European and National Challenges for Renewables: A global View

Ben Backwell
CEO, GWEC
Co-Chair Global Renewables Alliance

GWEC
GLOBAL WIND ENERGY COUNCIL

2024
PORTUGAL RENEWABLE ENERGY SUMMIT
4-5 Nov.
Culturgest
Lisboa

APREN Associação de Energias Renováveis

Benchmarking Europe’s Net Zero plans

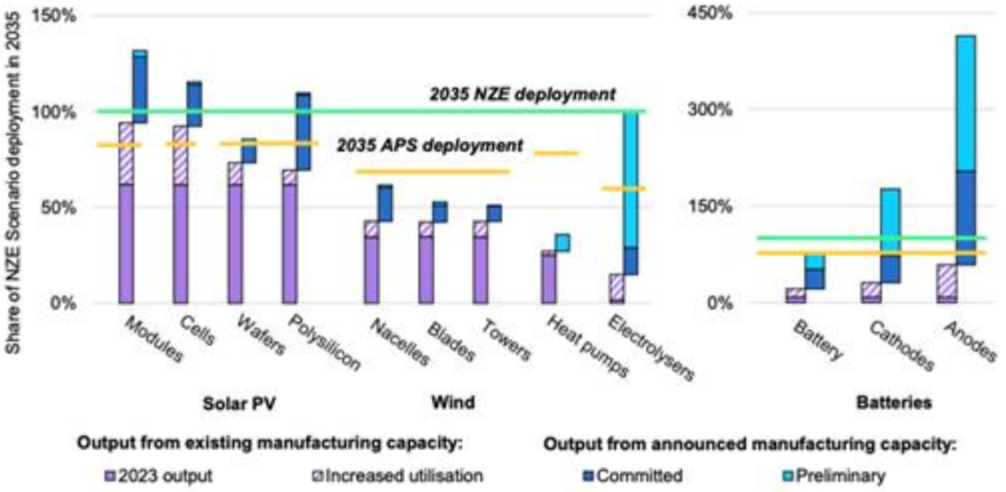
Global Outlook

- **$623 billion** total investment in renewable energy in 2023.
- A total of **578 gigawatts of new renewables** capacity was added in 2023. A continuation of this trend would bring us to **8.2 TW by 2030** (wind making up 2.7 TW), still **29% below net NZ** pathway.

What is needed for NZ

- **$1 trillion** average annual investment required globally between 2024 and 2030 plus **$193 bn** per year in battery storage and **$607 bn in grid**.
- To achieve NZ we need **11TW** of installed capacity by 2030. If current policies are enacted this could rise to 10.3 TW

Figure 2.11 Announced annual manufacturing capacity as share of deployment in 2035 by technology and scenario

