2021 Review of Wind Market Fundamentals

BloombergNEF at Wind Power Finance & Investment Summit

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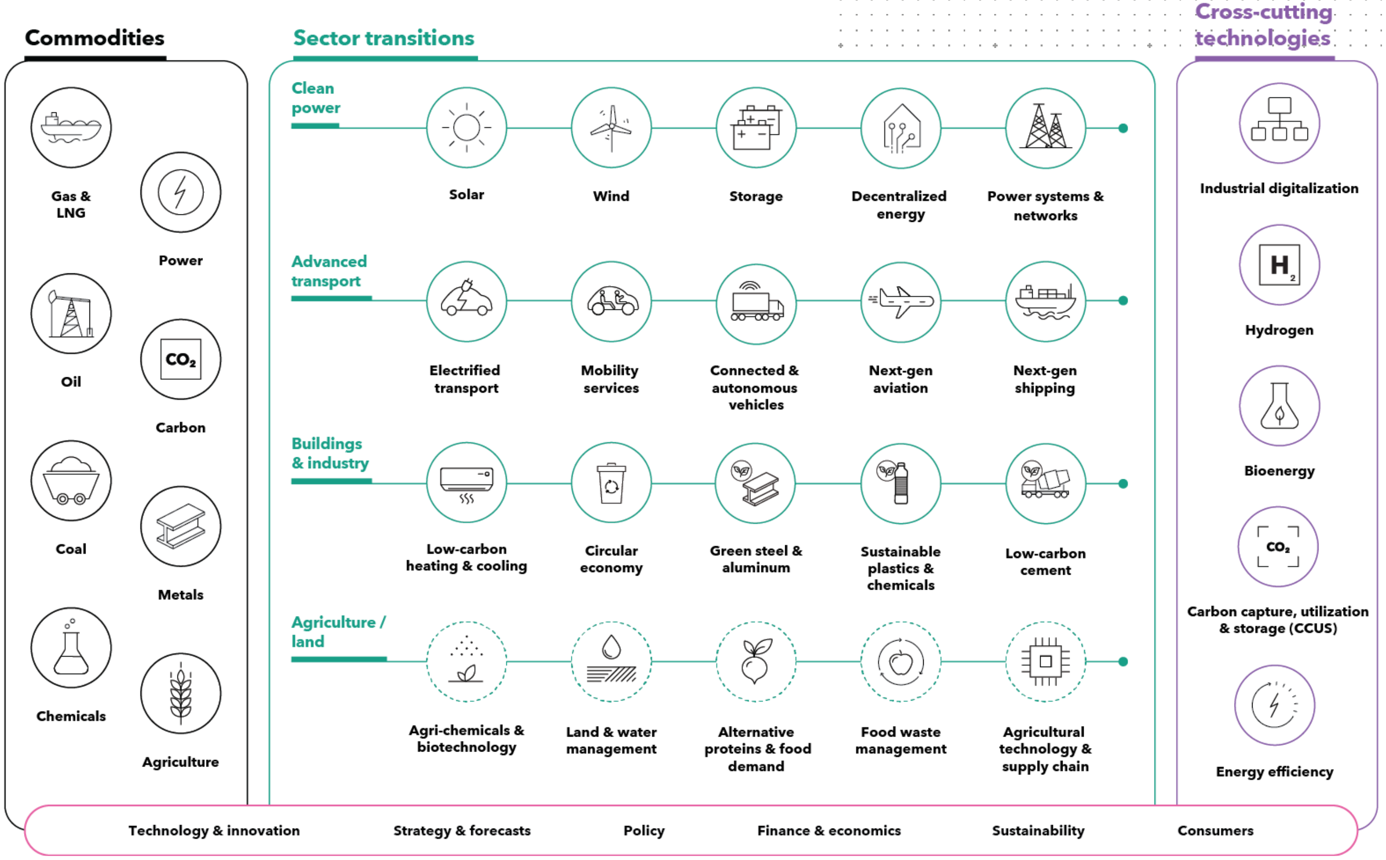
BNEF coverage

Strategies for a cleaner, more competitive future



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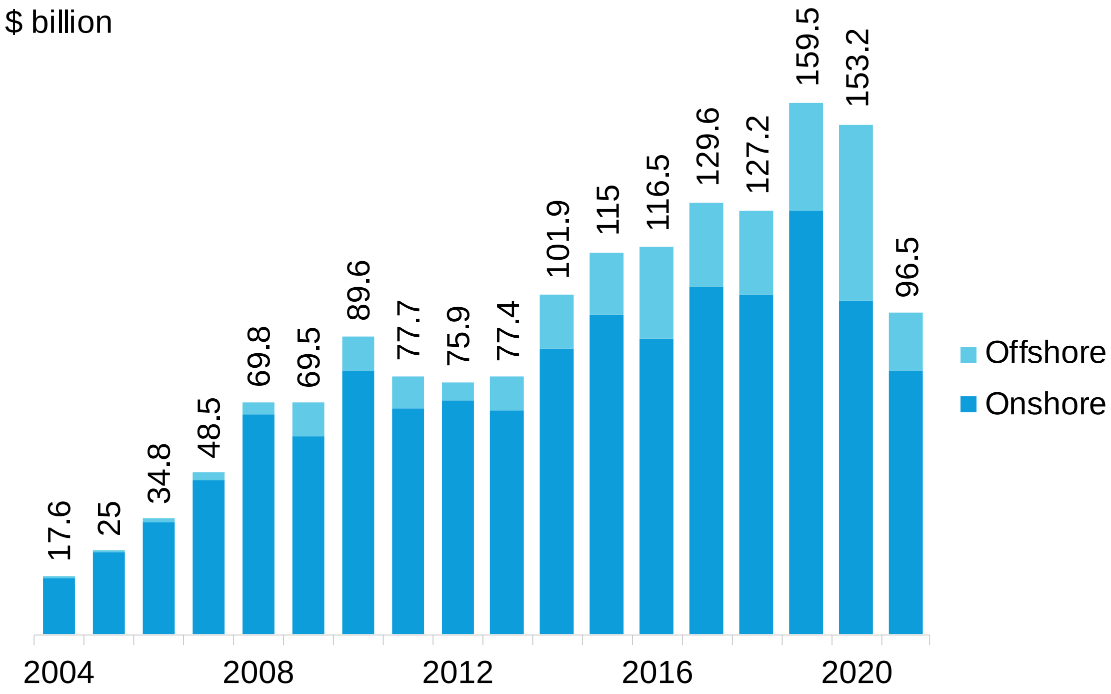
Global wind investment surpassed $150bn for two consecutive years.



Source: BloombergNEF. Note: 2021 inclusive of 1Q-3Q.

- Investment in onshore wind topped $150bn since 2019.
- In 2020, offshore wind investment accounted for 35% of all wind investment, up from 20% the year prior.
- Investment in onshore wind fell 21% between 2019 and 2020, as the pandemic delayed financing to new wind farms.

