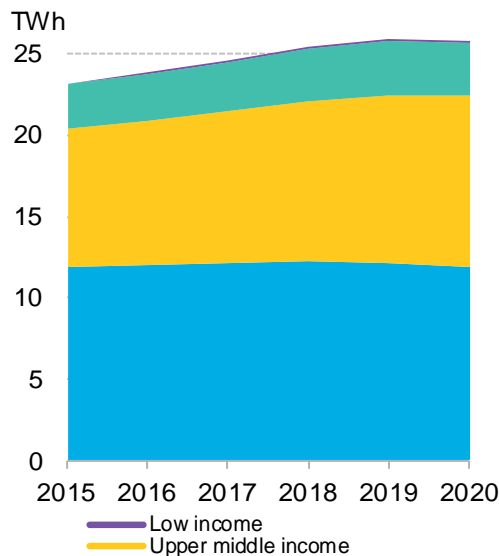
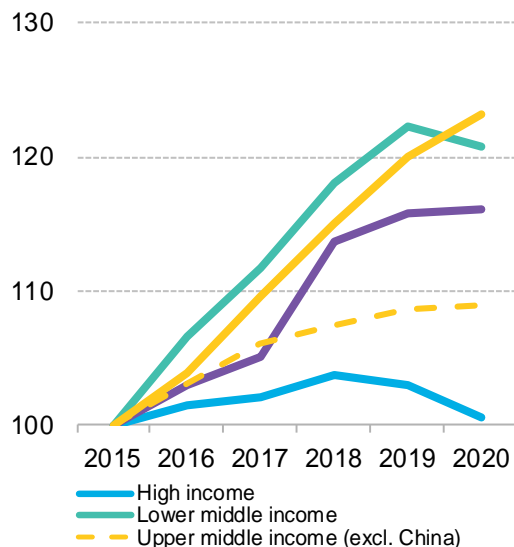
Generation in developing (non-OECD) nations continued to rise in 2020 despite the pandemic, but slipped in wealthier (OECD) countries. Non-OECD generation demand inched up 1% though that was far below the 7% growth rate projected under BNEF's 2019 New Energy Outlook, published before the pandemic. In OECD nations, demand dropped 2% in absolute terms from 2019. BNEF had expected demand in these nations to grow 3% year-on-year.

China's sustained growth contributed significantly to the top line figure for non-OECD countries. Electricity generation rose 4% in China 2019-2020 to 7,43TWh. Across the rest of the non-OECD nations, generation actually slid 1%.

Demand dropped most in high- and lower-middle income markets

Change in annual generation by country income levels relative to 2015

Total generation by country income levels

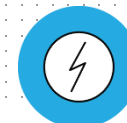


Countries designated as “high” and “lower middle income” saw electricity generation slip most sharply. The former saw 2020 demand drop to its lowest level in five years.

Upper middle-income countries were the only group that saw continuous growth in electricity generation over 2015-2020. However, once China is excluded from this group, its curve is much flatter, attesting to China’s big role among countries of the same income group.

Low-income markets were the least affected during the pandemic, with demand remaining flat year-on-year. Cambodia, Mozambique and Congo (D.R) represents 40% of the group’s electricity demand and, along with the other markets in this group, they have the lowest electrification rates, being unable to meet their own demand even in normal times.

Source: BloombergNEF. Note: Country income groups categories from The World Bank. Ethiopia was excluded from the low income group due to lack of data.



Power



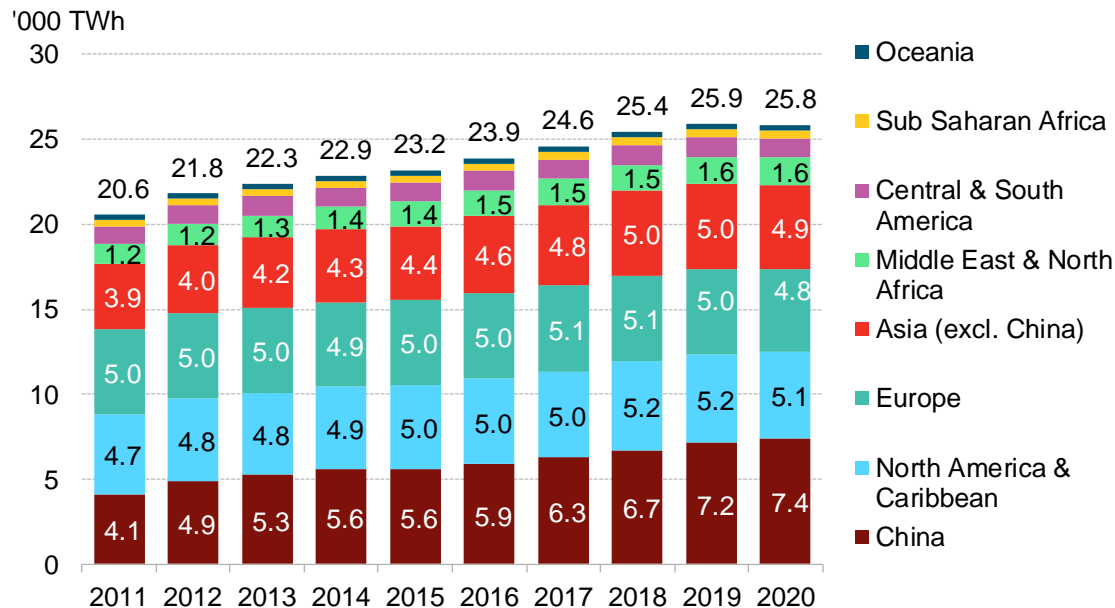
Transport



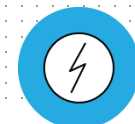
Buildings

China approaches 30% total global power generation

Global generation vs. China



Source: BloombergNEF



Power



Transport



Buildings

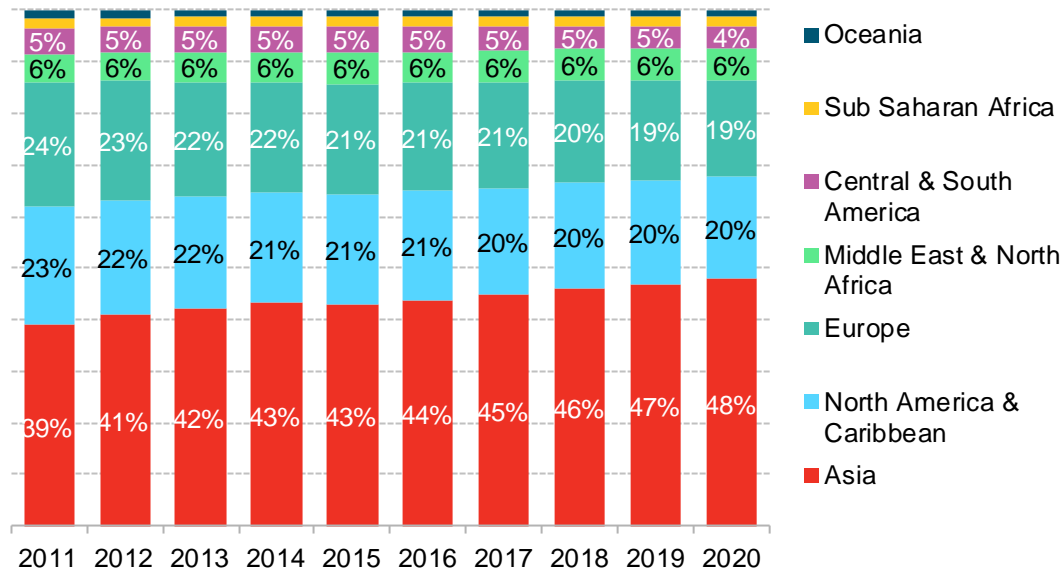
China has been the world's biggest producer of electricity since 2012 and with 7.4TWh generation in 2020 accounted for 28.6% of the global total. In 2020, China's generation topped that of North America and the Middle East and North Africa regions combined.

China is the driver of Asia's constant power demand growth. Asia ex-China generation actually slipped 2019-20 from 5TWh to 4.8TWh.

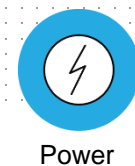
China's 3.8% year-on-year production growth stood in contrast to much of the rest of the world but was still modest compared with recent years. Power demand grew 6.3% 2018-19, for instance.

Asia is almost half of global electricity demand

Share of annual generation by region



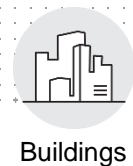
Source: BloombergNEF ([BNEF.com capacity/generation tool](https://www.bnef.com/capacity/generation-tool/)).



Power



Transport



Buildings

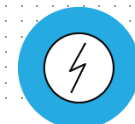
Asia's demand for electricity has risen swiftly over the past decade and the continent now accounts for almost half of global generation. The region was home to 48% of global power generation in 2020, up from 39% in 2011.

North America remains the second-largest region, accounting for 20% of the global total in 2020. The region has held its share constant since 2017.

Europe has lost the most ground to other regions over the decade. Accounting for 24% of annual generation in 2011, by year-end 2020 that had dropped to 19% of global demand.

Africa and Central & South America have broadly held their shares of generation, as they have kept pace with global electricity demand growth. However, South America slipped from 5% in 2019 to 4% in 2020.

Power generation stayed flat in 2020



Power

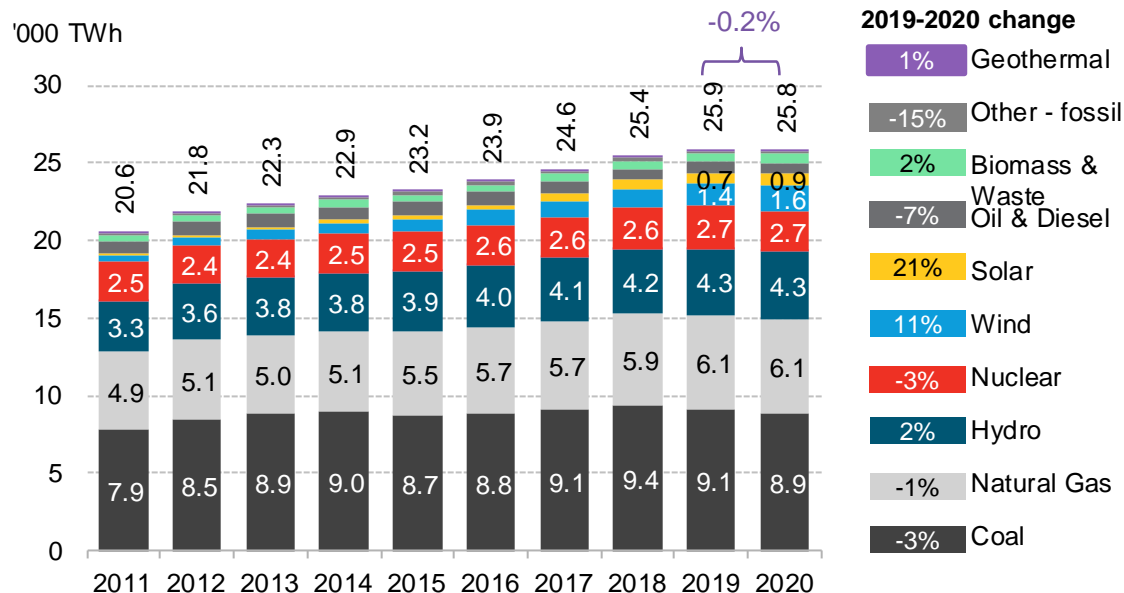


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Global annual generation by technology



Global power generation totalled 25.83TWh in 2020, down 0.2% from 2019. At the height of the pandemic, it appeared generation would drop sharply in 2020. Instead, steady growth in upper middle-income countries, led by China, contributed to higher-than-expected generation in 2020.

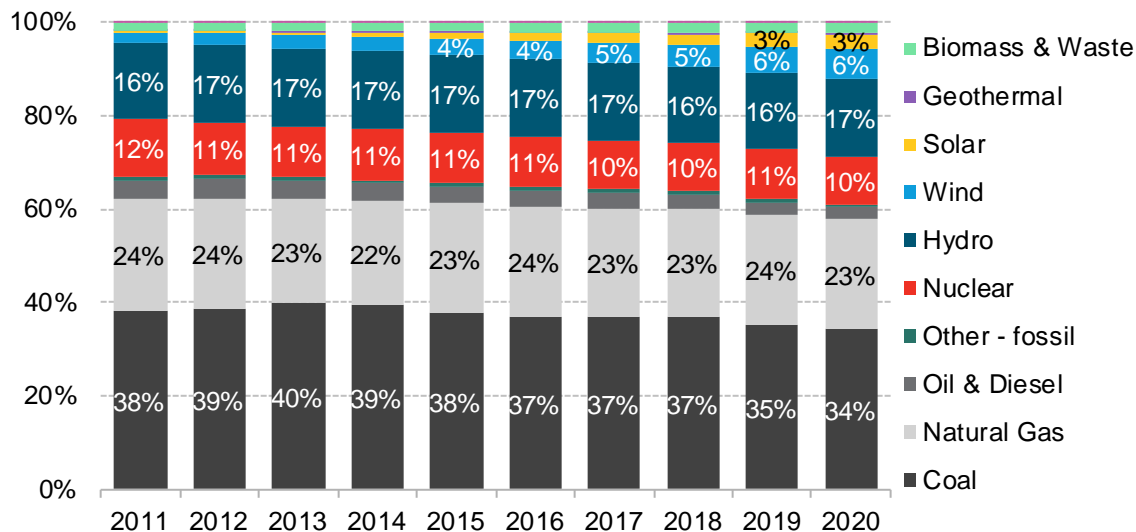
While fossil fuel generation dropped, renewables played a bigger role in 2020. Fossil generation is down 3% since 2018. In contrast, renewables rose by 13% in two years.

Although overall generation remained flat since, the trend varied widely by technology. Coal generation dropped to its lowest level since 2015, and was down by 3% from 2019. Wind and solar led the generation boom on the renewables side.

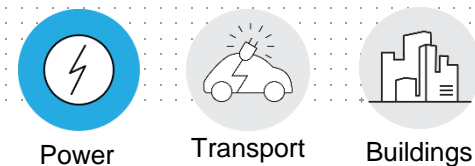
Source: BloombergNEF.

Renewables put the squeeze on coal with record output in 2020

Share of global generation by technology



Source: BloombergNEF



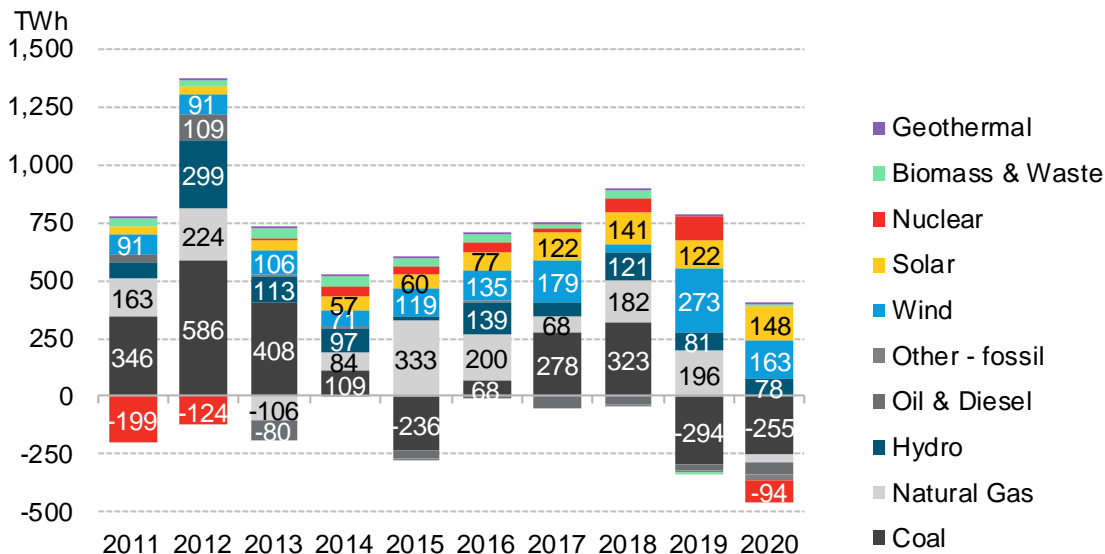
Non-hydro renewables reached 12% of total generation, compared to 9% in 2018 and 4% in 2011. Wind accounted for 6% in 2020, followed by solar (3%). The share of renewables jumps to 29% when including hydro generation.

Coal represented 34% of total power production in 2020, down from a 10-year high of 40% in 2013. This was the also smallest share in over 20 years.

The share of generation from natural gas and nuclear held steady over the past three years. Gas accounted for 23% of the total power produced in 2020, while nuclear represented 10%.