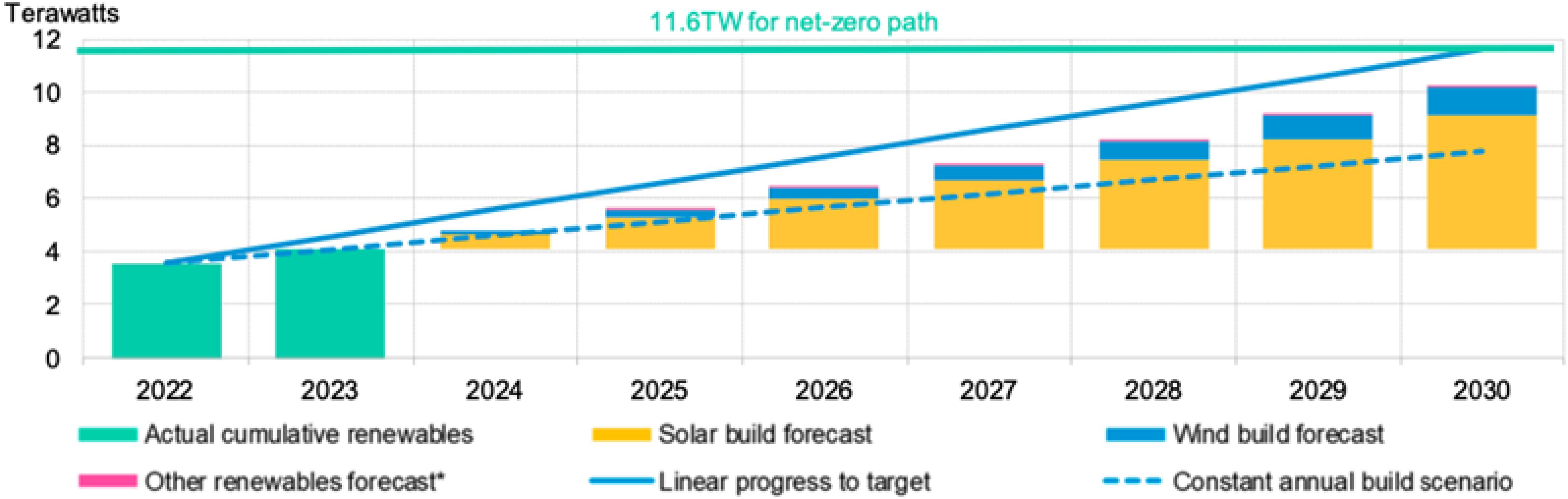


Notes: APS = Announced Pledges Scenario; NZE = Net Zero Emissions by 2050 Scenario. Battery demand here includes that for all electric vehicle types and stationary storage. Announced manufacturing capacity refers to announcements made by H1 2024 that could come online by 2030.

Existing solar PV module and cell manufacturing capacity can meet deployment needs in 2035 in the APS and is close to NZE Scenario needs, though other technologies fall short.

Benchmarking Europe’s Net Zero plans

Pathways to reach tripling-renewables target at constant growth rates and forecasts

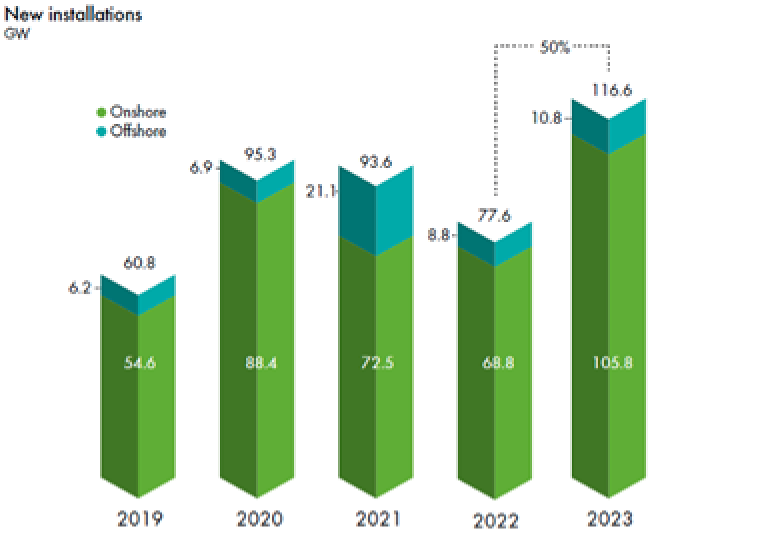


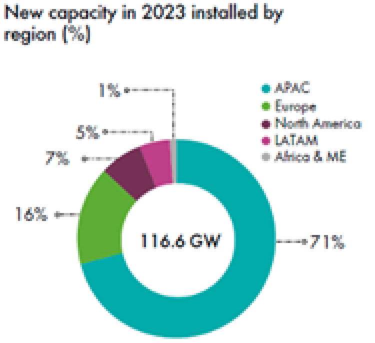
Source: BloombergNEF. Note: ‘Constant annual build’ shows the result of annual additions holding constant at 2022-23 levels. The 11.6TW line shows the 2030 capacity under BNEF’s Net Zero Scenario. BNEF’s forecasts for wind and solar are based on detailed country-level analysis of project pipelines, asset financing, renewable energy demand, economics and enabling policies. The forecast for ‘other renewables’ is based on project pipelines only and is aligned with BNEF’s Economic Transition Scenario.

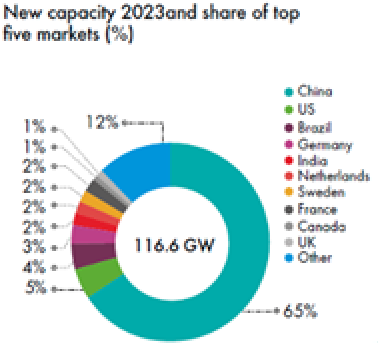
GWEC
GLOBAL WIND ENERGY COUNCIL

Benchmarking Europe's NZ targets:: Wind

- **117 GW** of new wind power capacity was added to the power grid worldwide in 2023, 50% more than in 2022, bringing total installed wind capacity to **1,021GW**
- Europe only added **16% of new capacity** in 2023 (16.2GW) in comparison to 71% in APAC.
- Wind Europe expects 29GW average wind installations 2024-2030 to reach 393GW, compared to the 425GW it estimates are necessary for NZ
- GWEC expects significant uplift in Europe in coming years
- German onshore wind is speeding up and Germany is once again becoming significant wind market in global terms (7.5GW in 2023). This is due to extraordinary action by Germany to transform EU directives on planning into real action on the ground
- European leaders have has declared extremely ambitious target of 120GW for Offshore Wind, although the European association is questioning whether this is now viable