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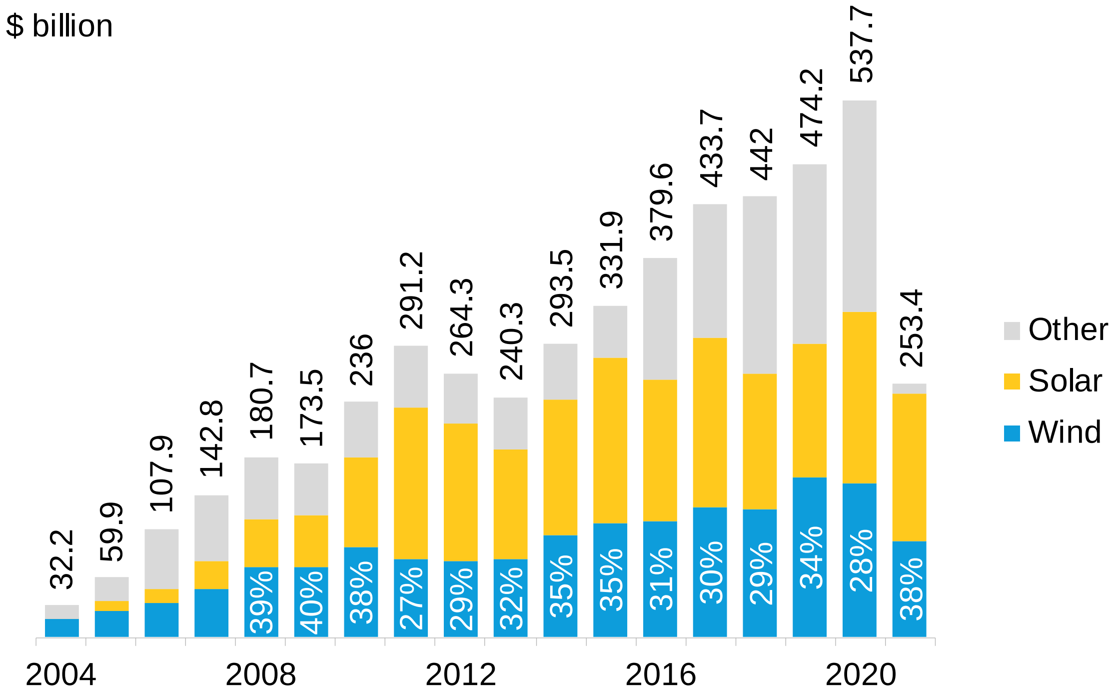
New wind farms accounts for 30% of energy transition investments.



Source: BloombergNEF. Note: 2021 inclusive of 1Q-3Q.

- Investment into energy transition technologies surpassed $500bn in 2020.
- Investment in wind farms typically accounts for around 30% of energy transition investments. Wind and solar together account for more than half.
- Other technologies included in energy transition investments are energy storage, hydrogen, electrified transport, electrified heat and CCS.

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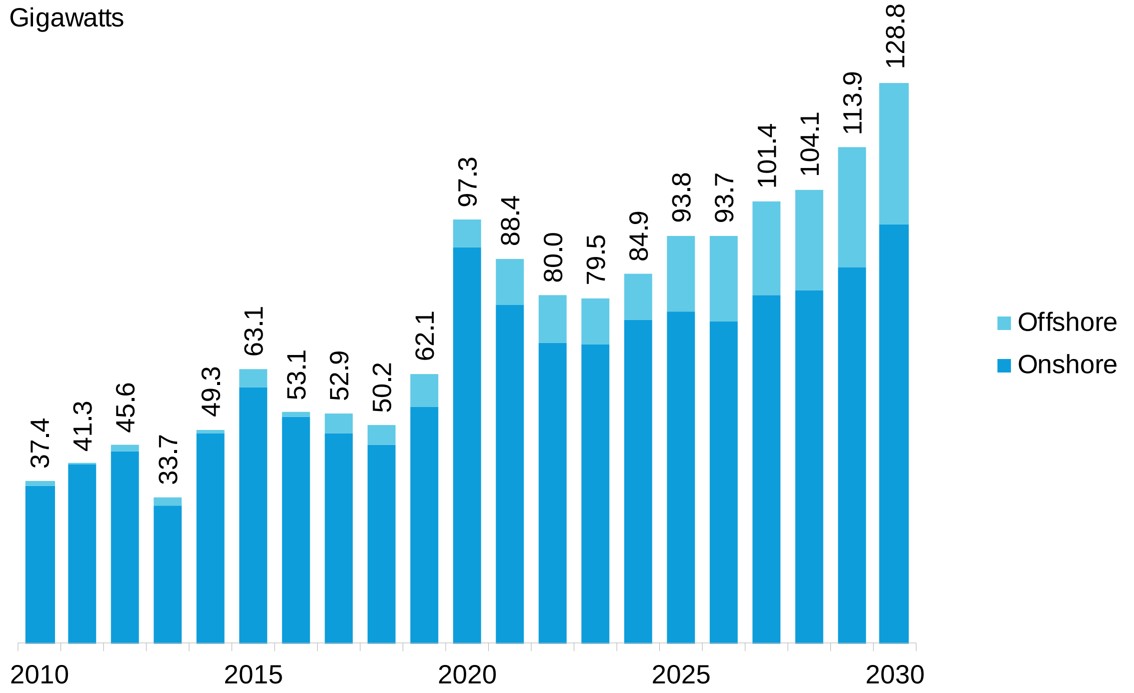
Onshore and offshore installations neared 100GW in 2020, up 57% YoY.



Source: BloombergNEF.

- Record year for installations in 2020 as onshore wind feed-in tariff expired in China, and U.S. production tax credit was due to phase out.
- Installations set to remain high in 2021, as onshore wind installations surge 43% year-on-year in EMEA.
- Out to 2030, annual installations will surpass 80GW each year, growing to nearly 130GW by the end of the decade.
- Offshore wind will account for 25% of new build by 2030.