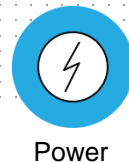
In a first, only renewables saw a net year-on year generation rise

Annual generation change



Renewable energy technologies (including hydro) enjoyed substantial gains in 2020 and were responsible for all additional generation on a net basis. In contrast, fossil fuels saw their biggest year-on-year drop in a decade. The total net change in power produced globally was also the smallest in absolute terms in a decade.

Solar generation grew more than ever in 2020, with 148TWh more generation in 2020 compared to 2019. Solar and wind accounted for 310TWh, or roughly 77.5%, of new generation, while fossil fuels dropped by 362TWh.



Power



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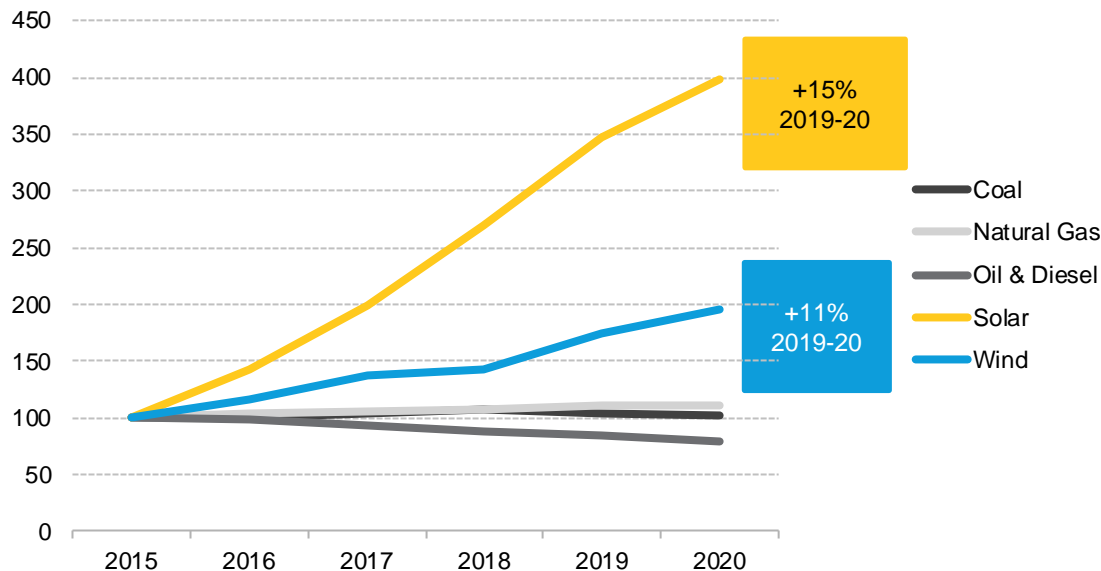


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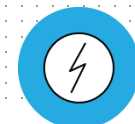
Source: BloombergNEF

Solar and wind dominate generation growth

Change in annual generation by technology relative to 2015 levels



Source: BloombergNEF. Note: the percentage growth highlighted on the chart is relative to 2019 figures.



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Solar has outshined all other technologies in annual generation growth since 2015.

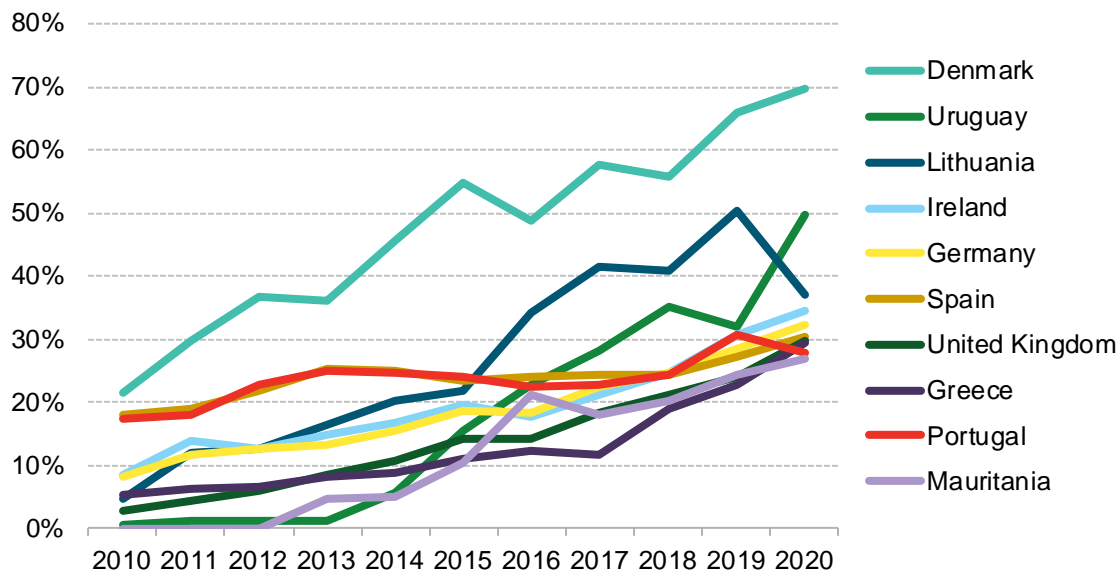
For 2019-20 solar generation jumped 15%, despite the pandemic. For 2016-20, production from solar is up 178%. Wind generation grew 11% 2019-20, and 67% 2016-2020.

Power generation from fossil fuels has stayed flat. The contribution of natural gas grew 11% 2015-2020, while coal generation grew just 1% over the same time.

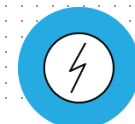
Oil and diesel has faced continued decline since 2015, shrinking 21% from 2015 to 2020. It is the technology that has seen the fastest relative decline in global electricity supply.

Ten countries now get over a quarter of their power from wind and solar

Leading nations' wind/solar penetration rates



Source: BloombergNEF



Power



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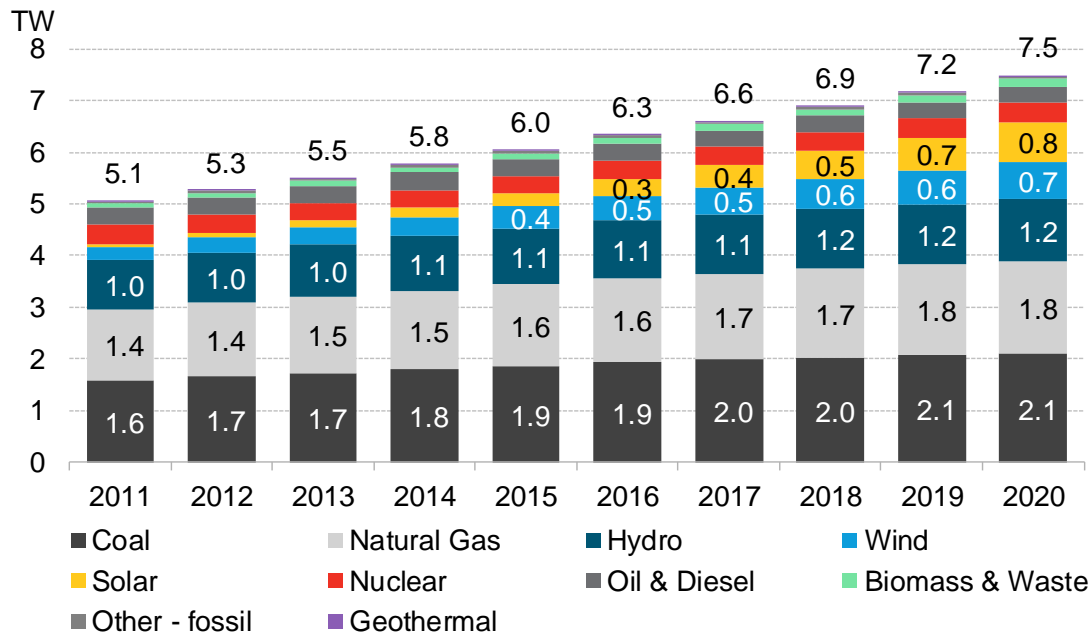
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Denmark was the leader in 2020 in terms of wind and solar penetration, with 70% of its power coming from the two technologies, up somewhat from 66% in 2019.

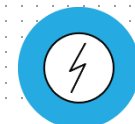
Most of the other countries with penetration rates for wind/solar exceeding 25% are also in Europe. Uruguay and Mauritania were the only two outside the continent to cross the threshold. Uruguay got half its power from these sources in 2020, compared to 32% in 2019. Mauritania ranks 10th on the list in 2020 and secured 27% from these sources.

Despite the pandemic, global power-generating capacity grew 4% in 2020

Global installed capacity by technology



Source: BloombergNEF



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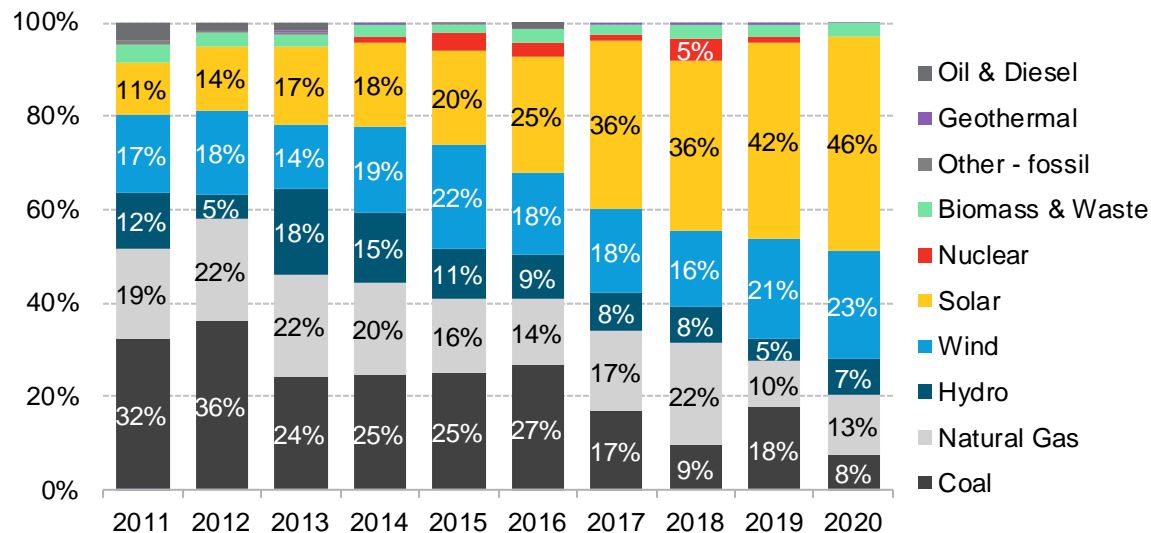
Global power generating capacity is up by nearly half since 2011 and reached 7.5TW in 2020. Coal still accounts for the biggest share at 2.1TW. However, its share on a percentage basis has stayed generally flat over the last decade. Coal was 28% of installed capacity in 2020.

Renewables (including hydro) reached 38% of installed capacity in 2020. Excluding hydro, renewable sources (mainly wind and solar) make up 22%.

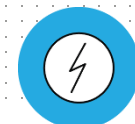
Solar and wind lead the exponential growth of renewables, accounting for 20% of total capacity in 2020 compared to just 5% in 2011.

Wind and solar accounted for over two-thirds of net new capacity in 2020

Share of global capacity additions by technology



Source: BloombergNEF. Note: Share of global capacity additions excluding retirements.



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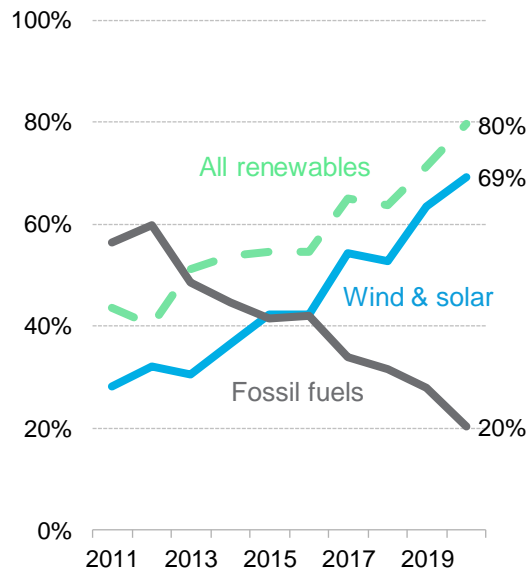
While electricity demand remained flat 2019-20, new power-generating capacity added reached its highest level in a decade at 314GW.

Wind and solar accounted for 69% of the total new build at 218GW – twice the build rate of a decade ago. Solar enjoyed another record year, representing 46% of total additions. Including biomass, geothermal and hydro, renewables additions represented 80% of global net capacity growth in 2020.

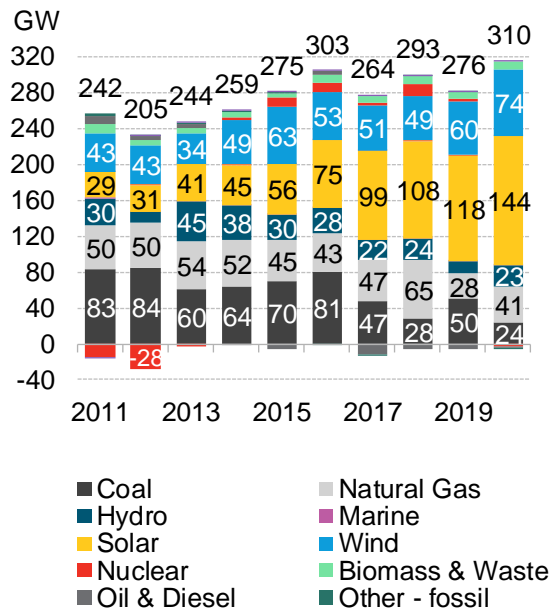
In 2020, the world saw the lowest level of new coal build in a decade, with only 24GW added compared to 50GW in 2019. Coal closures also contributed to the modest growth in coal capacity. What was once the top technology at the beginning of the decade represented just 7.5% of total additions in 2020.

Fossil fuels decline as wind and solar offer cheaper bulk power

Global share of net capacity additions



Global year-on-year capacity change



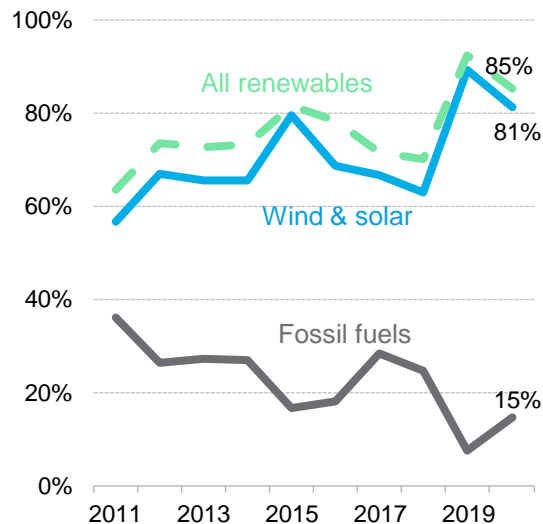
Fossil fuels represented a third of capacity additions in 2020, but reached their lowest level this decade, down from 60% of new build in 2012. Natural gas was the top fossil fuel added in 2020, accounting for 13% of total additions.

The reversal of the roles of fossil fuels and renewables was led by PV and onshore wind. These are now the cheapest sources of new bulk power generation in countries that make up two-thirds of world population, 76% of global GDP and 90% of electricity demand. In addition, with the goal of achieving net zero, many large economies have started retiring coal power plants and pledged to not build new ones.

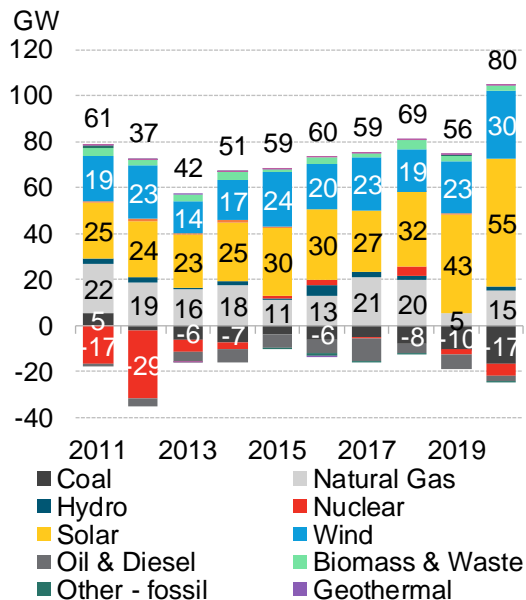
Source: BloombergNEF

Developed markets hit record capacity additions and coal retirements

Developed markets' share of net capacity additions



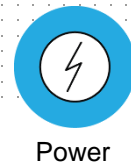
Developed markets' year-on-year capacity change



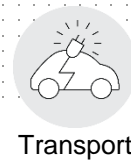
Wealthier nations accounted for a quarter of new capacity additions worldwide in 2020.

They saw record-high wind and solar capacity additions, with 85GW installed in 2020. This represents a 93% increase over the decade.