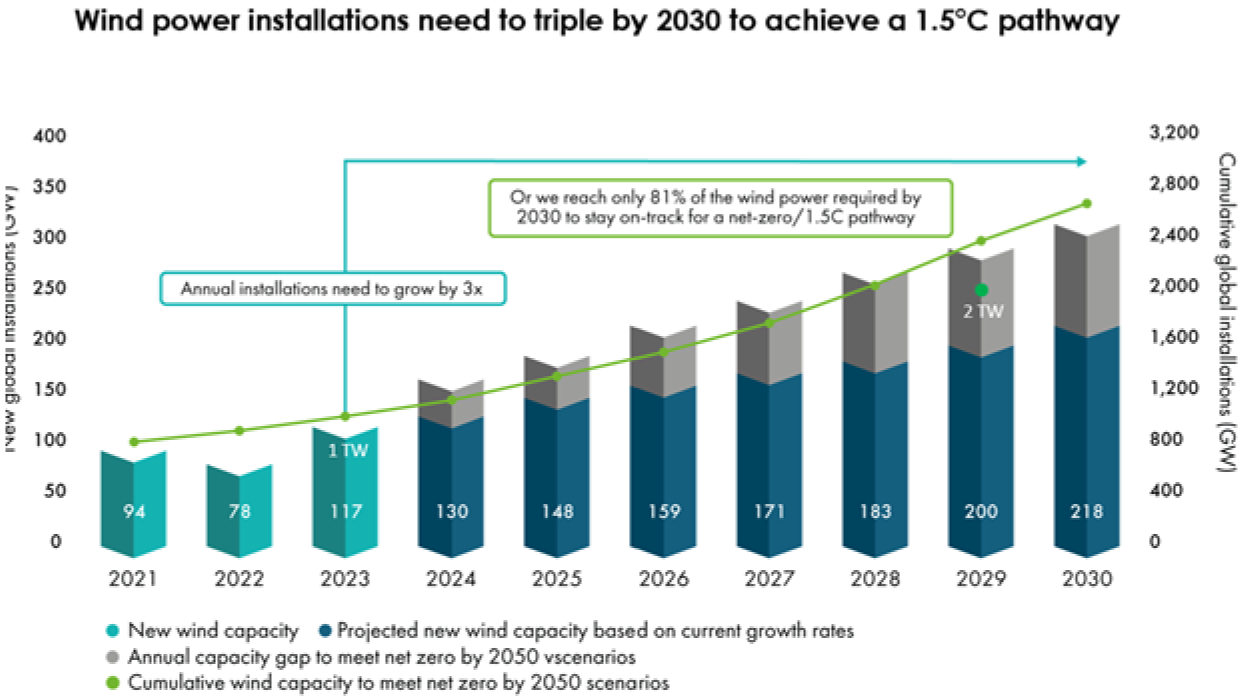
Source: GWEC Market Intelligence, March 2024

A sizeable gap in the wind energy capacity required by 2030 to stay on track for a 1.5°C pathway

- The wind industry reached the **1st TW** milestone by the **end of 2023**.

- GWEC Market Intelligence forecasts that the milestone of a **second TW** is likely to be passed by the **end of 2029**, one year ahead of our previous year's projection.

- Globally, **1.2 TW** of wind power is likely to be added in **2024-2030**, of which **52%** will come from **China**, making it retain the largest wind market in the world, followed by **Europe** (22%), **the US** (10%) and **India** (3%).



Source: GWEC Market Intelligence; IEA Net Zero by 2050 Roadmap (2023).