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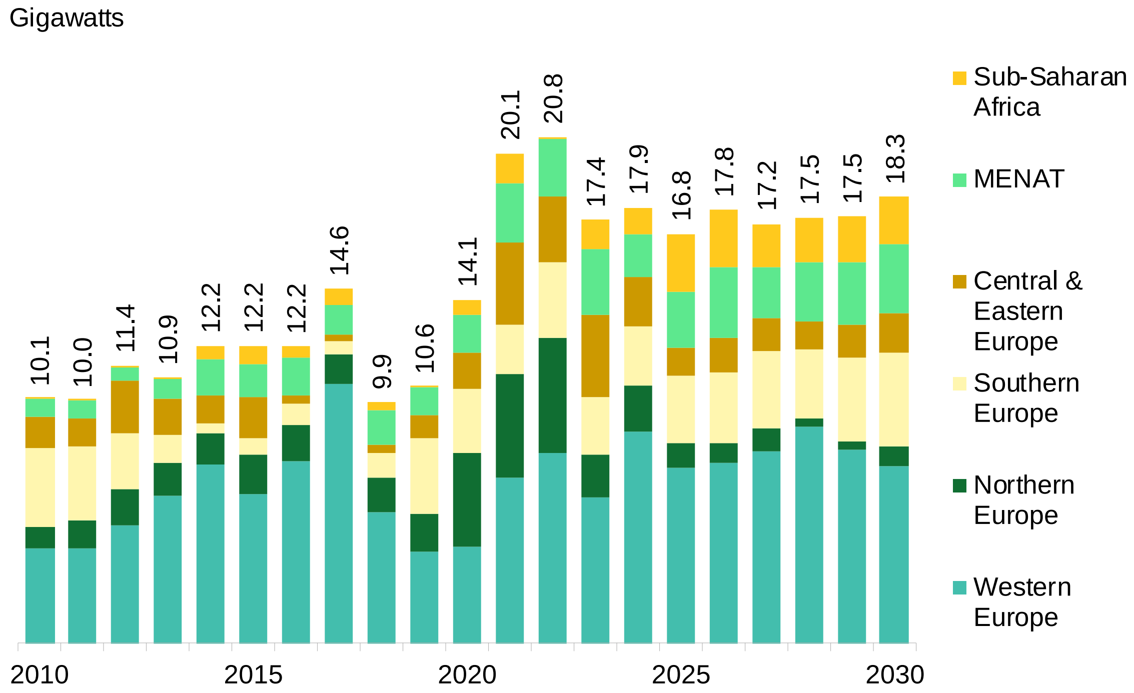
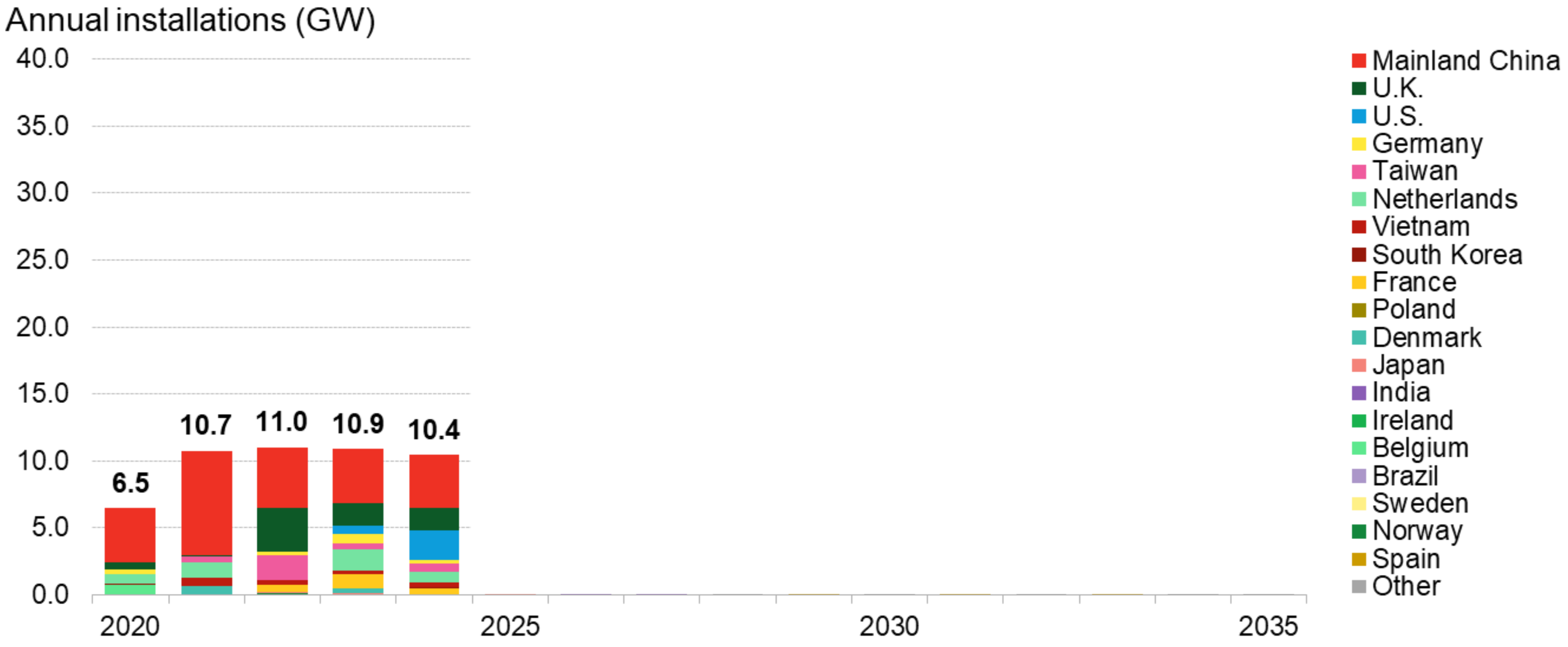
EMEA set for two record-years for onshore wind additions in 2021-22.



Source: BloombergNEF.

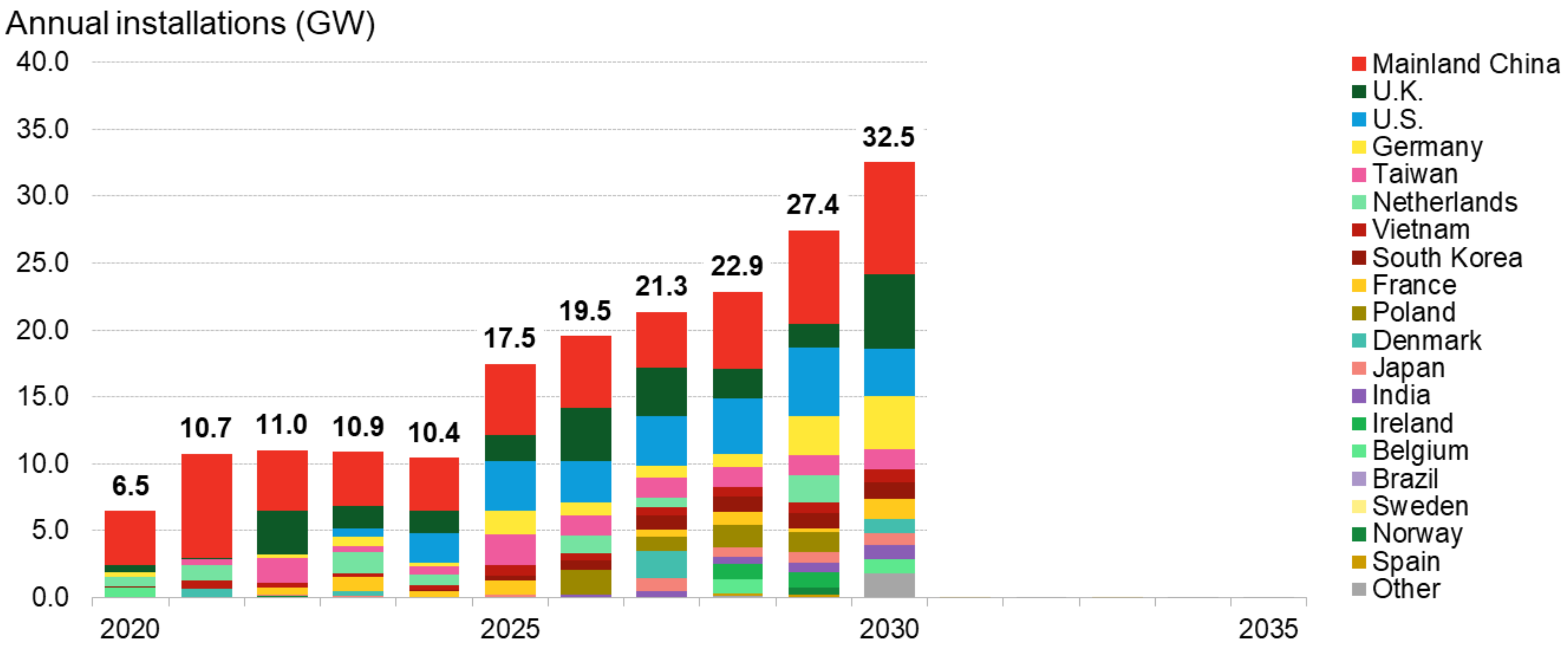
- EMEA is set for two record-years in 2021 and 2022, with onshore installations surging 43%.
- Annual installations to then plateau at 17GW for rest of decade.
- Nordic markets undergo a boom-bust period, adding 12.7GW between 2020-22, but averaging just 1.9GW/year over the decade.
- Middle East & Sub-Saharan Africa will add on average 3.8GW/year over the decade.

Offshore wind installations to plateau around 11GW until mid-decade.