Still, these markets saw a 7% rise in fossil fuel capacity 2019-2020. This was due to 12GW of natural gas added in Belgium, the U.K. and the U.S. in 2020, as well as 3GW of gas added in other developed markets.



Power



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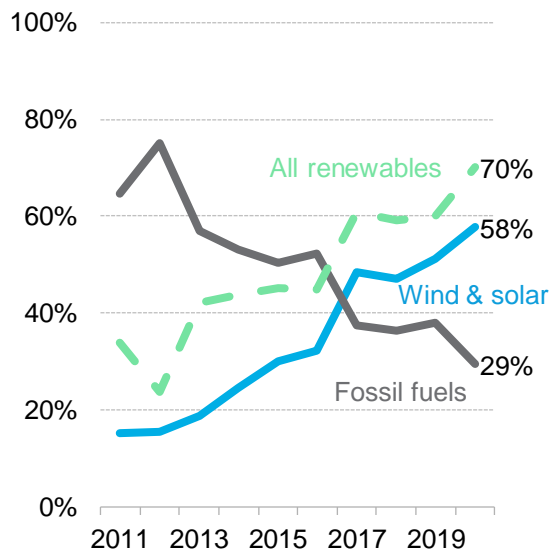


Buildings

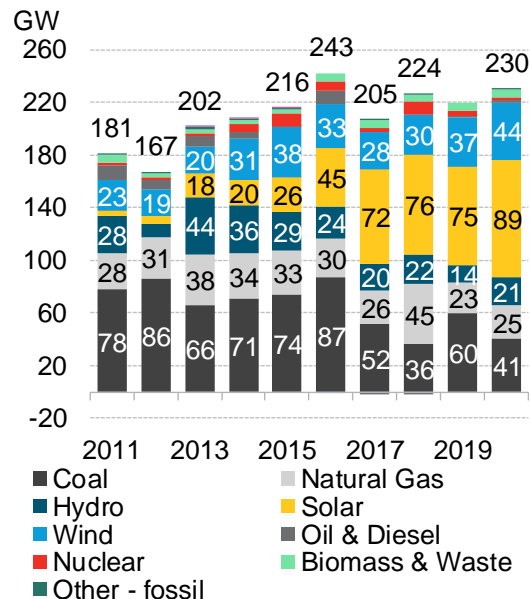
Source: BloombergNEF

In developing nations, fossil additions collapse as wind and solar triple

Developing markets' share of net capacity additions



Developing markets' year-on-year capacity change



Wind and solar capacity installation rates in developing markets tripled from 2011-2020.

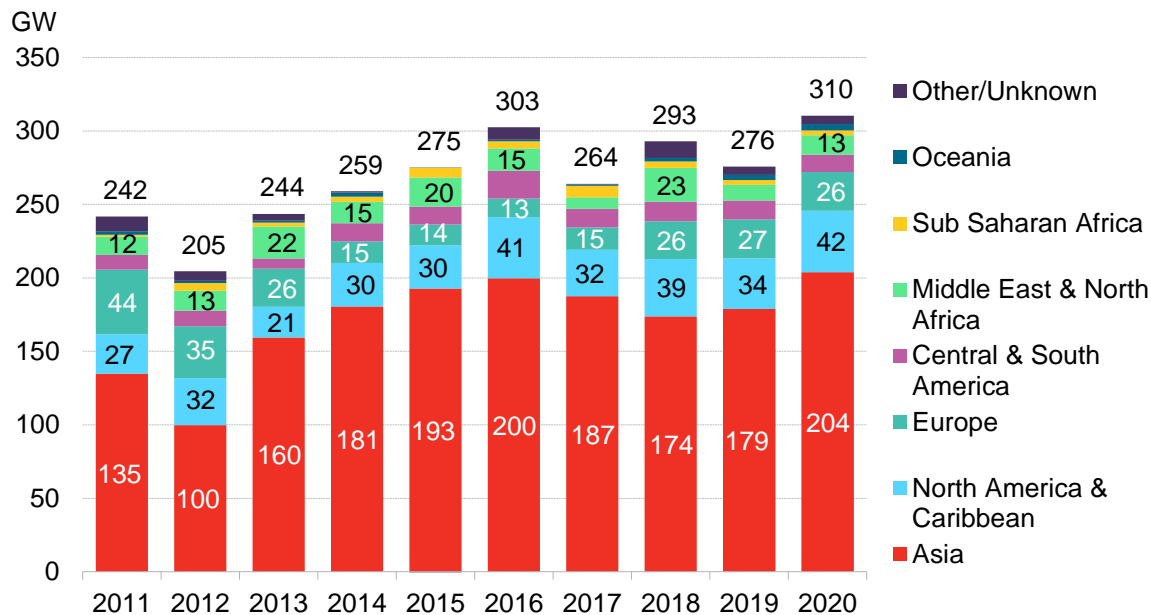
Developing markets added 230GW of new capacity in 2020, with solar and wind being responsible for almost 58% of the total (133GW). All renewables (including hydro) reached 70% of net capacity additions in 2020, from 34% in 2011.

Fossil fuels' share of net capacity additions fell to their lowest level since 2011, representing only 29% in 2020 compared to 38% in 2019. This drop was led by coal, which saw its lowest share of net capacity additions of all time. Coal had a 52% share in 2012, dropping to 18% in 2020. Natural gas and oil made up 11% and 1% of fossil fuel additions in 2020, respectively.

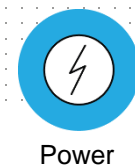
Source: BloombergNEF

A 10-year high for new power-generating capacity added in 2020

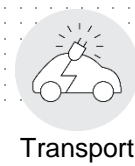
Global capacity additions by region



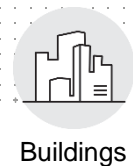
Source: BloombergNEF



Power



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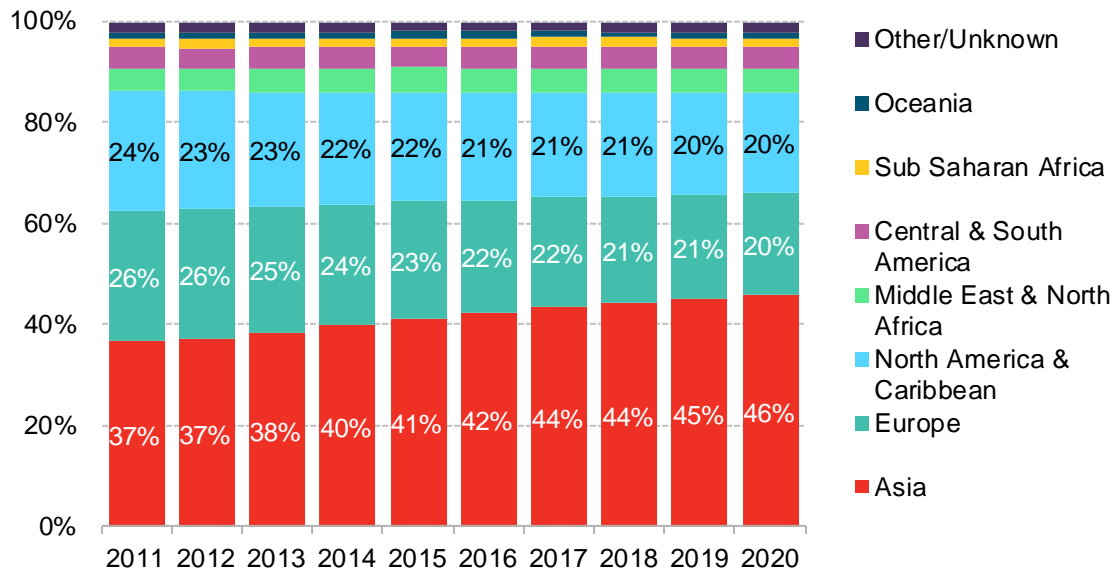
Despite the pandemic, 2020 recorded the highest global capacity additions in a decade, with 310GW installed. Asia led, with 204GW added, followed by North America (42GW) and Europe (26GW).

China accounted for nearly half of all capacity added in 2020 with 152GW built, 30% more than in 2019. This marked a record high in capacity additions over the decade. Solar accounted for a third of it, followed by wind with 36GW and coal with 35GW. Renewables including hydro totalled 108GW.

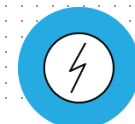
North America & Caribbean and Europe followed with 42GW and 26GW of new capacity added in 2020, respectively. In both regions, wind and solar accounted for over 80% of the total capacity installed.

Asia expands to reach 46% of global installed capacity

Share of global installed capacity by region



Source: BloombergNEF



Power



Transport



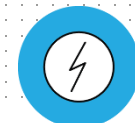
Buildings

Asia's role in the global power mix has grown quickly over the last two decades.

As of year-end 2020, the region was home to 46% of all power-generating capacity globally, up from 36% in 2011. Some 43% of Asia's capacity is in China, which saw its total capacity more than double over the decade.

North America and Europe remain level as the second largest regions in terms of total installed capacity. Thanks to Asia's growth, the share of these regions in the global context is falling. As of year-end 2020, North America's share of the global total has dropped from 24% a decade ago to 20%, while Europe's shrunk from 26% to 20%.

Ten countries have accounted for 81% of solar additions over the last decade



Power

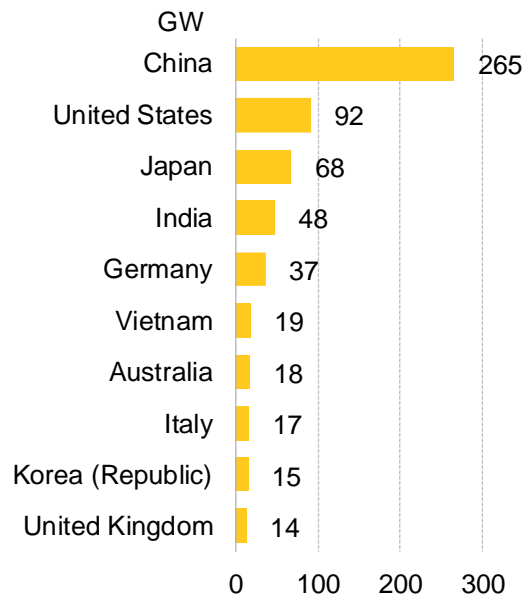


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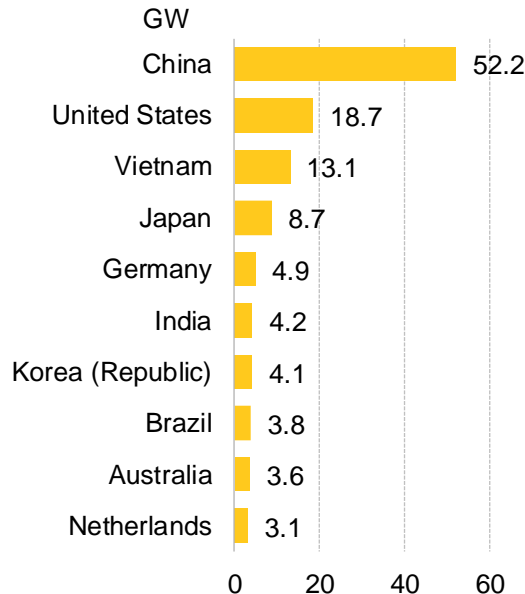


Buildings

Top 10 markets for solar capacity additions, 2011-2020



Top 10 markets for solar capacity additions, 2020



Ten countries were responsible for 81% of the 730GW of new solar built over the past decade.

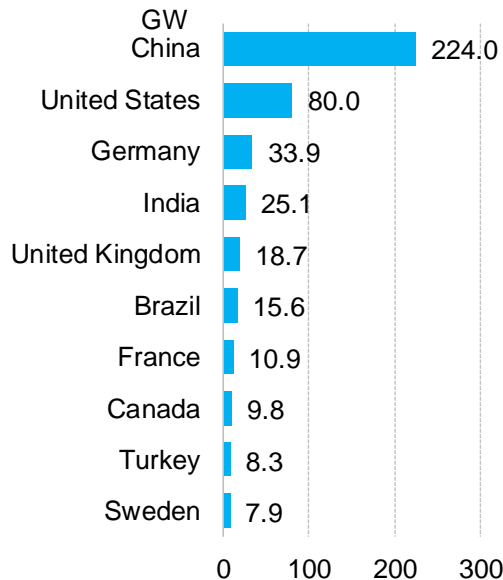
Globally, solar installations have remained quite concentrated in a relatively small number of nations. However, solar as a share of local installed capacity can be far more significant in smaller countries. In 2020, for example, solar was more than a fifth of capacity in Afghanistan, El Salvador, Honduras, Jordan, Namibia and Senegal.

Rather remarkably, Vietnam was the world's third-largest national market for solar in 2020 with 13.1GW added. The country installed as little as 169MW just three years ago. A highly effective solar feed-in tariff policy launched in May 2020 ([web](#) | [terminal](#)) has helped drive growth.

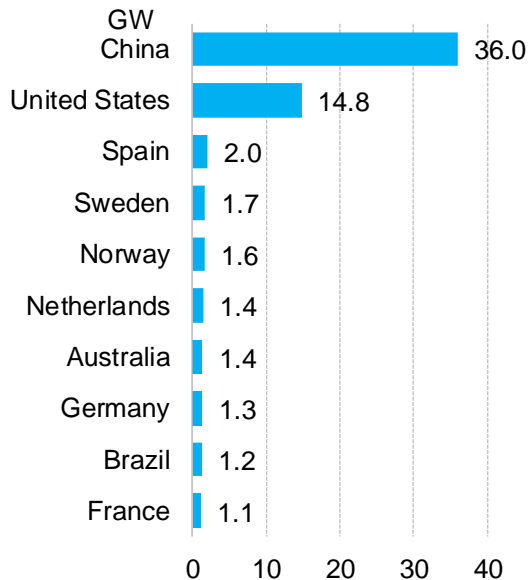
Source: BloombergNEF. Note: Graphs show net capacity additions.

Wind remains more popular in developed countries

Top 10 markets for wind capacity additions, 2011-2020



Top 10 markets for wind capacity additions, 2020



Wind installations remain relatively concentrated in a small number of nations, with the top ten countries accounting for 84% of the global capacity additions in the decade. Spain, for example, represents only 1% of overall global capacity but 4% of the total wind capacity installed in 2020.

The majority of wind capacity additions have been in developed countries, while China and India lead the developing markets ranking for wind.



Power



Transport



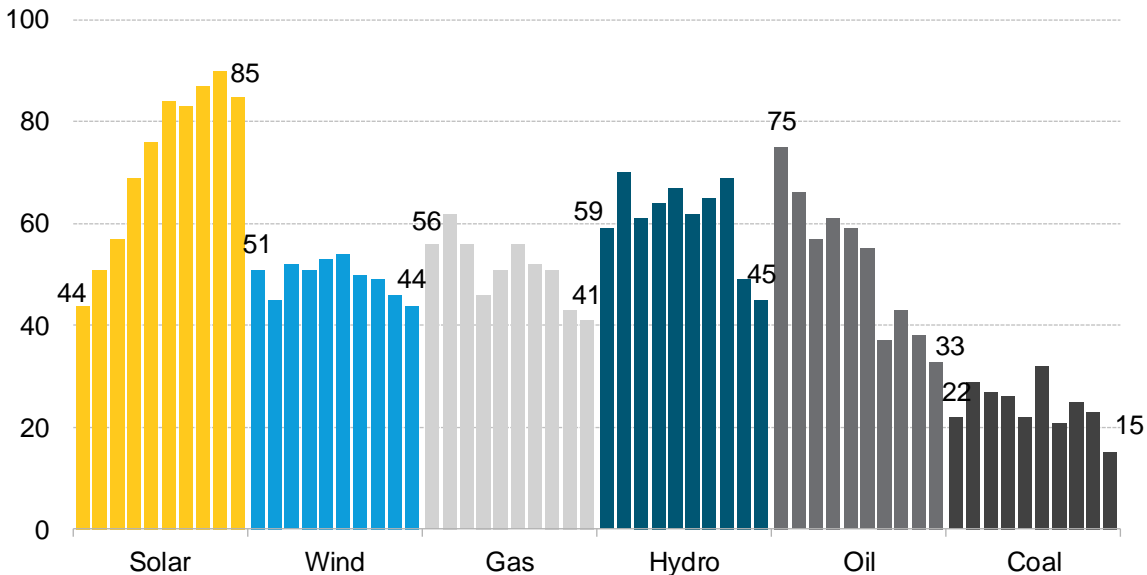
Buildings

Source: BloombergNEF. Note: Graphs show net capacity additions.

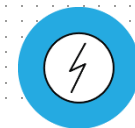
85 countries installed at least 1MW of solar in 2020

Number of countries with over 1MW installed per year, 2011-2020

Number of markets



Source: BloombergNEF. Note: based on country-level research for 137 markets.