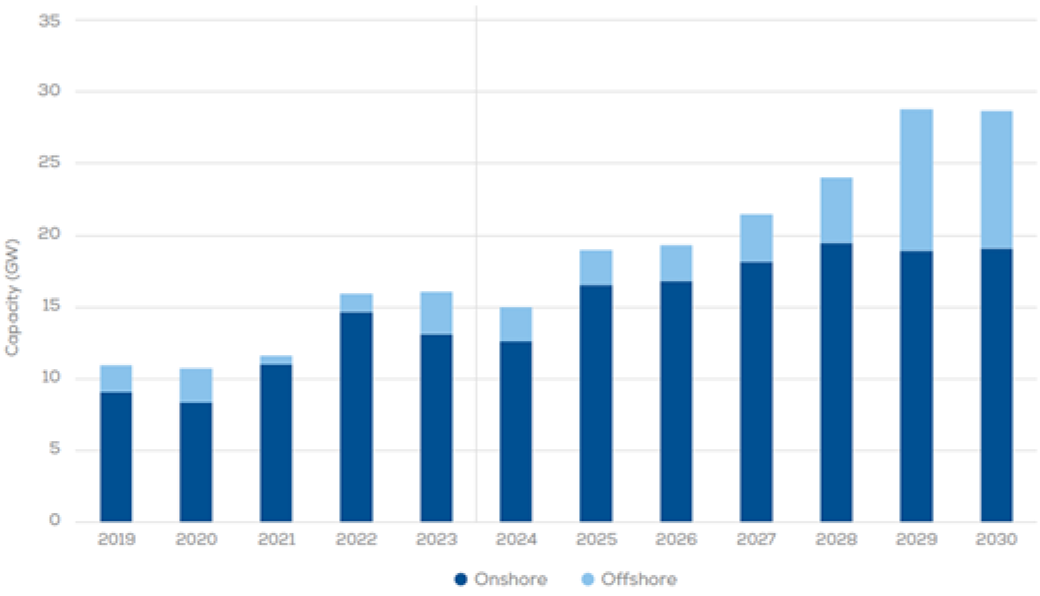
Wind power installations in the EU is expanding less quickly than Governments want and will miss target

- The EU is expected to build **22 GW of new wind farms a year on average over the period 2024-2030**. However, to meet its 2030 climate and energy targets, the EU now needs to build 33 GW a year on average.

- **The EU** is likely to have **350 GW** of wind energy capacity by end of 2030 (296 GW onshore and 54 GW offshore), **75GW lower than the 425GW EU target**.

- Wind Europe says 1H 2024 build out less than expected at only 6.4GW, and says EU not on track to meet targets

New wind power installations in the EU, 2024-2030



ource: WindEurope, September 2024

GWEC
GLOBAL WIND ENERGY COUNCIL

NZIA impacts on Wind power installations in the EU…bullish or bearish?

- Leading wind developers and utilities are questioning the possible impact of NZIA

Main concerns:

- different implementation of Act across multiple countries,
- increased complexity and cost for developers;
- ambiguity on implementation of local content targets in tendering;
- supply chain bottlenecks and delays to green lighting projects due to mismatch between targets and existing supply chain configuration.
- Overall Impact of the above on overall costs and growing divergence between European wind prices and prices elsewhere

Key Challenges for the EU

Key challenges:

- **Grids and Infrastructure**
- **Permitting and Land Use**
- Auctions and Offtakes
- Power Market Design

Example: It can take **4 to 12 years to develop a solar or onshore wind project in Europe**, and over **12 years for offshore wind**.

Table 1: Key challenges for scaling investment in renewables, by market

Region	Market	Increased access (Cut fossil-fuel subsidies, ease generation licensing, encourage market participation)	Auctions and offtakes (Trustworthy offtakes, de-risking projects, diverse technologies)	Grids and infrastructure (Expanding grid capacity, regional interconnectors, managing grid queues)	Permitting and land (Clarifying appeals, data sharing, staffing of municipal offices)	Power market design (Long-term targets, competitive price signals for capacity and dispatch)
Americas	Brazil	Gray	Yellow	Red	Yellow	Red
	US	Gray	Gray	Red	Red	Gray
Europe, Middle East and Africa	Europe	Gray	Yellow	Red	Red	Yellow
	Middle East, North Africa and Turkey	Red	Red	Yellow	Yellow	Gray
	Sub-Saharan Africa	Red	Red	Yellow	Red	Yellow
Asia Pacific	India	Gray	Yellow	Gray	Red	Red
	Indonesia	Red	Red	Gray	Gray	Red
	Japan	Gray	Yellow	Red	Red	Yellow
	China	Gray	Gray	Yellow	Gray	Yellow