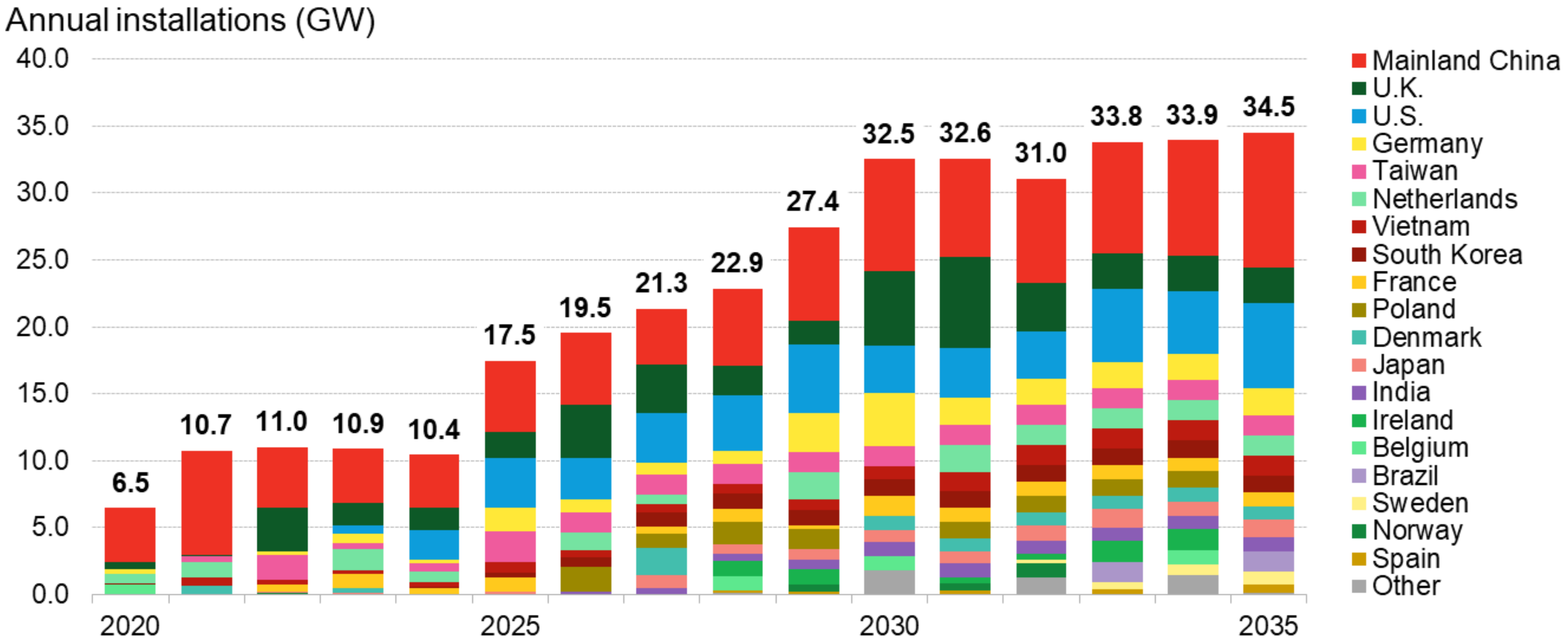
Source: BloombergNEF. Note: ‘Other’ – Portugal, Italy, Finland, Lithuania, Latvia, Estonia and Greece.

Second-half of this decade is when build in new markets picks up.



Source: BloombergNEF. Note: 'Other' – Portugal, Italy, Finland, Lithuania, Latvia, Estonia and Greece.

By 2035, annual installations are 3x higher than today.



Source: BloombergNEF. Note: 'Other' – Portugal, Italy, Finland, Lithuania, Latvia, Estonia and Greece.

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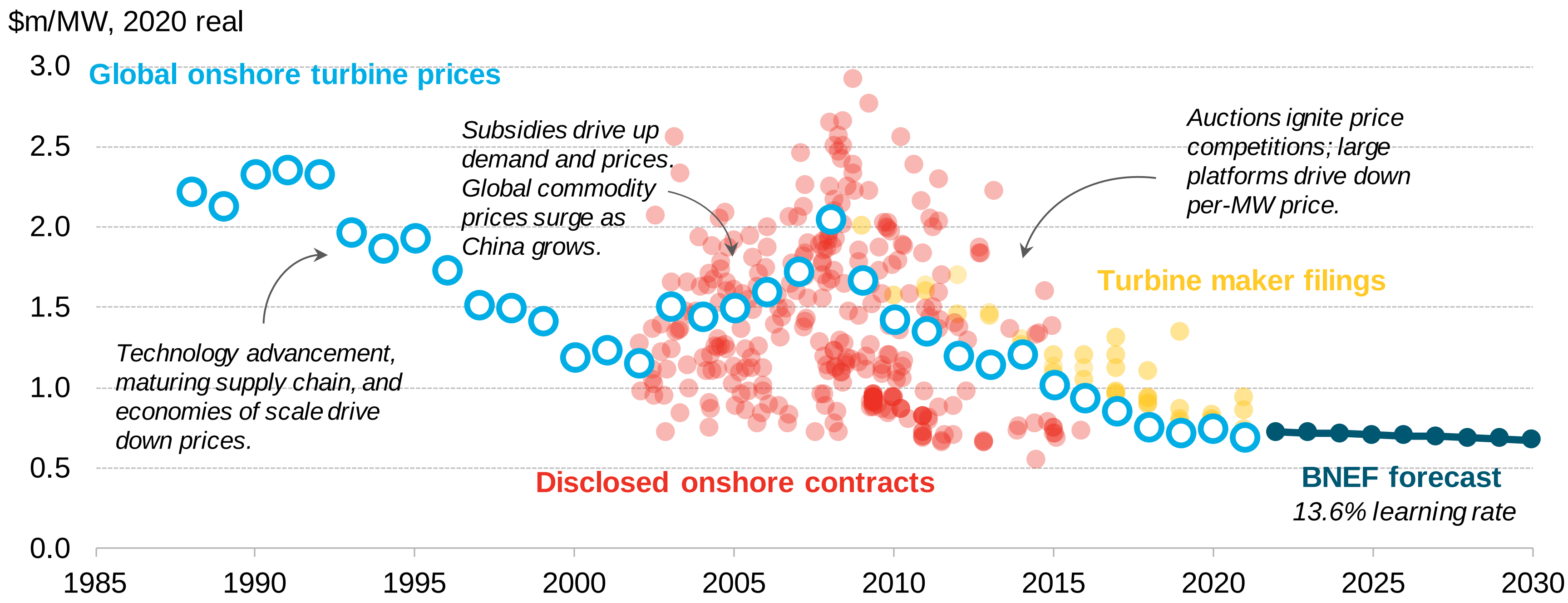
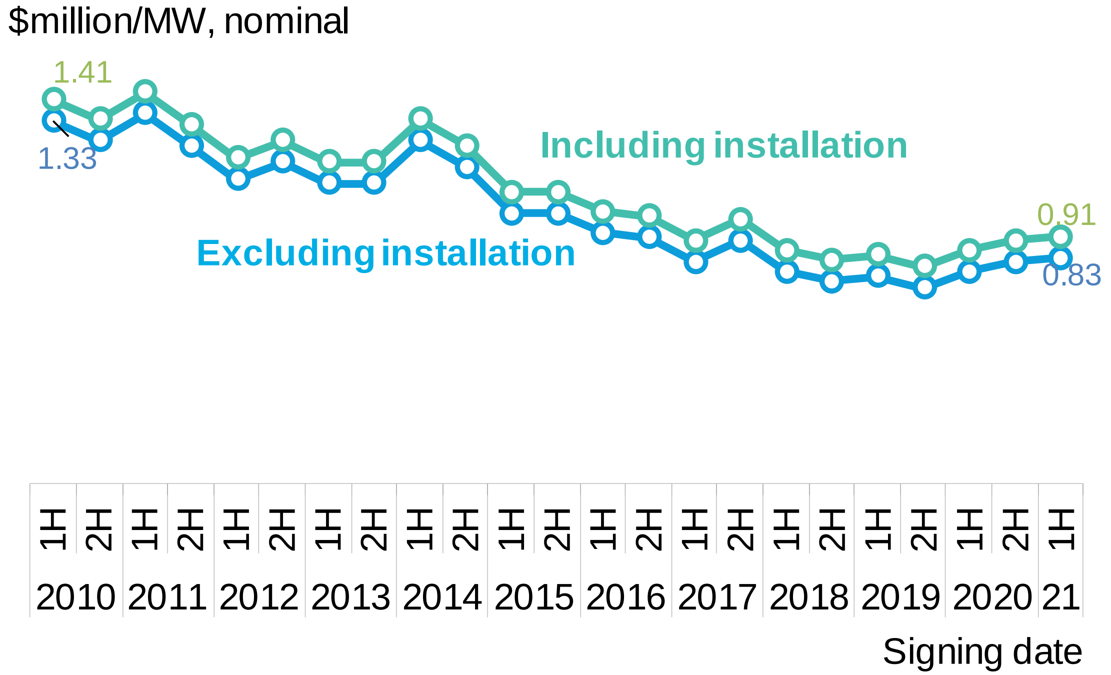
Global onshore wind turbine prices converge, further reduction predicted.