Power



Transport



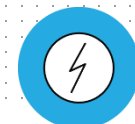
Buildings

In 2020, 85 countries installed at least 1MW of new solar capacity. This is almost twice the number of countries adding wind or hydro. The modular nature of PV, in addition to steep price declines, help explain the technology's proliferation.

In contrast, the number of countries that installed at least 1MW of new oil-fired power-generating capacity shrank from 75 in 2011 to 33 in 2020. This was mostly concentrated in developing nations, particularly in Asia and South America. Only 16 of the 33 nations added more than 50MW of net oil capacity.

In 2011, fossil sources were the top choice in half the world's markets

Most popular new power-generating technology installed in 2011



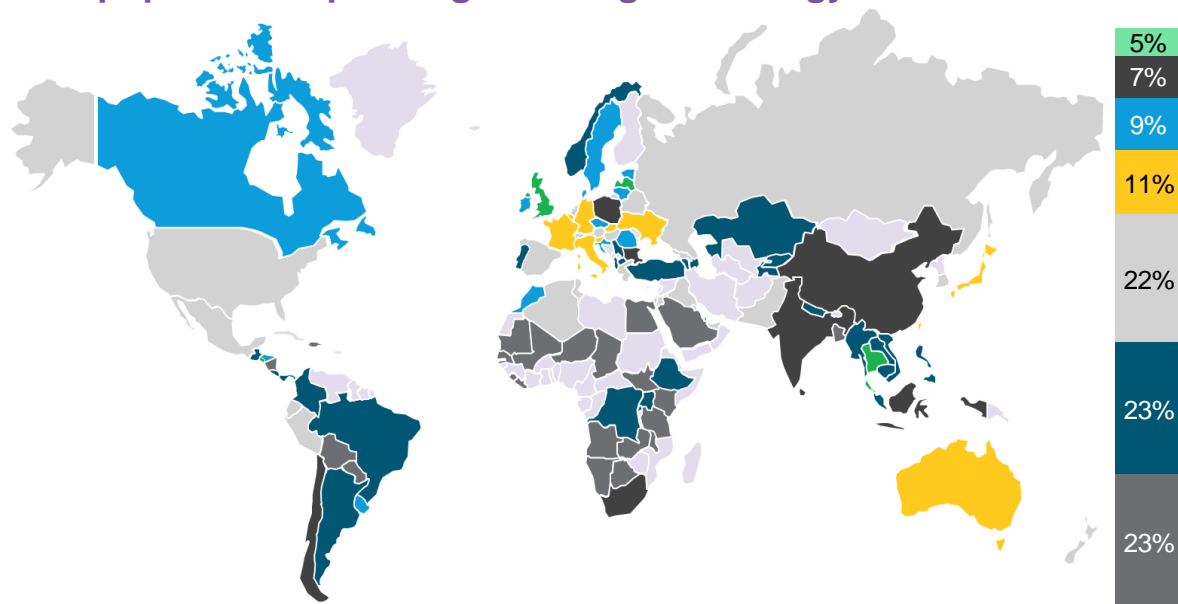
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In 2011, nearly half of the world's nations added more fossil fuel fired power-generating capacity than other technologies, with oil-fired capacity being the top choice in 24 countries. Coal was the choice in eight countries in 2011, and gas, 22.

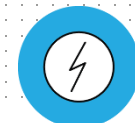
Solar and wind were most popular on a new capacity installed basis in just 11 and 13 countries, respectively. Hydro was the top choice in a quarter of nations. In total, renewable energy technologies of all sorts were the dominant source of new capacity deployed in 51% of markets.

■ Coal ■ Natural Gas ■ Hydro ■ Solar ■ Wind ■ Nuclear ■ Biomass & Waste ■ Oil & Diesel ■ Geothermal ■ No additions/not available

Source: BloombergNEF. Note: Map colored by which technology was most installed in 2011 alone. Chart depicts the percentage of nations that installed the most megawatts of each technology. It is based on country-level data for 137 nations, but excludes countries that have not recorded any capacity addition. Solar includes small-scale PV.

In 2020, solar was the most installed technology in half the world's nations

Most popular new power-generating technology installed in 2020



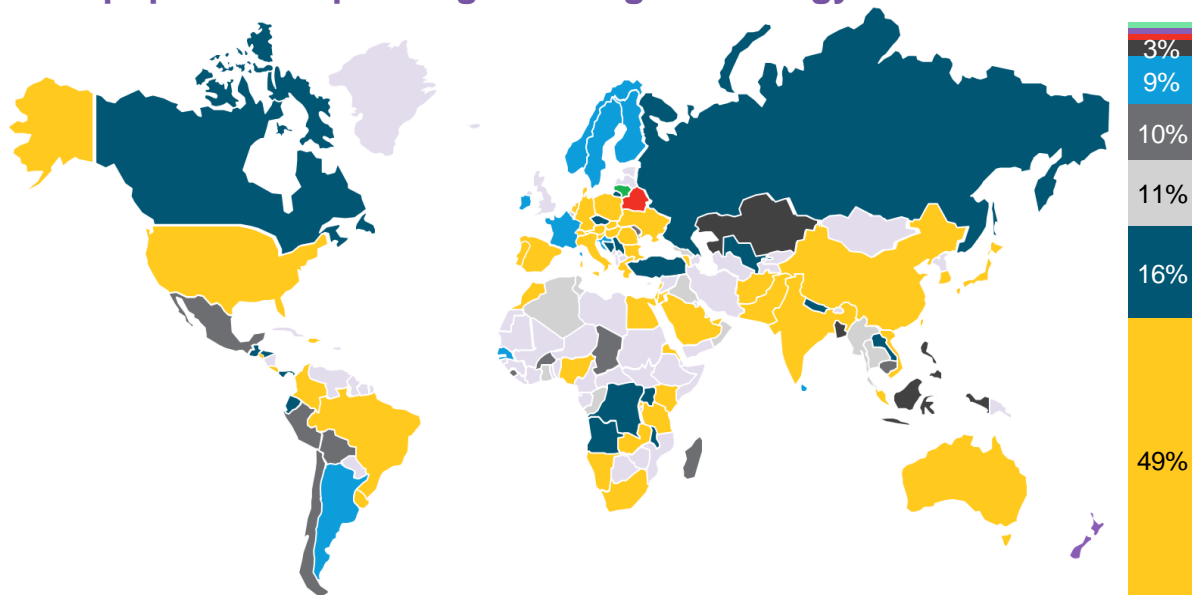
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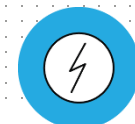
The fundamental transformation of which technologies are getting deployed worldwide highlights the clean energy evolution underway. Renewables were the most popular new power-generating technology deployed on a capacity basis in 75% of countries in 2020. In 51 countries, solar was the most installed, compared to 41 in 2019 and 11 in 2011.

For the first time, China added more renewables capacity than fossil fuels, with solar the top choice in 2020. Coal was the most added technology in only three markets, compared to 11 in 2019.

■ Coal ■ Natural Gas ■ Hydro ■ Solar ■ Wind ■ Nuclear ■ Biomass & Waste ■ Oil & Diesel ■ Geothermal ■ No additions/not available

Source: BloombergNEF. Note: Map colored by which technology was most installed in 2020 alone. Chart depicts the percentage of nations that installed the most megawatts of each technology. It is based on country-level data for 137 nations, but excludes countries that have not recorded any capacity addition. Solar includes small-scale PV.

Fossil fuel power-generating capacity keeps growing, but at a slower pace



Power

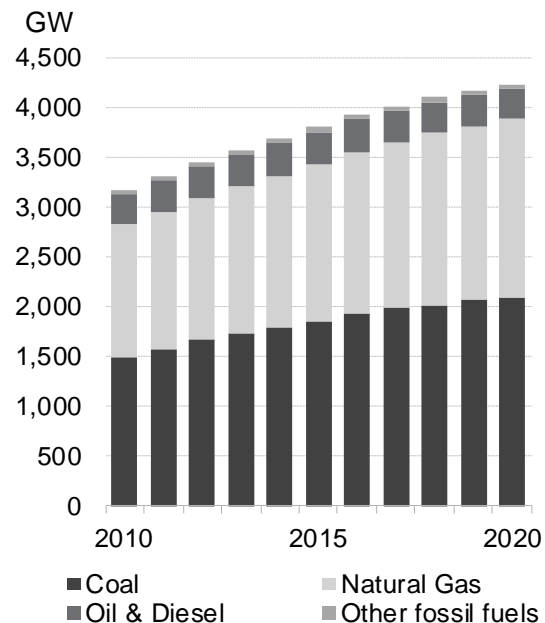


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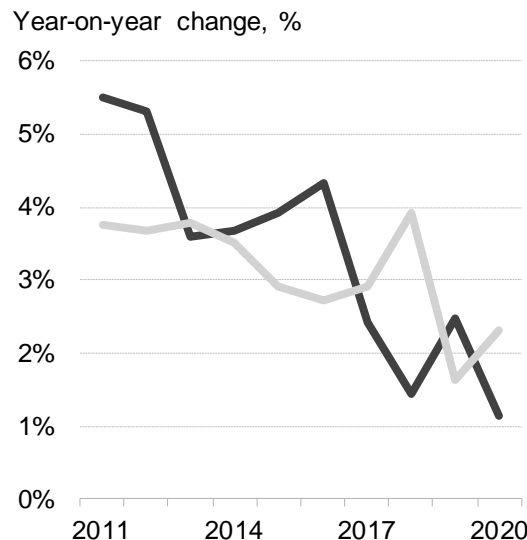
Buildings

Global fossil fuel fleet



Source: BloombergNEF

Year-on-year capacity growth

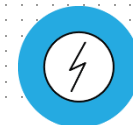


Fossil fuel capacity grew by around 1,000GW from 2010 to 2020. Just over half of the added capacity was coal fired, while the rest was mainly gas. Oil-fired capacity slipped by around 3%.

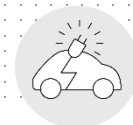
The pace of coal additions is slowing and 2020 saw the lowest volume of new capacity added in the past decade. Total coal capacity grew by 24GW in 2020. The pandemic fuelled an already emergent trend driven by political targets for coal phase-outs, increasing commodity prices and difficulties to get financing for coal plants.

Gas additions jumped to 41GW in 2020, after an unusually weak 2019 in which just 28GW were added.

Asian markets: home to most new coal



Power

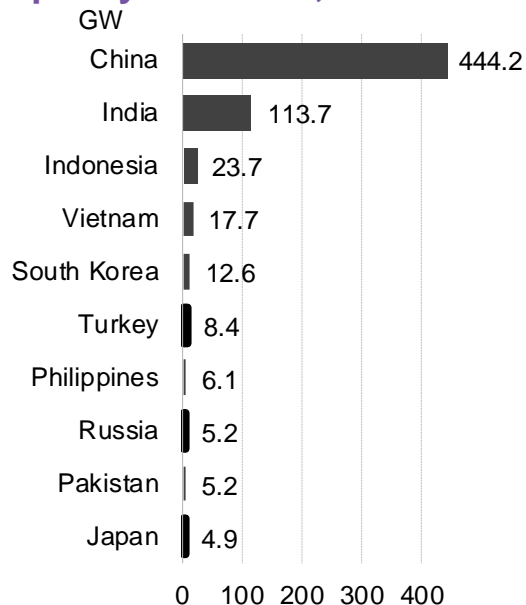


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Top 10 markets for net coal capacity additions, 2011-2020



Top 10 markets for coal capacity additions, 2020



China and India have led in the building of new coal-fired power-generating capacity over the last decade. The two accounted for 95% of all new coal additions.

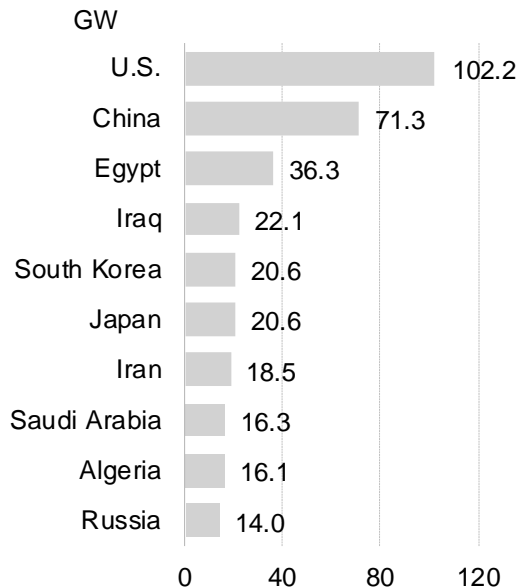
Asian nations added 43GW of new coal in 2020. China built most, adding 35GW, followed by Japan, Indonesia and Bangladesh. China's coal expansion was not significantly slowed by the pandemic, but India's 2020 coal build of 1GW was its lowest since 2006.

Ukraine and Germany bucked long-term trends to add coal capacity in 2020. Brazil grew its coal capacity by 24% from 2019 to 2020. The country also plans to increase domestic coal mining.

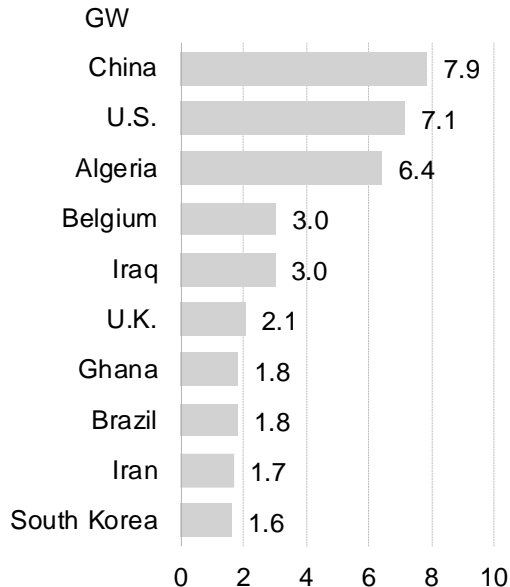
Source: BloombergNEF. Note: Graphs show net capacity additions.

Asia, the Middle East and the U.S. lead gas capacity deployment

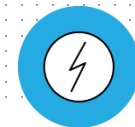
Top 10 markets for natural gas capacity additions, 2011-2020



Top 10 markets for natural gas capacity additions, 2020



Source: BloombergNEF. Note: Graphs show net capacity additions.



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Asia, the Middle East and the U.S. are tops for new natural gas-fired power plant additions on a capacity basis. The top 10 markets accounted for almost 70% of global gas capacity added in the past decade. In China and the Middle East, this has been driven by rising overall electricity demand. In the U.S., cheap shale gas has driven growth. In Asia, it is increased LNG availability.

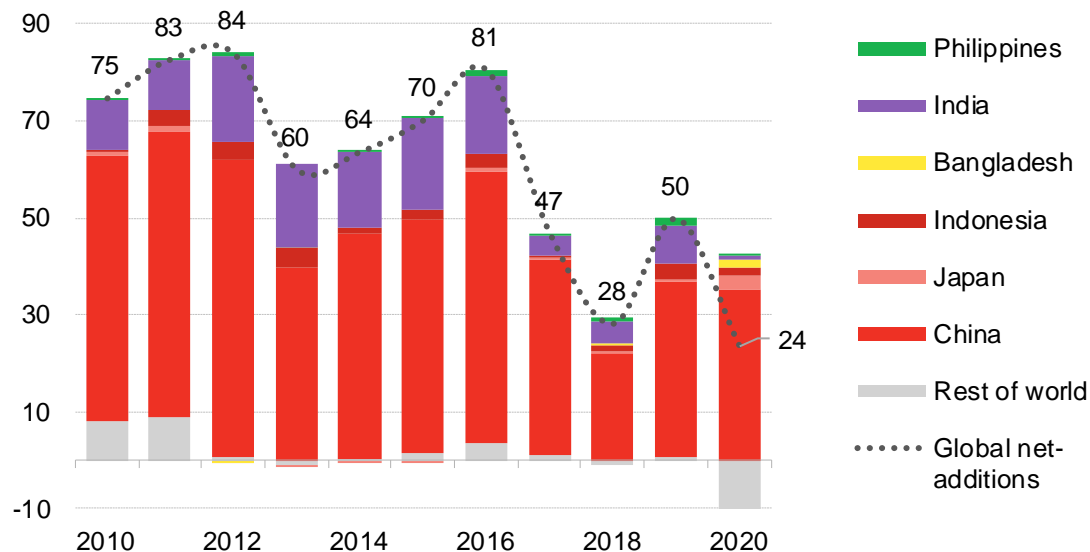
Gas is replacing old coal in Europe, South Korea and the U.S. In the U.K and Belgium, high gas capacity additions in 2020 are due to rapid coal plant closures and capacity payment contracts. South Korea and the U.S. have also started a shift from coal to gas capacity.

Gas is replacing some oil generation in the Middle East. Iraq, Egypt and Saudi Arabia together retired 7GW oil 2018-2020.