Source: BloombergNEF, Lawrence Berkeley Laboratory (LBL), ExTool (Germany and Denmark), turbine maker company filings. Note: Onshore wind turbine prices only. Turbine manufacturer data points calculated from company filings, typically 'order intake value / order intake MW'. Prices converted to dollars using USD FX rate on day, or year, of order, then values were converted to real USD. Price by contract signing date and company fillings' publication date.

Onshore wind turbine price at $830,000/MW.



Source: BloombergNEF. Note: U.S. turbine supply contracts typically excludes installation and commissioning cost. European and Latin American turbine supply contracts typically include installation and commissioning costs.

- In dollars, the global average price for contracts signed in 1H 2021 was $0.83m/MW without crane installation.
- We're beginning to see an upward trend in pricing for wind turbines, as shipping costs increase and commodity prices surge.
- Index has a bias towards Western Europe, where turbines tend to be more expensive than in other regions.

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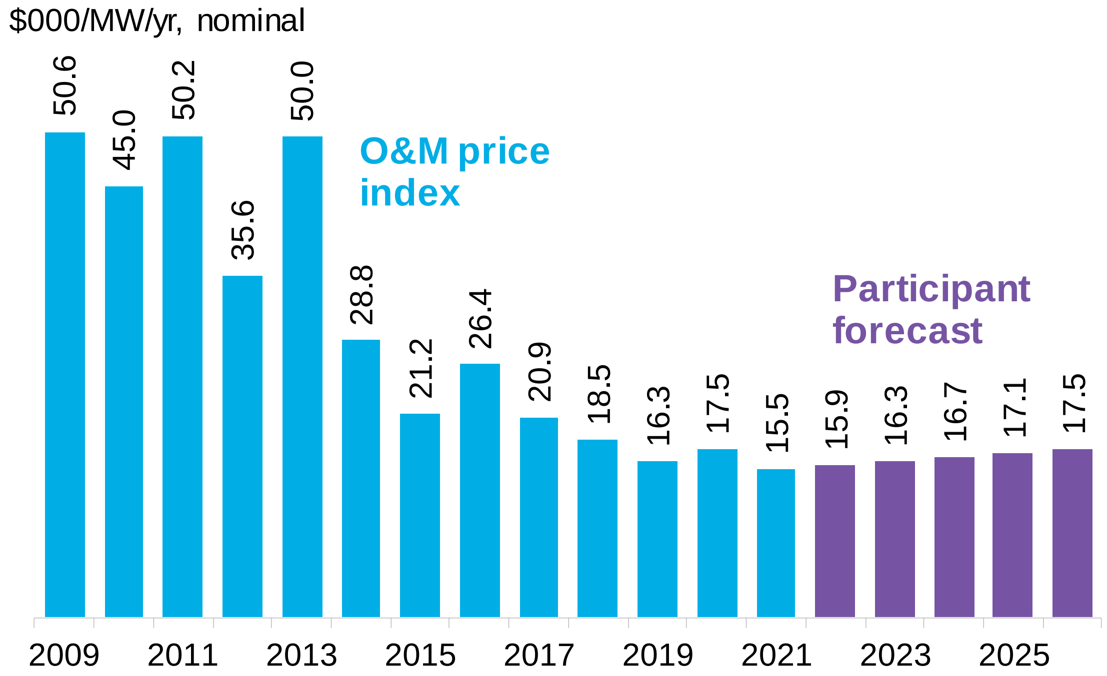
O&M prices resume their fall, but Covid-driven cost increases are coming.



Source: BloombergNEF. Note: Full-service initial contracts only. This includes labor, routine and unscheduled maintenance, minor and major component replacement.

- Full-service agreements include major and minor component replacement, scheduled & unscheduled maintenance.
- Full-service agreements price at $15,500/MW per year for contracts signed in 2021.
- Prices for contracts signed in early 2021 were mostly negotiated the year before. Prices could now increase as service providers pass on higher logistical costs to customers.

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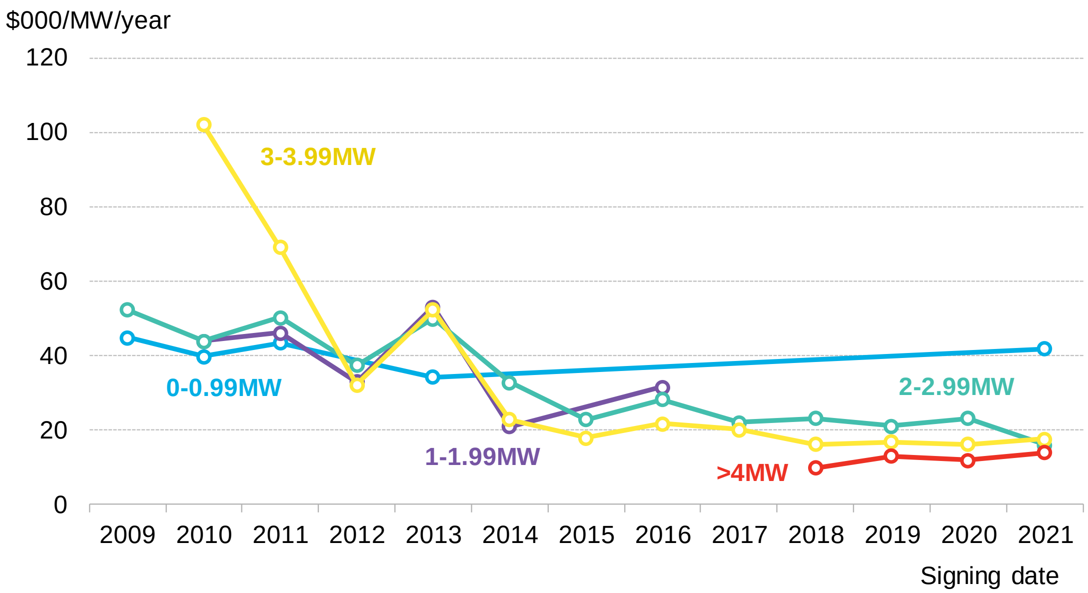
Rising turbine capacity has been the key driver of price reductions.