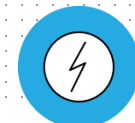
As coal declines everywhere but Asia, “no new coal” pledges grow

Annual net coal capacity additions

GW



Source: BloombergNEF. Note: Graph shows annual net capacity additions per country or region.



Power



Transport



Buildings

Coal plant retirements outpaced new coal additions in all regions except Asia in 2020.

China added 35.3GW. Outside Asia, net coal capacity declined 19GW.

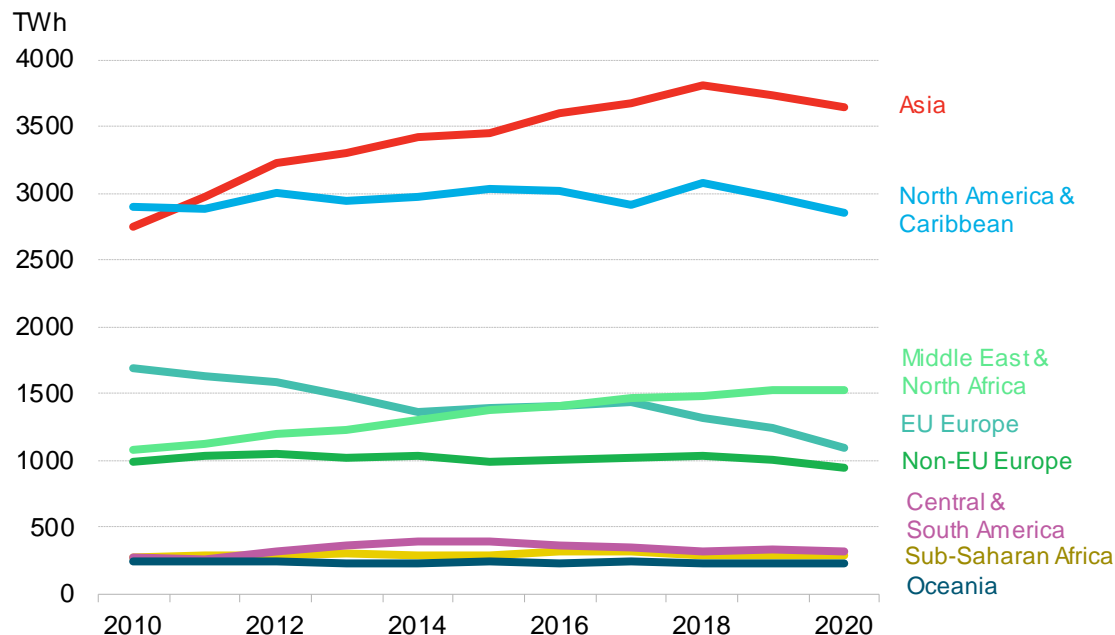
National governments, utilities, and financial institutions globally and even in Asia are increasingly adopting “no-new-coal” pledges.

The Philippines and Indonesia stopped permitting new coal plants from October 2020 and May 2021, respectively. Bangladesh cancelled 10 planned domestic coal plants in July 2021. Meanwhile, a growing number of countries have pledged to stop funding most overseas unabated coal projects. This includes Japan along with other Group-of-Seven nations, as well as South Korea and China.

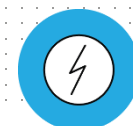
China, on the other hand, plans to continue its domestic coal spree despite a net-zero by 2060 target. The country has not set any target for phasing out coal.

Fossil fuel generation appears to have peaked

Fossil fuel generation per region



Source: BloombergNEF



Power



Transport



Buildings

Fossil fuel generation in Asia peaked in 2018. It first declined in 2019 and the trend continued in 2020, exacerbated by the pandemic.

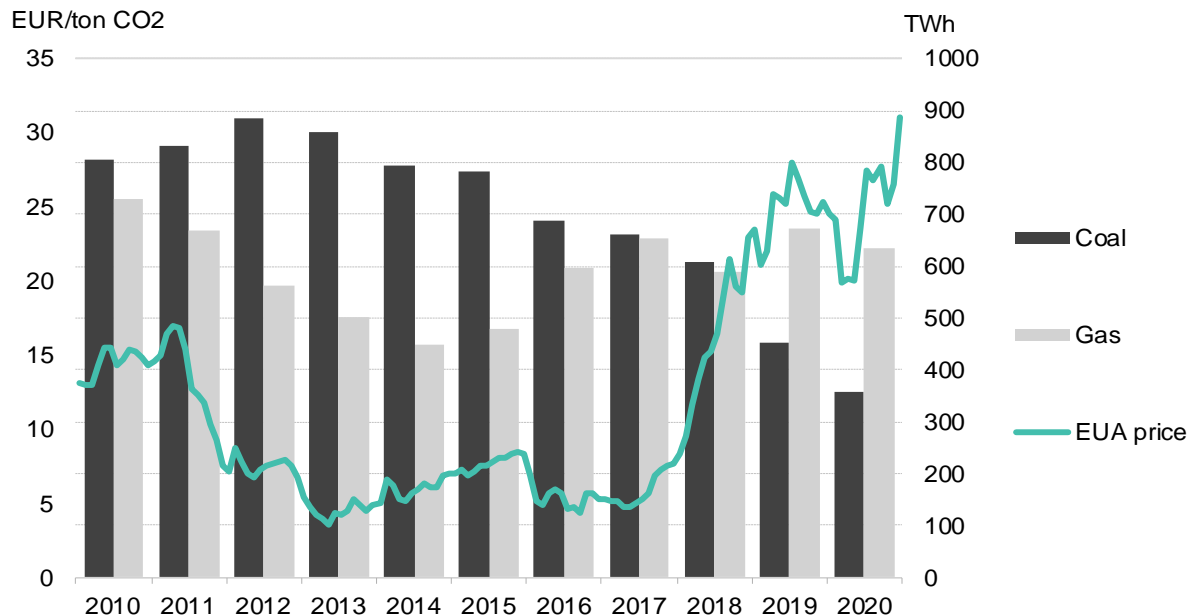
The Middle East and North Africa is the only region where fossil fuel generation shows a consistent upwards trend. Natural gas generation was 58% higher in 2020 than in 2010, and oil was up by 16%.

In Sub-Saharan Africa, fossil generation remained low and has increased only 5% since 2010.

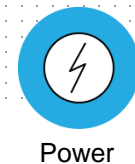
The European Union generates a third less power from fossil fuels than it did 10 years ago. Much of this decline has occurred since 2017 as the EU carbon price has surged.

High carbon and low gas prices squeezed EU coal in 2020

EU carbon price vs. coal and gas generation



Source: BloombergNEF. Note: EUA refers to the EU Carbon Allowance price and tracks against the left-hand axis. The right-hand axis tracks generation levels.



Power



Transport



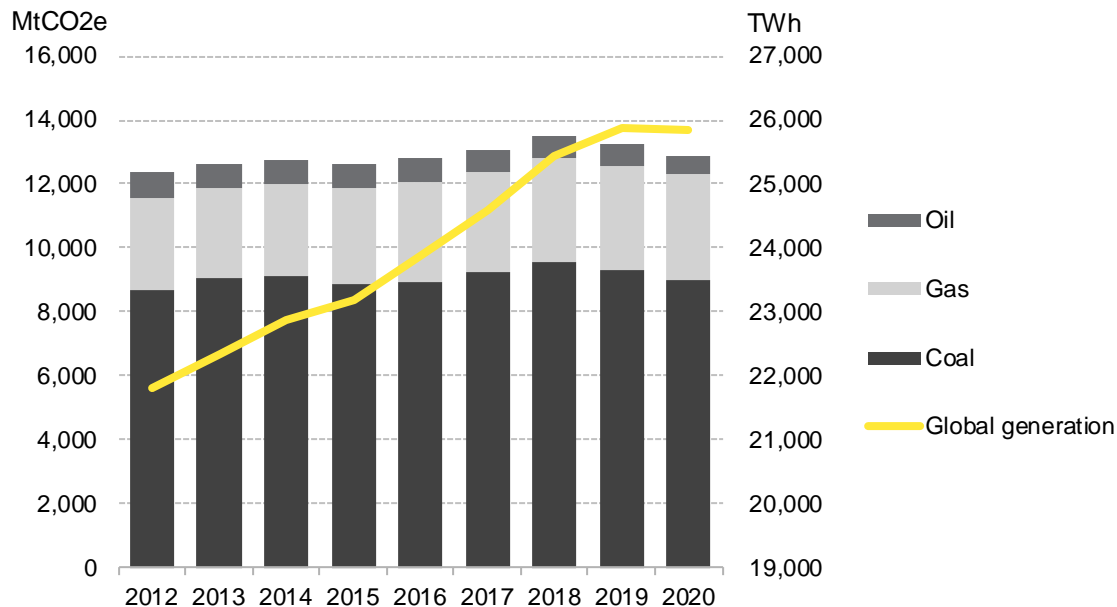
Buildings

Coal generation in the EU has been on a steady path downward after the bloc's carbon price rapidly rose in 2018. Coal generation has halved and almost 40GW coal capacity has retired since 2015.

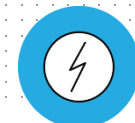
The generation mix continued to transition from coal to gas in 2019-2020. Gas prices in 2020 fell to their lowest level of the decade. Gas plants also incur lower compliance costs under the EU Emissions Trading System as gas has about half the smokestack emissions as coal. This triggered high levels of fuel-switching. As gas prices have risen in 2021, coal has staged somewhat of a comeback.

Global power sector emissions peaked in 2018, then dropped 2.6% 2019-2020

Power sector emissions against global generation



Source: BloombergNEF. Note: Generation mapped against right-hand axis, emissions (stacked bar) against the left-hand axis



Power



Transport

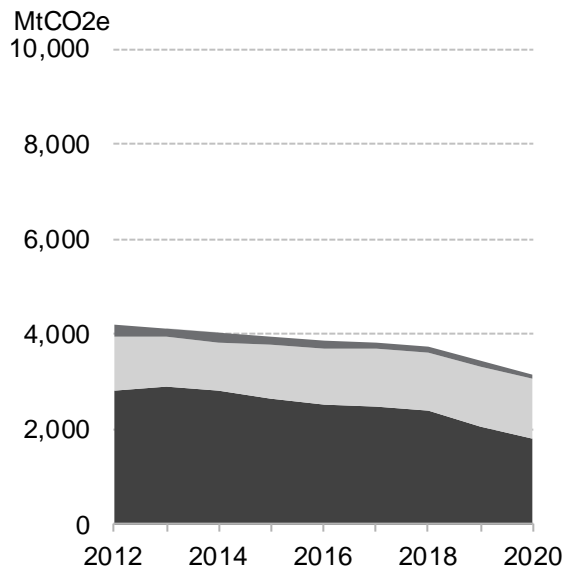


Buildings

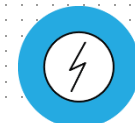
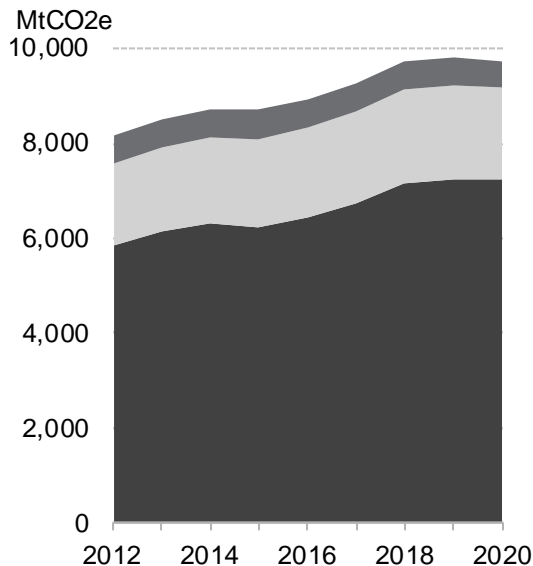
Power sector CO2 emissions dropped 2.6% from 2019 to 2020, marking the biggest year-on-year decline in at least a decade. This was mainly due to growing use of renewables. While generation remained essentially flat compared to the year prior, emissions dipped markedly.

Developed nations' emissions have dropped by a quarter from their peak

Developed markets' power sector emissions



Developing markets' power sector emissions



Power



Transport



Buildings

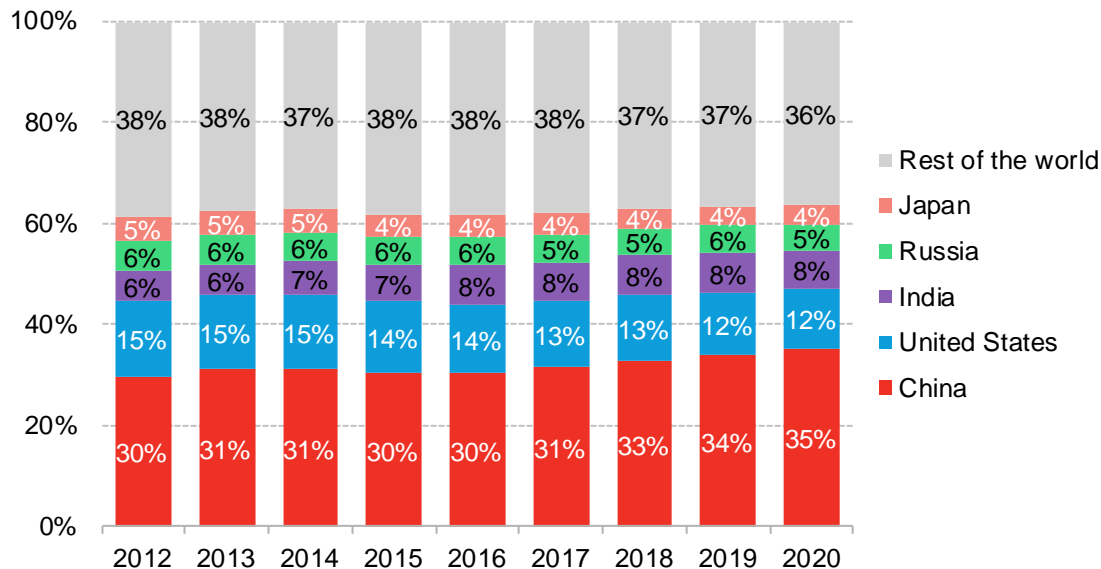
Developed nations' emissions have dropped nearly 25% over the past eight years. Coal accounted for most of the change, with emissions from the fuel falling from 67% of total share in 2012 to 60% in 2019 and 57% in 2020. This was due to the retirement of plants.

Developing nations' emissions have trended up sharply in the past decade but did slip 0.8% from 2019 to 2020. Coal accounts for three-quarters of power sector emissions in these markets.

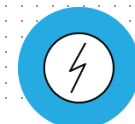
Source: BloombergNEF. Note: power sector emissions are estimated.

Five countries account for nearly two thirds of all power sector emissions

Estimated share of power sector emissions by country



Source: BloombergNEF.



Power



Transport



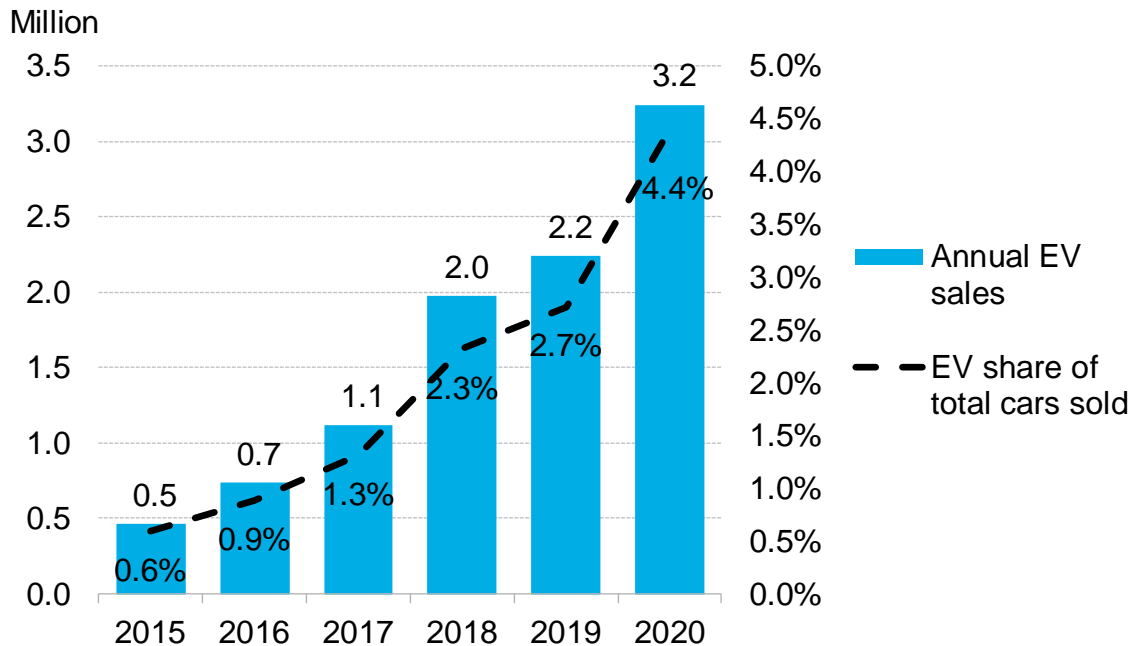
Buildings

China, the U.S., India, Russia and Japan are responsible for nearly two thirds (64%) of global power sector emissions.