- Service contracts signed over the last 12 months for the 2-2.99MW turbines were 39% more expensive than for the largest turbines of over 4MW.
- Service deals for older wind turbines, below 1MW, were three times the price on average than deals for turbines over 4MW.

Source: BloombergNEF. Note: Pricing for full-service initial agreements only. This includes routine and unscheduled maintenance, minor and major component replacements and labor.

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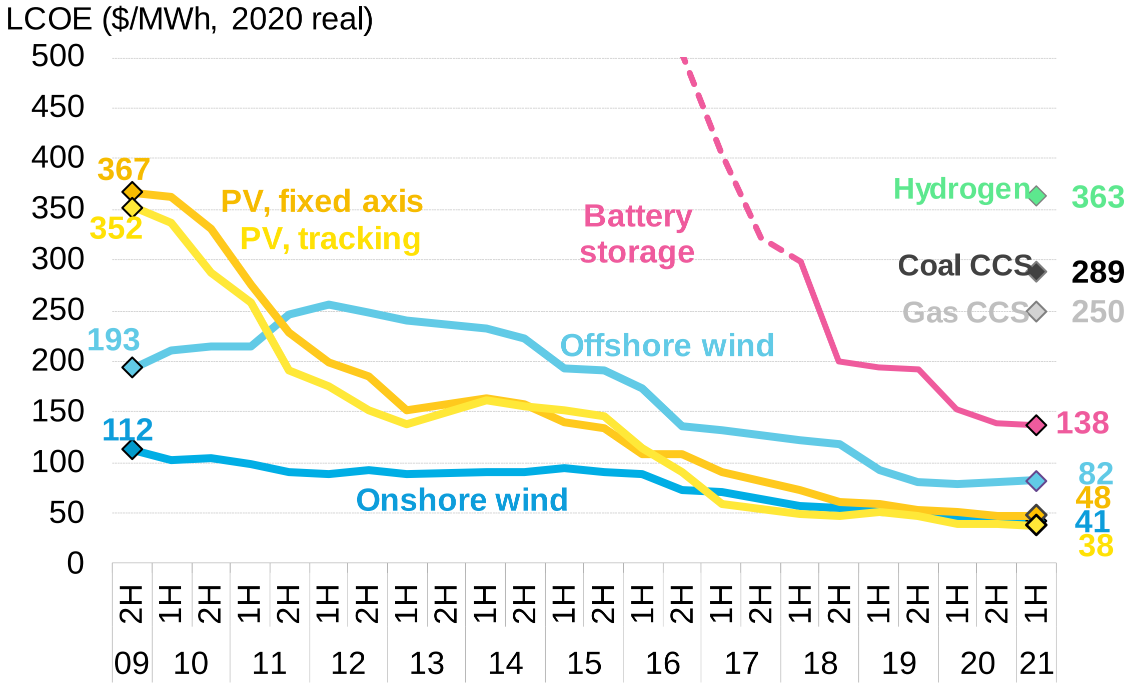
The global LCOE benchmark for onshore wind is $41/MWh, unchanged from 2020.



- The cost of onshore wind has come down 63% in real terms since 2009, to $41/MWh in 1H 2021, unchanged from 2H 2020.
- Rising commodity prices in the first half of 2021 are increasing the cost of materials for power sector technologies, but this has not yet translated into higher global LCOE benchmarks.

Source: BloombergNEF. Note: The global LCOE benchmarks are country-weighted average for PV, wind and storage and simple global averages for other technologies. The storage LCOE reflects a four-hour duration Li-ion system, it includes charging costs.

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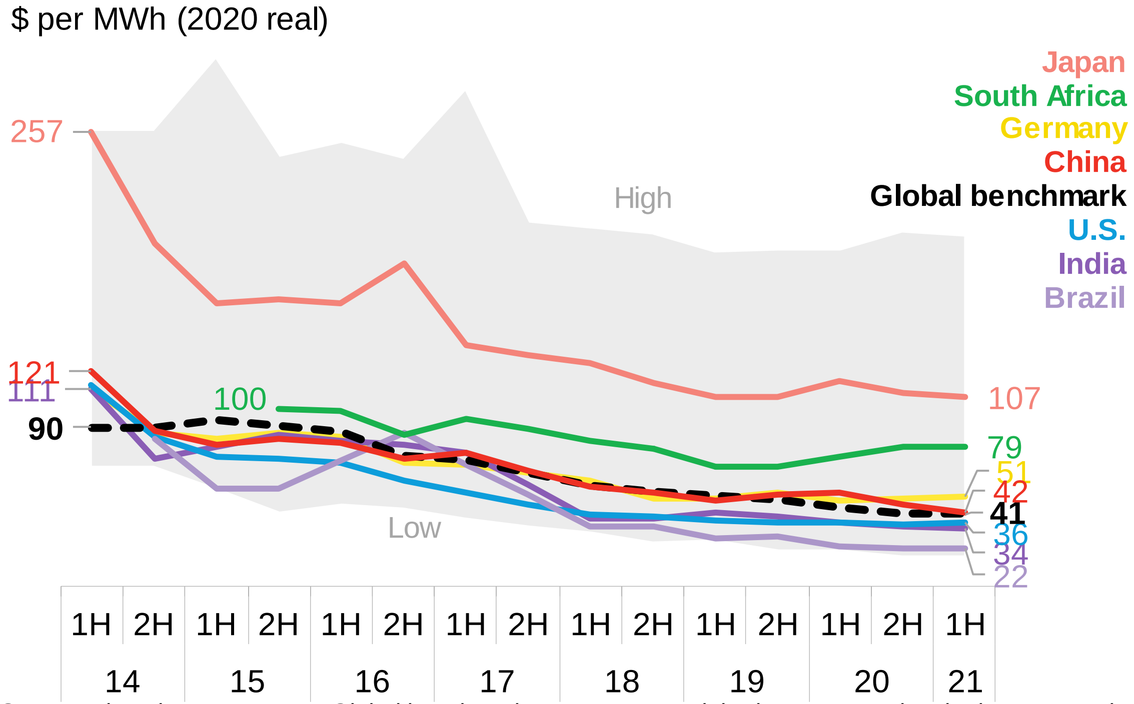
Countries delivering the lowest cost onshore wind between $17-28/MWh.



Source: BloombergNEF. Note: Global benchmarks are country weighed-averages using the latest annual capacity additions. Our U.S. LCOE excludes tax-credits.

- The projects delivering the lowest-cost onshore wind are in Brazil, India, Texas, Canada, Mexico and Spain, between $17-28/MWh.
- Projects in many of these markets benefit from high capacity factors, averaging 50% in Brazil.