While emissions remained flat or slid slightly 2019-2020 in most nations, they rose in China. The importance of the 1% growth in the country was magnified by the fact that China on its own accounts for just over a third of all global power sector CO₂.

Global passenger electric vehicle sales have tripled in four years

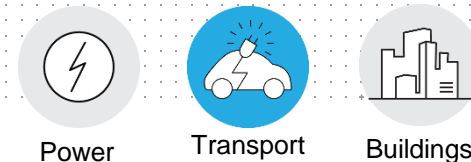
Global EV sales (left axis) and share of EV's vs. total car sales (right)



Source: BloombergNEF. Note: includes BEV and PHEV.

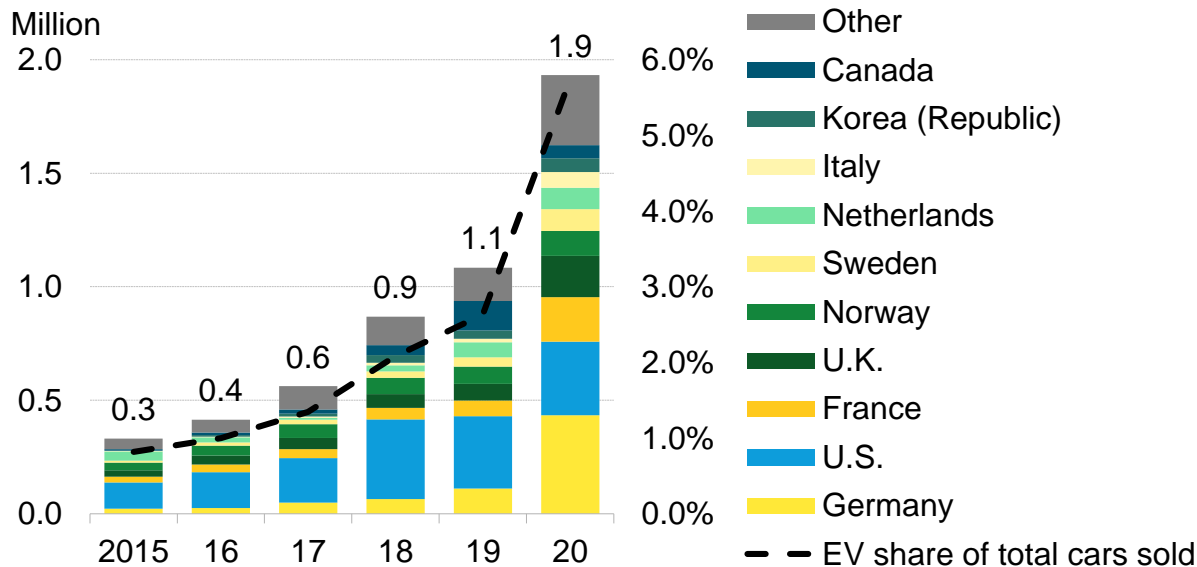
Global passenger EV sales reached 3.2 million in 2020, a tripling from 2017. From 2019 to 2020 alone, annual sales spiked 45%. BNEF expects 2021 to be yet another record with 5.6 million sold in total.

EV sales accounted for 4.4% of global car sales in 2020. This is up from 2.7% in 2019 and just 0.6% in 2015. Record high EV sales in 2020 put a dent in sales of internal combustion engine (ICE) vehicles. These were down 16% globally in 2020, allowing for EVs to gain market share.



EV sales in developed nations jumped almost 80% in 2020

EV sales in developed markets (left axis) and share of EV's vs. total car sales (right)



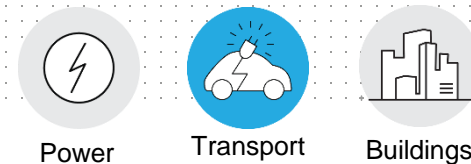
In developed nations, annual EV sales jumped 78%, from 1.1 million in 2019 to 1.9 million in 2020. Sales have more than tripled since 2017.

Thanks to a boom in 2020, Germany accounted for 22% of global EV sales. German EV sales nearly quadrupled in just a year, from 110,000 in 2019 to 433,000 in 2020. The U.S. followed with 325,000 in 2020.

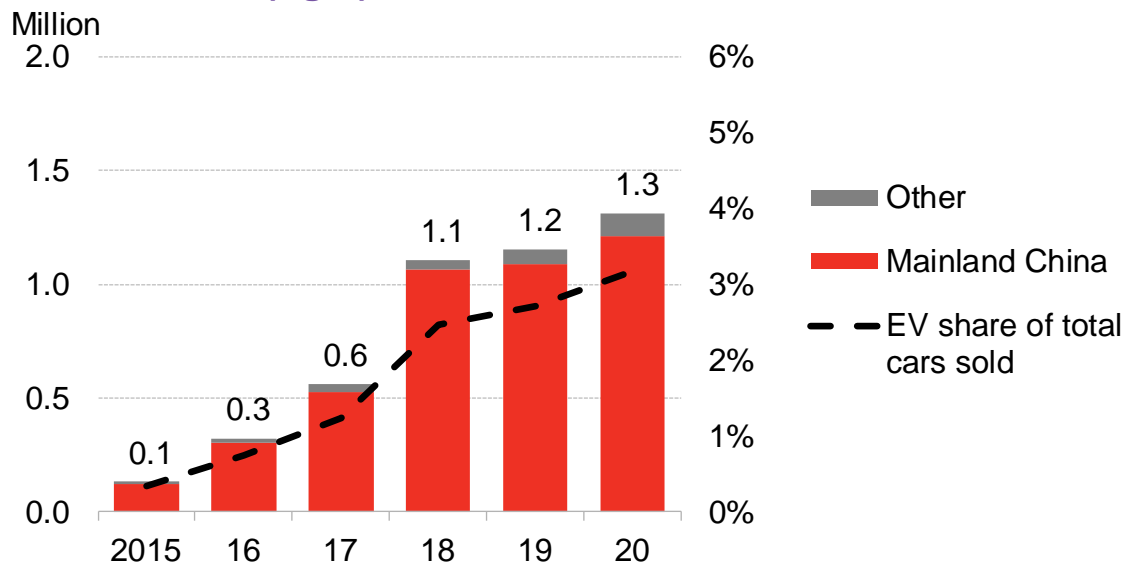
EV's reached nearly 6% of total car sales in developed nations in 2020. This was up from 2.6% in 2019 and just 1% in 2016.

Source: BloombergNEF. Note: includes BEV and PHEV. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other economies..

Emerging market EV sales are highly concentrated in China



EV sales in developing markets (left axis) and share of EV's vs. total car sales (right)



Source: BloombergNEF. Note: includes BEV and PHEV. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other economies.

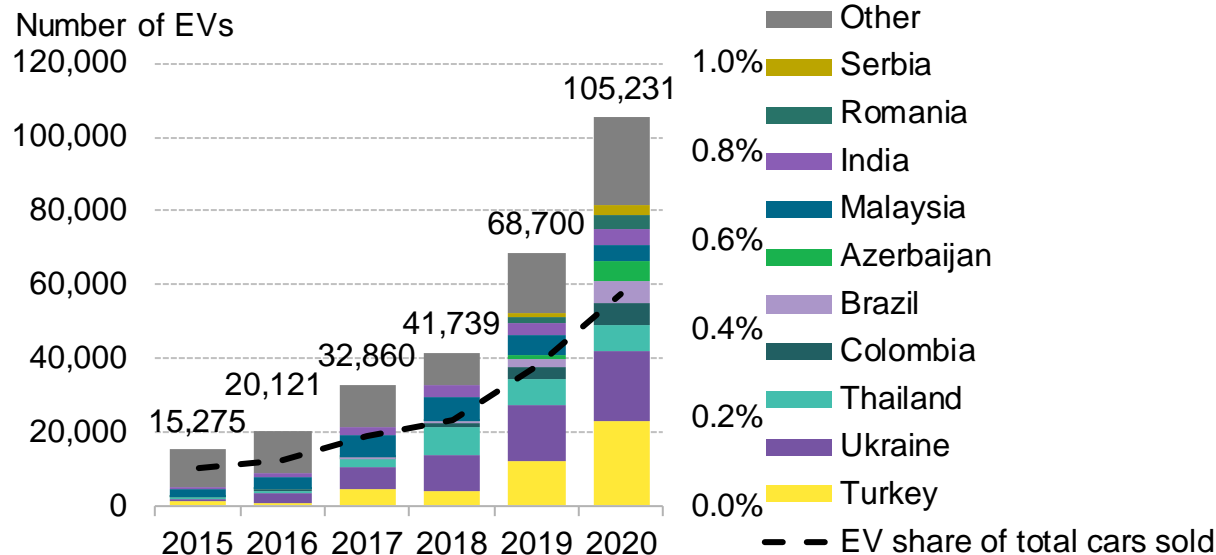
China accounted for 92% of 2020 EV sales in emerging markets with 1.2 million vehicles sold. Since 2015, the country has seen 4.3 million such vehicles sold, more than the top 10 developed markets for electric vehicles combined.

But EV sales growth has decelerated in China recently. Annual sales in the country nearly doubled in 2017-2018, but rose just 15% 2018-2020.

Other emerging markets are a tiny share of total global EV sales, but their progress should not be overlooked. In 2020, these nations accounted for just 3% of global EV sales and 8% of sales among developing nations. However, the number of units sold in these nations jumped over 50% 2019-2020.

EV sales in other emerging markets surpassed 100,000 for the first time

EV sales in developing markets excluding China (left axis)
and share of EV's vs. total car sales (right)



Emerging markets (excluding China) saw a steep growth in EV sales 2019-2020 to just over 105,000 units. This represented a 51% spike from 2019 and a three-fold jump since 2017.

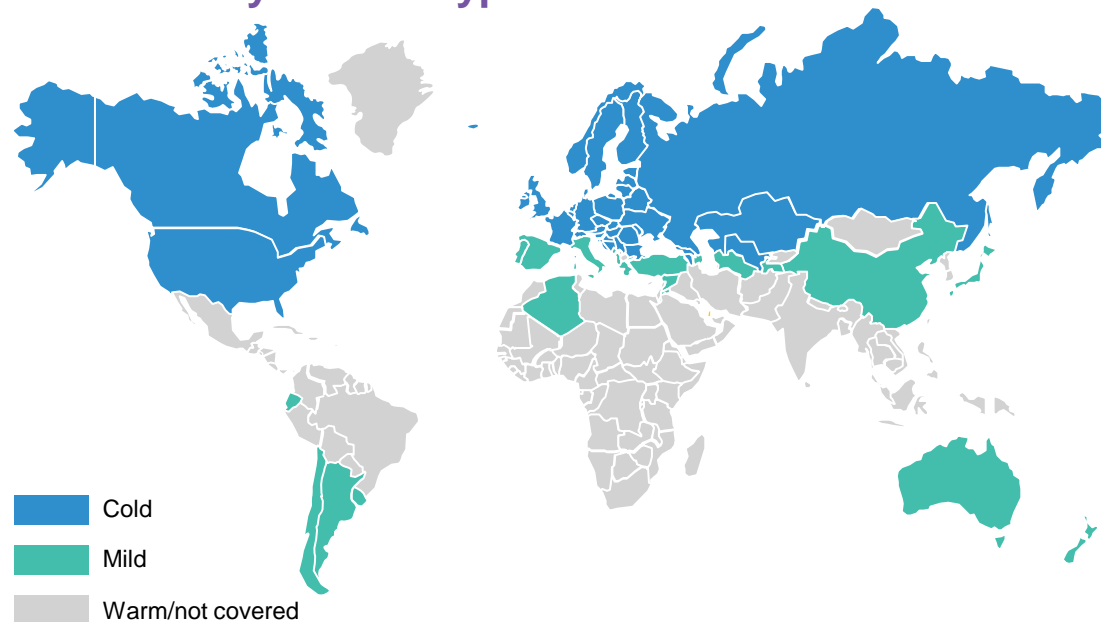
Turkey, Ukraine and Thailand are the biggest EV demand markets among developing nations. Together, these countries accounted for nearly half of emerging markets' 2020 sales.

Despite some growth, EV sales accounted for less than 0.5% of total vehicle sales in these nations in 2020. This was up from 0.3% in 2019 and 0.1% in 2016, but far below the global average of 4.4%.

Source: BloombergNEF. Note: includes BEV and PHEV. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other economies.

Countries with mild to cold climates have substantial heating needs

Countries by climate type



Power



Transport



Buildings

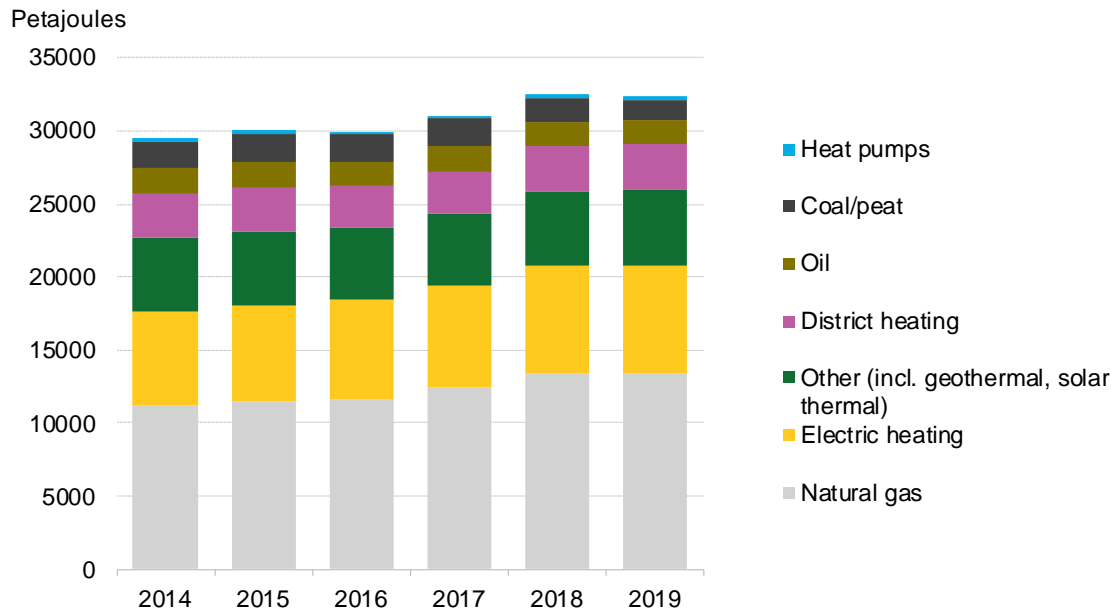
Generating heat for buildings represents a major source of energy demand in nations which can get quite cold, but this is obviously less of an issue in warmer nations. In most countries designated as “cold” (average annual temperatures below 54°F/12°C), a quarter of final energy is used for such purposes with around 15% used in “mild” countries (average temperatures 54-62 °F/12-16.5°C). Decarbonizing heat in these countries could therefore have a great impact of cutting global greenhouse gas emissions.

The Climatescope report and rankings only assess heating data and policies in these designated “heating” countries (shown in blue and turquoise on the map). Countries with warm or hot climates are not covered in this section of the report. Countries not included in the overall Climatescope ranking, or where heating data is unavailable, are also excluded.

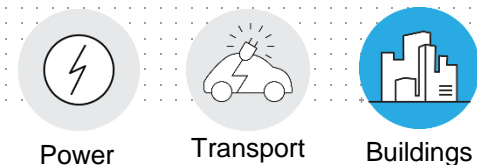
Source: BloombergNEF. Note: Building's share of final energy consumption in cold and mild climates is based on 2018 or 2019 data. Heating needs is based on “heating degree days” data, based on temperatures and the number of days with average temperatures below 62° Fahrenheit (17° Celsius).

The residential heat mix has changed little as demand has grown slightly

Total residential heat consumption



Source: BloombergNEF, Eurostat, IEA. Note: *Heating countries includes 56 cold and mild countries with more than 800 heating degree days per year. Where heating data is lacking, residential energy use is used as proxy and electric heating is assumed to make up 2/3rds of residential electricity consumption.



Total residential heat demand in studied countries* grew around 10% 2014-2019. The additional demand was mainly met by natural gas, and to some extent new district heating.

Natural gas accounted for the largest share of the global residential heating mix with around 39% in 2019, up from 36% in 2014.

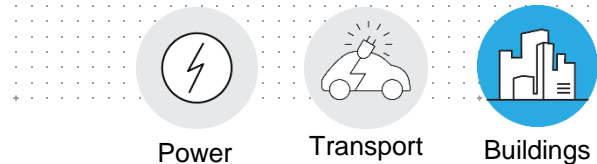
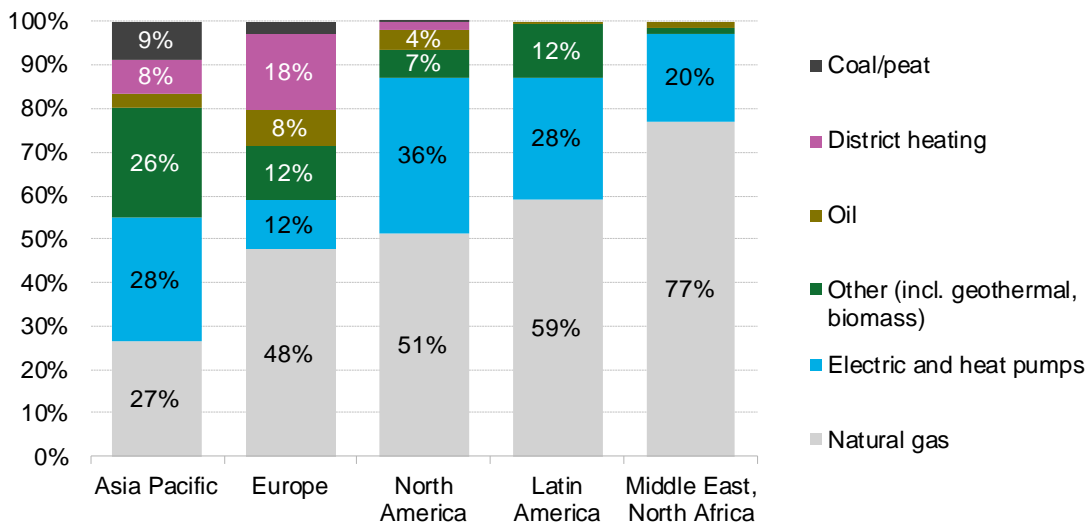
Electric heating, the second-largest source, has remained constant at around a quarter of supply. Electricity is used both for traditional electrical heaters and to power heat pumps, but many countries do not report data on heat pump use. Where heat pump data is reported, their use more than doubled over 2014-19.

Heating from coal, the most polluting fuel, declined by around 25% from 2014 to 2019, but still represents 4% of the heat mix.

Natural gas and electricity dominate residential heating globally

Residential heat mix per region, 2019

Share of residential heating



In Asia-Pacific countries* requiring heat, electricity is the dominant technology, followed by natural gas. Biomass, geothermal and solar thermal together make 26% of residential heat in the region. As much as 9% of heat is produced from coal, which has both high emissions and negative health impacts.

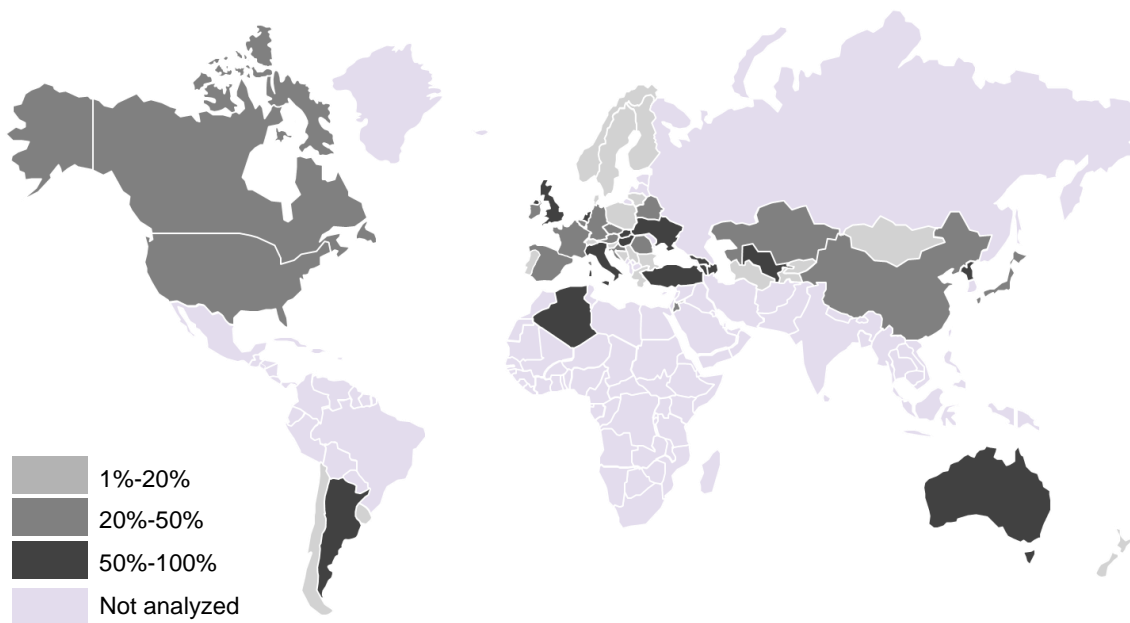
The Americas could benefit from a high share of electricity in heating. With increasing renewable electricity production, electric heating has the best prospects of decarbonizing and heat pumps are easy to install in properties already using traditional electric heating.

Europe has the lowest share of electrical heating, which could be a challenge for decarbonization. However, Europe has opportunities for decarbonizing district heat with large-scale heat pumps, although centralized coal and gas plants currently fuel most of it.

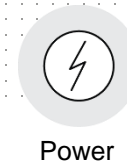
Source: BloombergNEF, Eurostat, IEA. Note: *Heating countries includes 56 cold and mild countries with more than 800 heating degree days per year. Where heating data is lacking, residential energy use is used as proxy and electric heating is assumed to make up 70% of residential electricity consumption

High reliance on natural gas could slow heat decarbonization

Natural gas share in residential heat



Source: BloombergNEF, Eurostat, IEA. Note: Data is based on 2018 or 2019 shares of natural gas in residential heating. Where heating data is lacking, total residential energy use is used as proxy.



Power



Transport



Buildings

Natural gas is the main source of heating in a third of the analyzed heating countries, mostly in Europe, North America and Asia-Pacific, where it provides over 50% of residential heat.

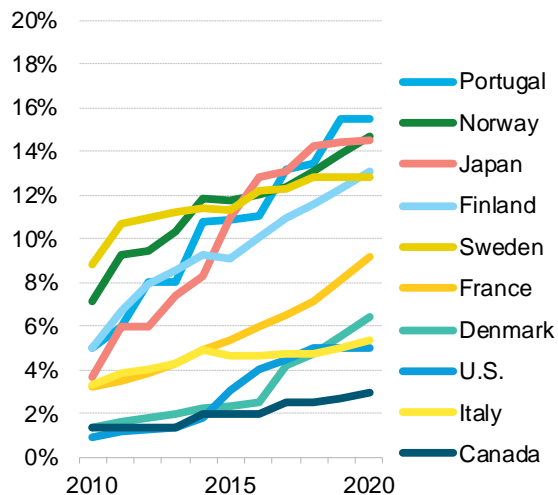
Low-carbon heating technologies, such as heat pumps, increased their share of residential heat over 2010-2019 but gas heating also grew during this time. A key reason is the low price of gas heating, making it a barrier for electrifying heat. Without subsidies, wide adoption of heat pumps pushes the transition costs largely onto households.

Fuel-switching to low-carbon hydrogen is an alternative, but less likely, way of decarbonizing gas heating. Low-carbon hydrogen is likely to first be deployed for industrial purposes, rather than for residential use. To enable residential use of hydrogen, considerable investments would be needed to both individual boilers and gas distribution networks.

European countries and Japan lead residential heat pump growth

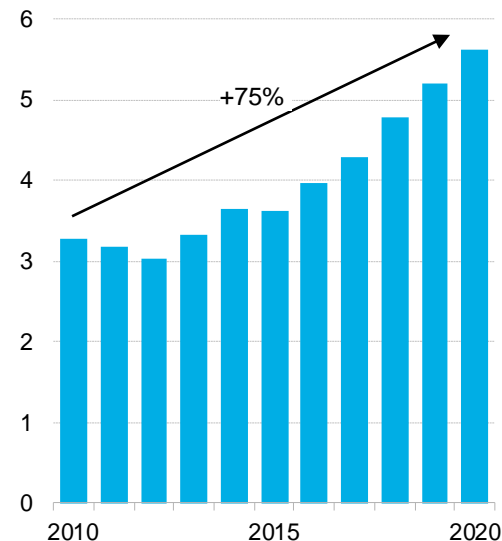
Top 10 countries, heat pump share of heating

Share of residential heat consumption



Europe, U.S., Japan, Korea heat pump sales

million units



Across Europe, the U.S., Japan and South Korea, annual heat pump sales have nearly doubled over the past decade. This includes both air- and ground-source units.

Norway, Portugal and Japan are estimated to have the highest use of heat pumps, able to meet 15-16% of residential heat demand. However, the share could be even higher, as heat pump usage data is often estimated or underreported.

Heat pump uptake usually leads to reduced energy consumption, as a heat pump produces 2-3 times more heat than traditional electric heaters using the same amount of electricity. In very cold countries, such as Canada, the more expensive ground source heat pumps work better but have yet to gain wide popularity.



Power



Transport



Buildings

Source: BloombergNEF, Eurostat, IEA. Note: These figures are estimates, as total heat pump usage is unknown in most markets. Where data is lacking, BNEF has estimated the share of heat pumps based on the number of heat pumps installed and electricity used for heating. Heat pump sales is for 25 countries.

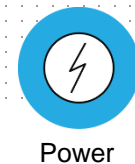
An aerial photograph of a coastal region. On the right side, a city grid with numerous buildings and streets is visible. A river or canal winds through the city and into a large body of water on the left. The water has a greenish tint, possibly due to algae or sediment. The overall scene shows the interface between urban development and natural water bodies.

BloombergNEF

03. Policy

CLIMATESCOPE 2021

89% of emissions are covered by a net-zero target in force or under discussion



Power

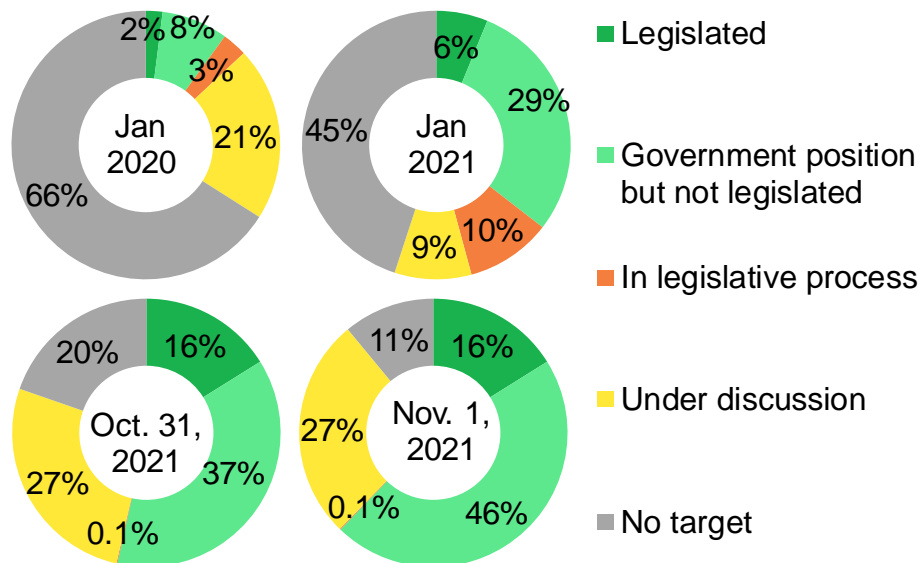


Transport



Buildings

Global greenhouse-gas emissions covered by net-zero targets



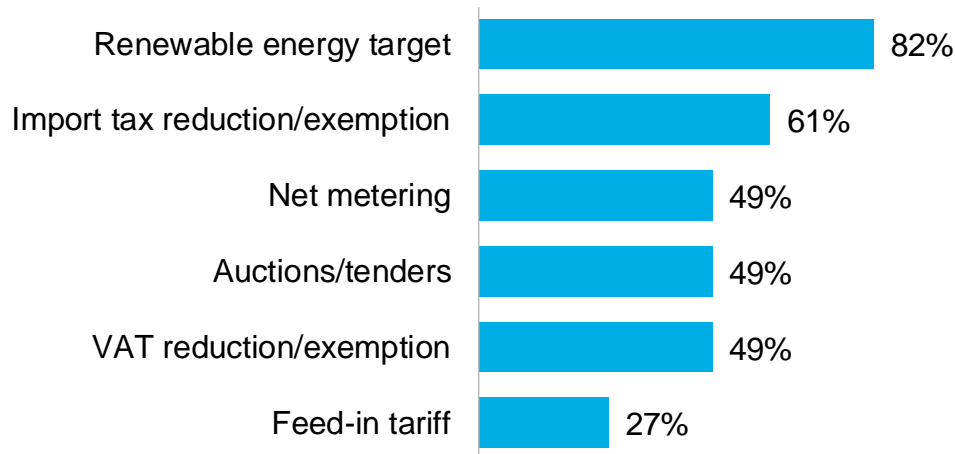
89% of global emissions are now covered by a net-zero target in force or under discussion. This contrasts with 80% on the day before the Glasgow summit began, and just a third in January 2020. Countries responsible for nearly two-thirds of global greenhouse-gas emissions have a net-zero target in force. A further 27% have such a goal under discussion. The surge in these targets was triggered by the Intergovernmental Panel on Climate Change's 2018 report showing that the world must reach net zero by mid-century to limit global warming by 1.5 degrees above pre-industrial levels.

Several major economies made new pledges at COP26. The biggest announcement came from India, which committed to reach net-zero emissions by 2070. Its 2070 deadline disappointed some commentators, but the fact that Prime Minister Modi was willing to make such a commitment is a sign of progress. Southeast Asian countries are also stepping up to the plate in setting long-term climate goals. The four-largest greenhouse gas emitters in the region – Indonesia, Thailand, Vietnam and Malaysia – now have a carbon neutrality or net-zero emission goal between 2050 and 2065.

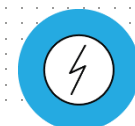
Source: WRI CAIT, BloombergNEF. Note: Includes land use, land-use change and forestry, 2018.

Most emerging markets lack conducive policy environments for renewables

Share of Climatescope emerging markets with a renewable energy policy in place



Source: BloombergNEF, Climatescope. Note: includes 107 emerging markets.



Power



Transport



Buildings

Limited markets have the necessary supportive renewable energy policies in place. Over 80% of the 107 emerging markets surveyed in Climatescope have a renewable energy target, but more specific and effective policies are lacking.

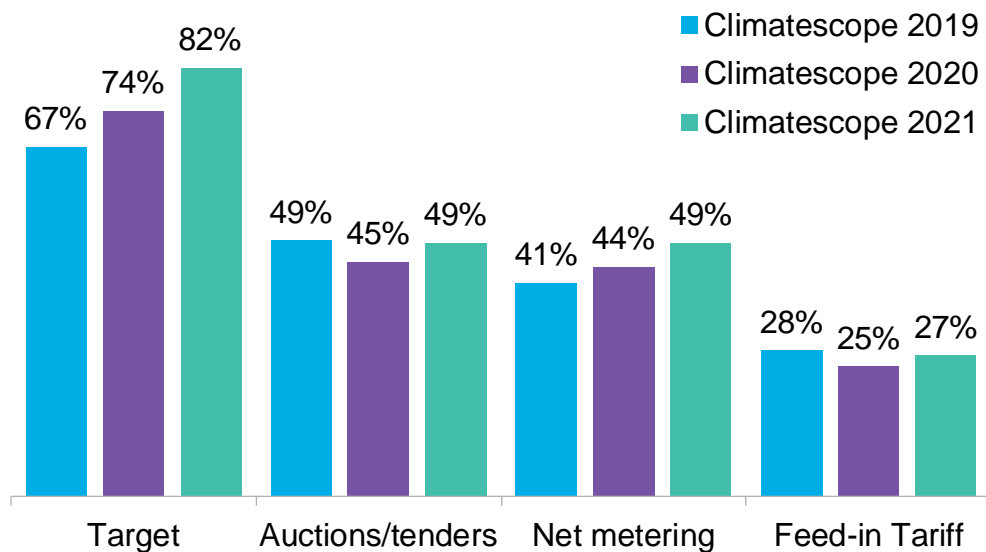
Auctions have proven to be the most effective policy to boost clean energy investment in developing nations, but are in force in less than 50% of the markets. Net metering, one of the key policies to drive deployment of small-scale solar is also available in just 49% of the markets surveyed.

Import tax reductions or exemptions are the second most popular policy in emerging markets, present in 61% of the countries surveyed. VAT reduction or exemptions are present in 49% of the countries.