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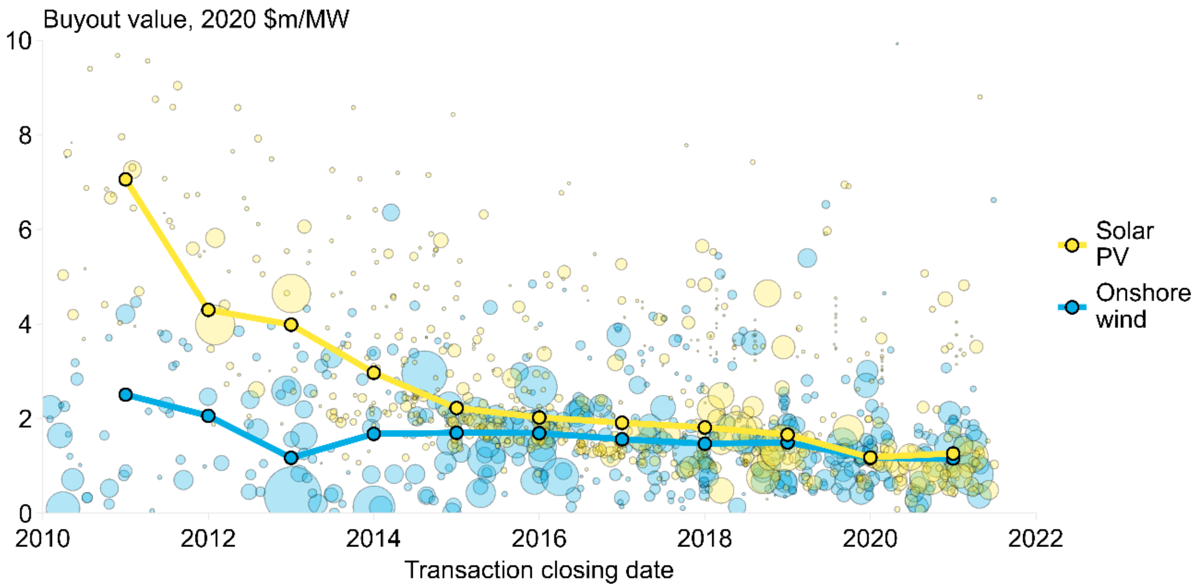
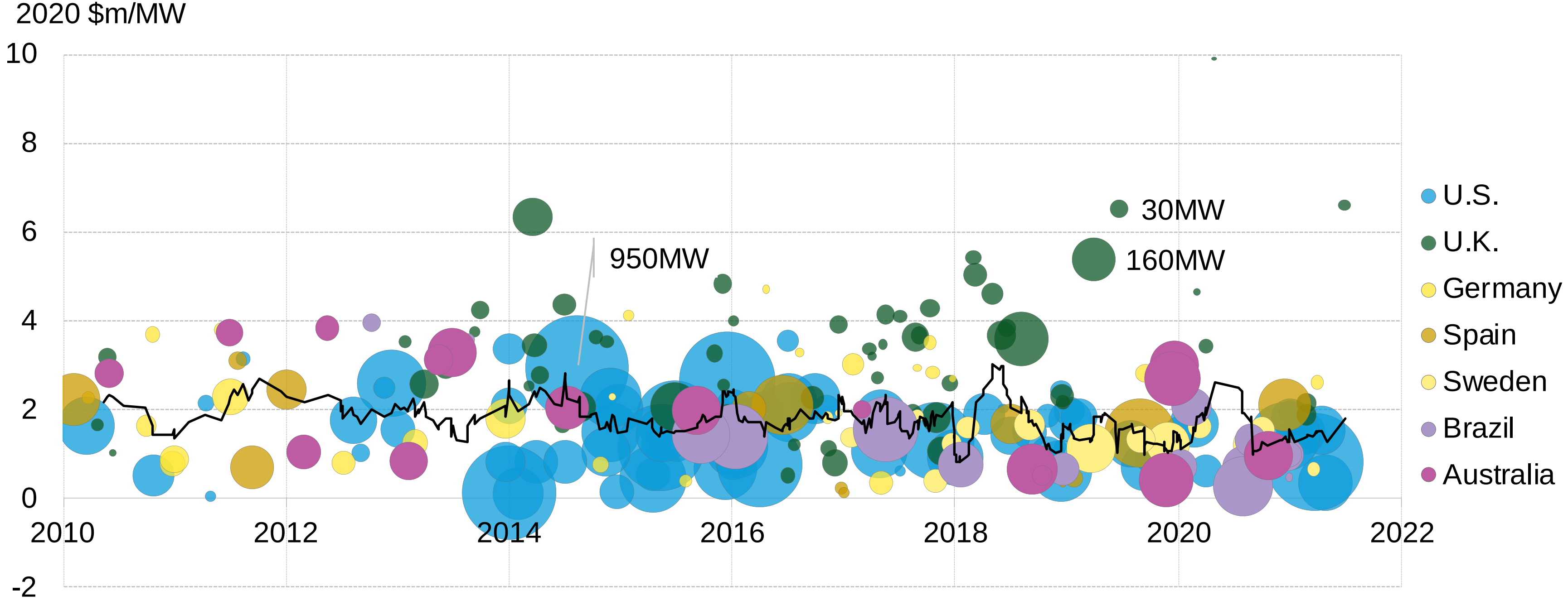
Gap between prices paid for solar and wind has narrowed to just $0.11m/MW.



- Buyout value for onshore wind averaged $1.16m/MW in 1H 2021, falling 53% since 2011.
- Prices for solar sites average $1.27m/MW this year, falling 82% over the decade.
- In 2011, investors paid a premium of $4.5m/MW to acquire a PV asset, but that gap has narrowed to just $105,700/MW this year.

Note: bubbles refer to individual deals for financed and commissioned assets. Line series are capacity-weighted average values.

Onshore wind project values halved in ten years.



Source: BloombergNEF. Note: Size of the bubble represents the size of the project in MW. The line represents a 10 point moving average of deal values, ordered based on closing date. Includes only financed and commissioned projects.

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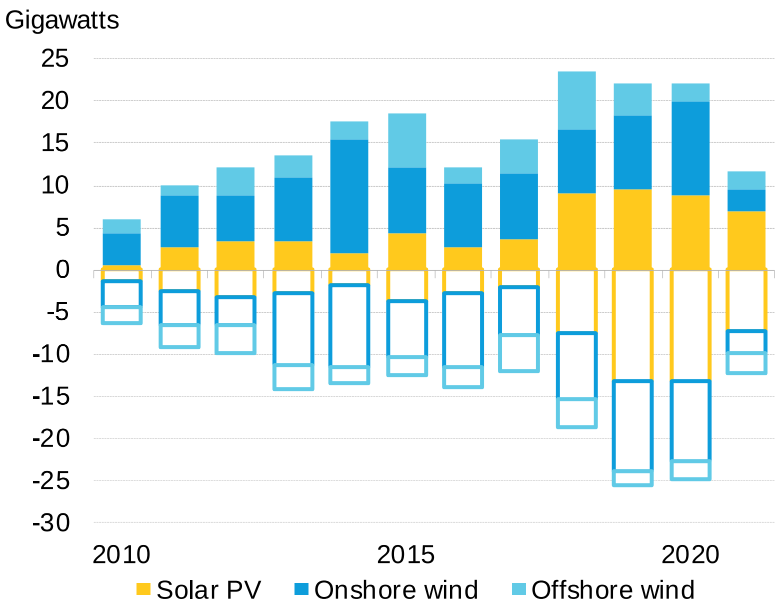
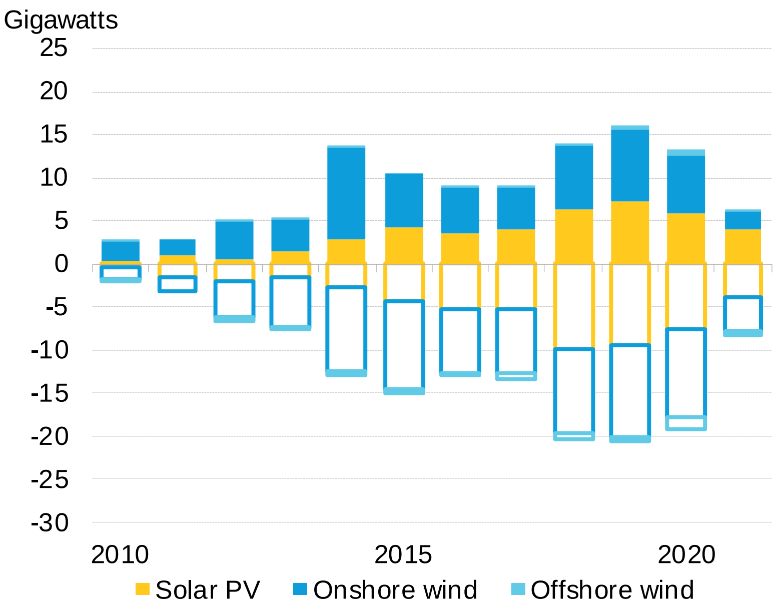
Power firms offload more than 40GW of new capacity per year.