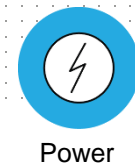
Feed-in tariffs are present in a fourth of nations surveyed. The policy remains highly effective to kick-off new clean energy markets.

Renewable energy targets have been ineffective in influencing other policies

Share of Climatescope emerging markets where renewable policy is present, 2019-2021



Source: BloombergNEF, Climatescope. Note: includes 107 emerging markets.



Power



Transport



Buildings

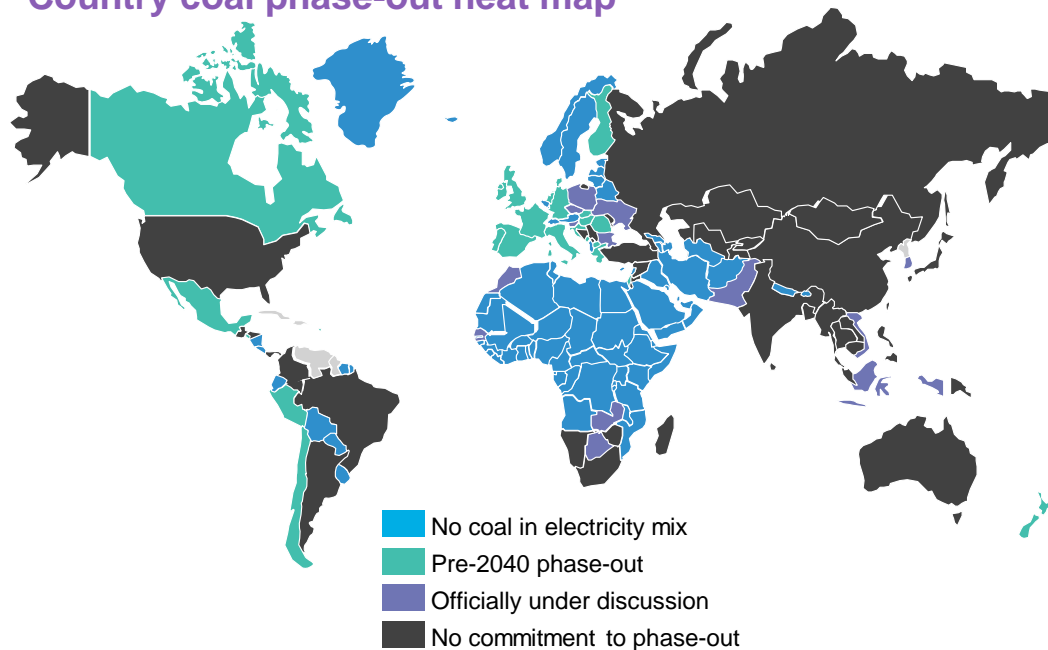
Renewable energy targets have rapidly spread to more emerging markets, but other clean energy policies have not followed the same path. The share of emerging markets with targets in force jumped from 67% in 2019 to 82% in 2021, but implementation of other mechanisms has been weak.

The share of developing nations with auctions and feed-in tariffs in force has remained flat compared to 2019. Over the past three years, less than half of the emerging markets surveyed in Climatescope had auctions in force and just around a quarter of the total had a feed-in tariff mechanism in place.

Net metering has spread to more countries. The presence of the self-generation incentive has grown from 41% of the markets analyzed in 2019, to 44% in 2020 and 49% in 2021. The growth of net-metering incentives is helping distributed solar grow in volume and spread to more nations.

Coal phase-out commitments span over 27 countries

Country coal phase-out heat map



Source: BloombergNEF. Note: "Officially under discussion" refers to pre-2050 targets. Countries in light grey on the map are not covered by BloombergNEF.



Power



Transport



Buildings

Pledges to shut coal-power plants are gaining traction, as at least 27 countries have promised to abandon the fuel by 2040. Over 78 countries never had coal capacity or have already shuttered their fleets.

Nearly all European countries have committed to phasing out coal pre-2040. EU climate targets, emission regulations and carbon pricing have contributed to this.

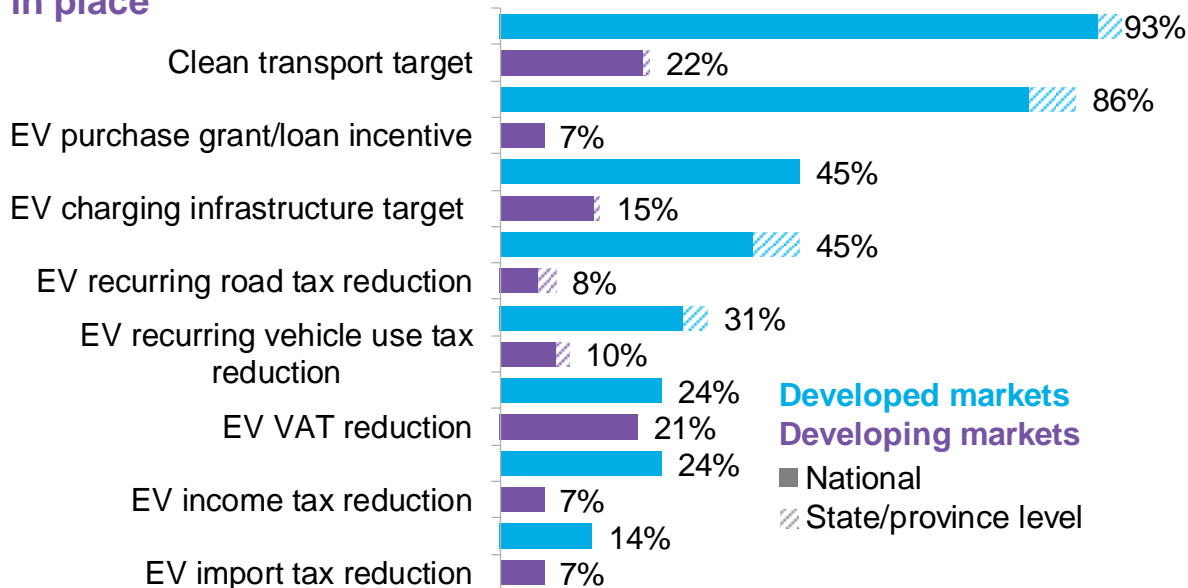
Coal remains king in Asia. That said, South Korea and Vietnam – both in the global top 15 for coal-fired capacity – signed up to the COP26 pledge to phase out coal. Indonesia is also discussing a 2055 phase-out target.

Canada and Chile lead the no-coal ambitions in the Americas. In the U.S., eight states have pledged to ditch coal power.

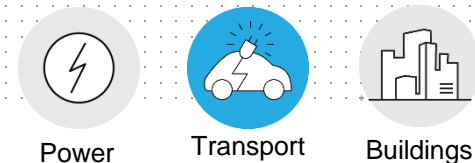
Most of Africa's coal plants are in South Africa. The country has a net-zero by 2050 target. While it has yet to agree to a phase-out deadline, its new \$8.5-billion partnership with the U.K., EU and U.S., announced at COP, aims to help spur its shift away from coal power.

Lack of policies limit EV uptake in emerging markets

Share of Climatescope markets with clean transport policies in place



Source: BloombergNEF, Climatescope. Note: tax reduction incentives include tax exemptions. Developed markets include OECD countries, minus Chile, Colombia, Costa Rica, Mexico and Turkey. Developing markets include all other nations.



Relatively few emerging markets have clean transport policies in force. While 93% of the developed nations surveyed by Climatescope have clean transport targets, just 22% of the emerging markets analyzed do.

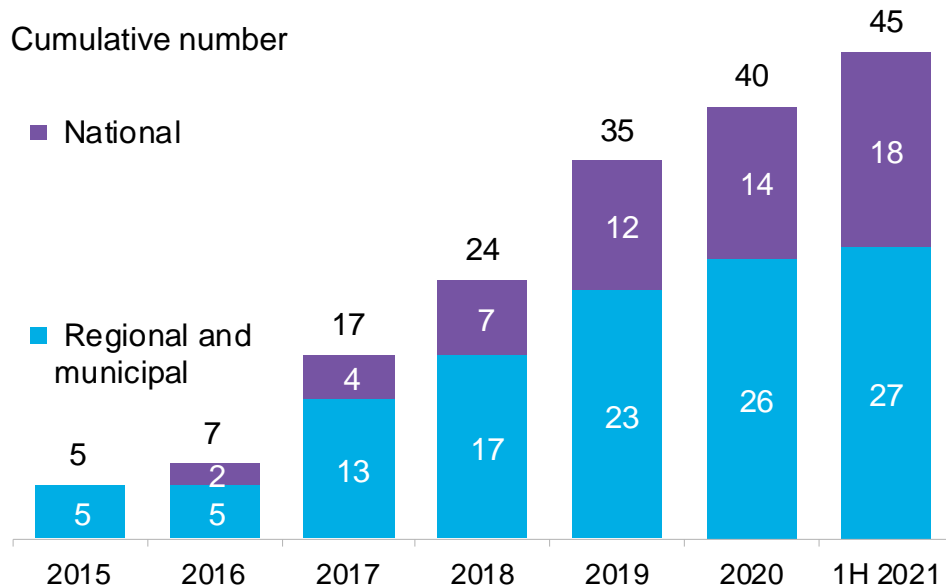
Direct purchase incentives, which lower upfront costs of buying EVs, are effective at kick-starting markets, but are still limited to a small share of developing nations. These are expensive for governments, thus harder to introduce in poorer nations. They typically include EV purchase incentives, EV income tax reductions and EV import tax reductions.

Charging infrastructure policies help lower EV deployment barriers. Nearly half of developed nations have EV charging infrastructure targets in place, compared to only 15% of emerging markets surveyed.

Governments are implementing internal combustion engine phase-outs

National and regional targets to phase out ICE vehicle sales

Cumulative number



Source: BloombergNEF, BNEF *Zero-Emissions Vehicles Factbook*.



Power



Transport

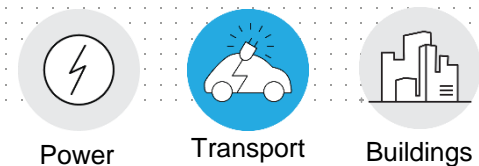


Buildings

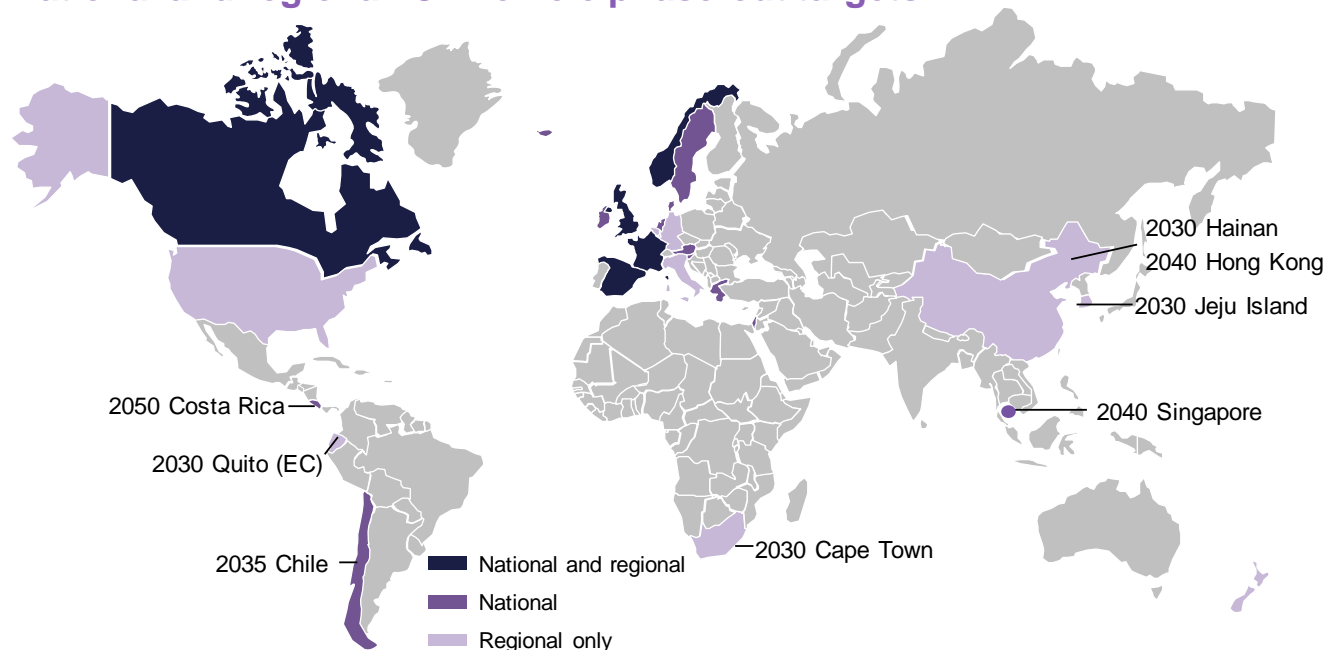
18 national governments have set dates to eliminate internal combustion engine (ICE) vehicle sales. Another 27 regional and municipal authorities have such goals in force. Since 2019, the year of the last COP, the list has grown by six countries to include: the U.K., Canada, Austria, Singapore, Chile and Greece; three U.S. states including California, Massachusetts and New York; and Quebec province in Canada. Not reflected in this figure is the proposal from the European Commission to phase out sales of ICE vehicles in the EU by 2035. This would add 19 more countries to the list.

The importance of regional ICE phase-out targets should not be underestimated. Sub-national targets can drive real impact, especially in countries where national mandates are yet to be implemented. For example, the U.S. currently has no phase-out target nationally, but state-level ICE phase-out targets already cover about 25% of passenger car sales in the country.

Three emerging markets have national ICE vehicle phase-out goals



National and regional ICE vehicle phase-out targets



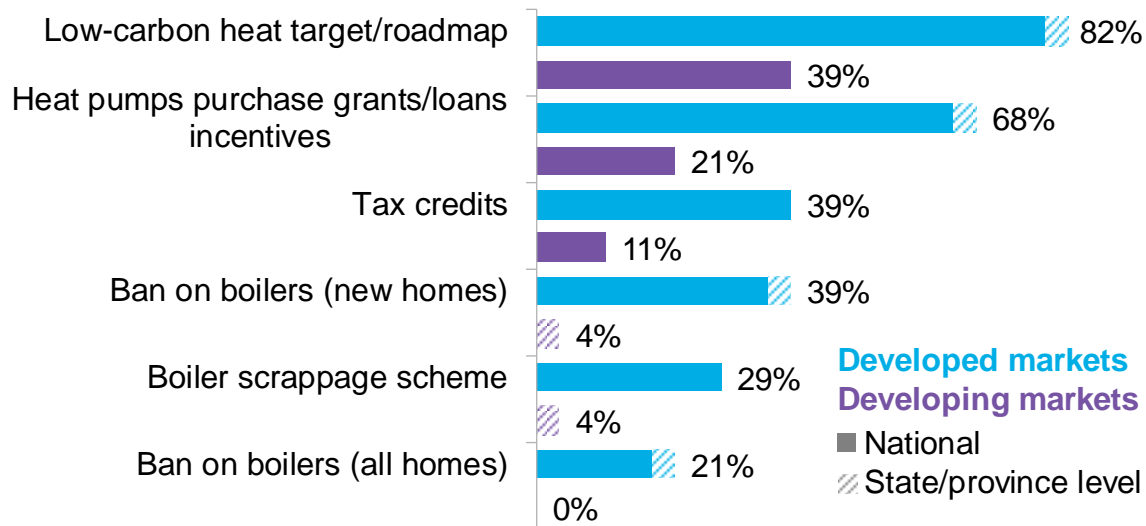
Chile, Singapore and Costa Rica have set national ICE phase-out targets.

Chile aims to reach 100% of passenger electric vehicle sales by 2035. In 2020, the Singaporean government announced an ICE phase-out goal by 2040, while Costa Rica targets 100% of EV sales by 2050.

Source: BloombergNEF. Note: Climatescope surveys 107 emerging markets.

Clean buildings policies are highly concentrated in developed nations

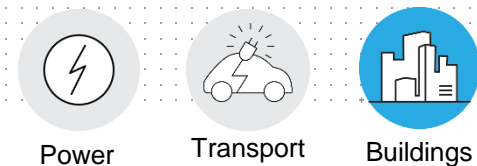
Share of Climatescope markets with a clean buildings policy in place



Three quarters of the clean building policies Climatescope tracked were on the books in developed nations. As with the transport sector, a lack of incentives has limited decarbonization of the sector in emerging markets.

Low-carbon heat targets or roadmaps are the most popular policy mechanisms among countries surveyed. These are present in 82% of developed nations and in 39% of emerging markets.

Grants and loans to purchase heat pumps follow as the second most common policy. The policy is in place in 68% of the developed nations and 21% of the emerging markets.



Source: BloombergNEF. Note: includes 56 countries. Among these, 28 are developed markets and 28 are developing markets.

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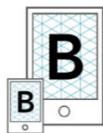
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