Early-stage transactions



Source: BloombergNEF, Bloomberg Industry Classification Standard. Note: excludes oil & gas. Includes announced and permitted capacity.

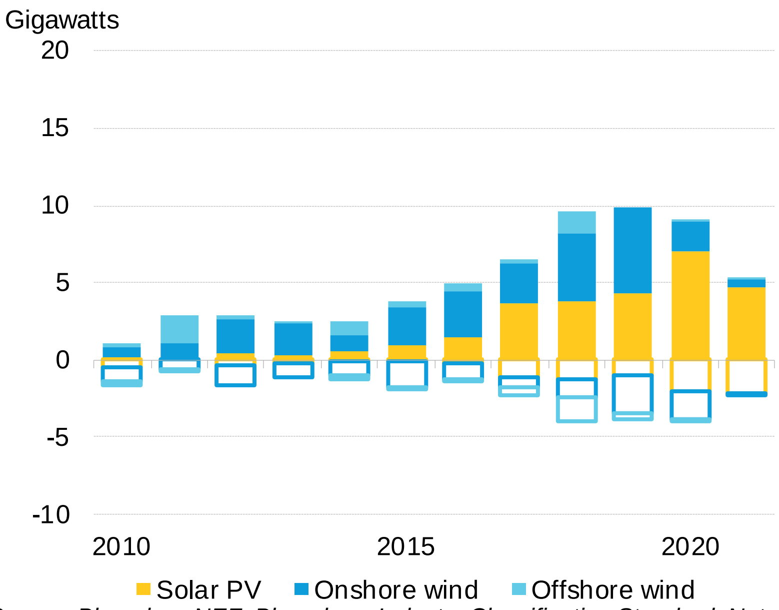
Late-stage transactions



Source: BloombergNEF, Bloomberg Industry Classification Standard. Note: excludes oil & gas. Includes financed and commissioned capacity.

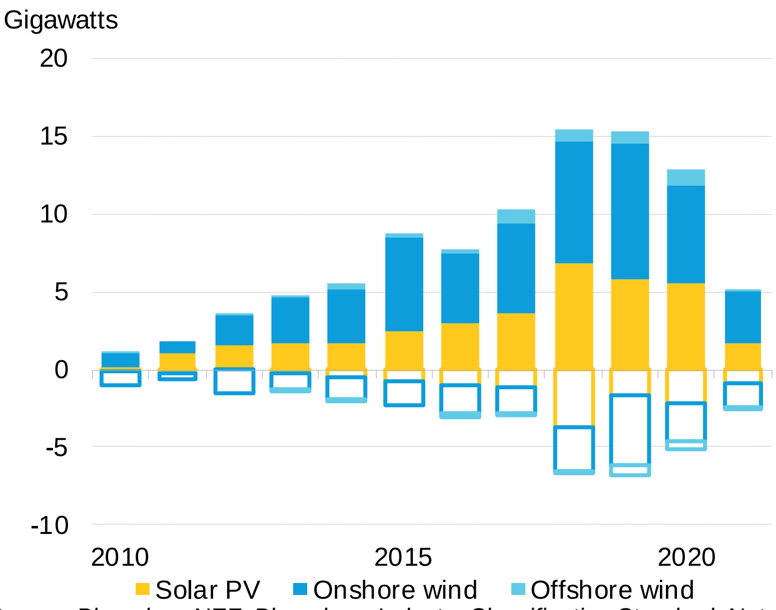
Financial investors acquired 50GW of solar, wind capacity across 2018-19.

Early-stage transactions



Source: BloombergNEF, Bloomberg Industry Classification Standard. Note: Includes announced and permitted capacity.

Late-stage transactions



Source: BloombergNEF, Bloomberg Industry Classification Standard. Note: Includes financed and commissioned capacity.

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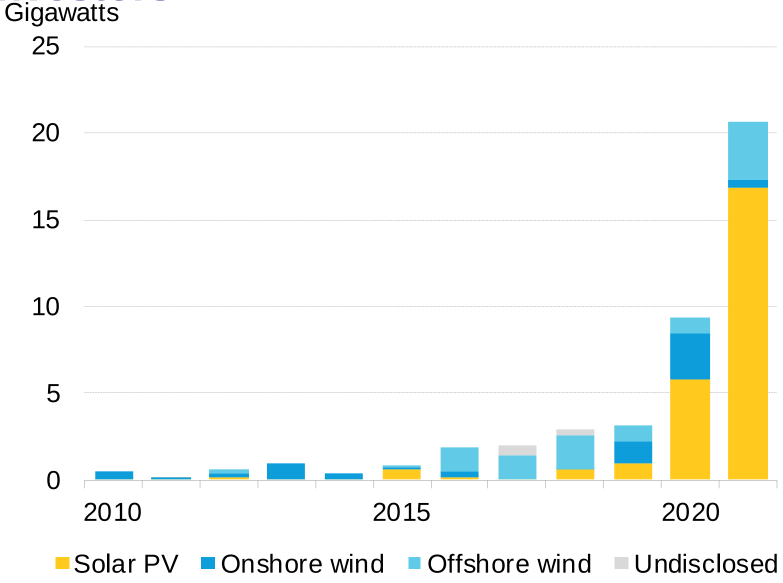
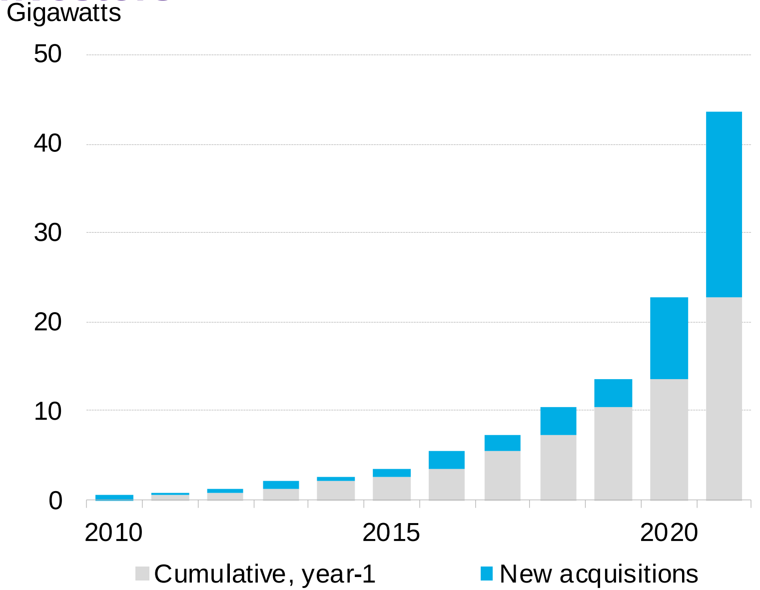
Oil and gas acquisitions rise rapidly as decarbonization targets loom.

Annual acquisitions by oil and gas investors



Source: BloombergNEF. Note: Includes assets associated with corporate M&A. Undisclosed series includes assets where technology split is unknown.

Cumulative acquisitions by oil and gas investors



Source: BloombergNEF. Note: Includes assets associated with corporate M&A.

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

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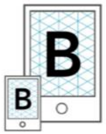

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