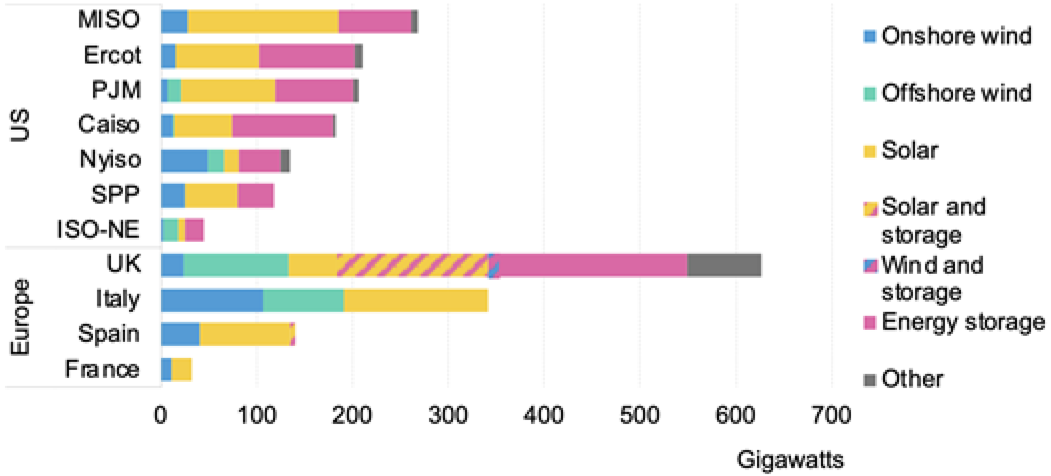
Source: BloombergNEF. Note: Qualitative assessment undertaken by BNEF. Red shading indicates issues of most importance to that region. Yellow indicates the region has some challenges of this sort. Gray indicates these are issues that are not what is currently deterring investment in the region.

GWEC
GLOBAL WIND ENERGY COUNCIL

Key Challenges for the EU

- **Grids:** Estimated nearly **2.2 terawatts** of wind, solar and battery storage capacity is stuck in queues
- **Permitting:** Permitting can take **10 or more years for offshore wind**, **4 to 9 years for onshore wind.**
- Securing consent for building an onshore wind farm in Europe takes longer than the building process itself.
- **Negative pricing** in Europe reached a record high, occurring for **7,841 hours** during the first eight months of 2024(WEF).

Figure 37: Capacity of power projects in grid connection queues in selected markets in the US and Europe

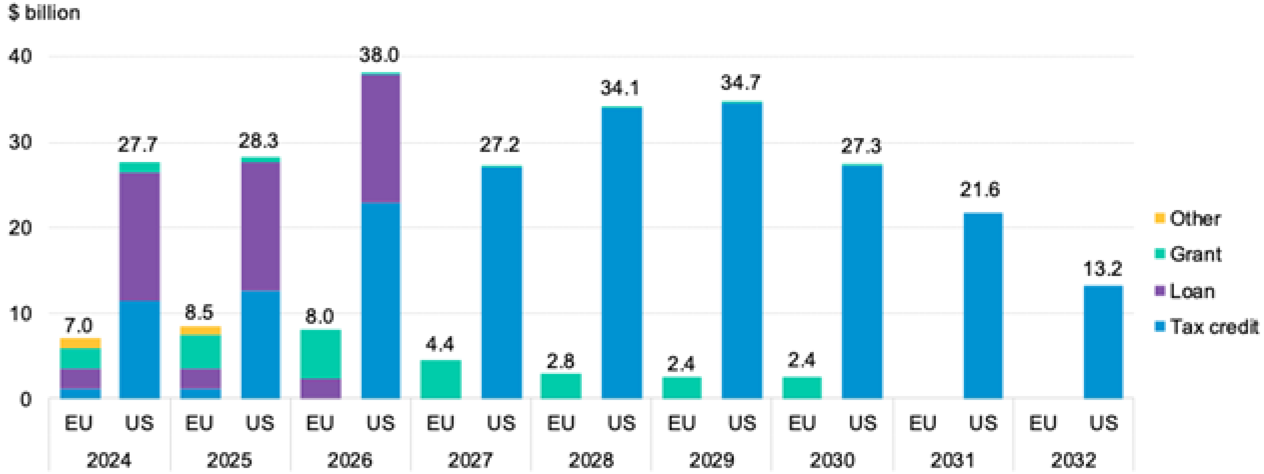


Source: BloombergNEF, California ISO (Caiso), Electric Reliability Council of Texas (Ercot), Pennsylvania-New Jersey-Maryland Interconnection (PJM), New York ISO (Nyiso), Midcontinent ISO (MISO), Southwest Power Pool (SPP), ISO New England (ISO-NE), Lawrence Berkeley National Laboratory (LBNL), RTE (France), REE (Spain), Terna (Italy), National Grid ESO (UK).

Net Zero Industry Act (NZIA)

- The NZIA aims to enhance the EU's manufacturing capacity for net-zero technologies to meet at least **40% of annual deployment needs** by 2030 and establish a **CO2 storage capacity of 50 million tonnes** per year by 2030.
- In comparison to China, India (PLI) and US (IRA), the NZIA does not provide direct financial incentives, instead, it promotes access to existing EU funding programs.

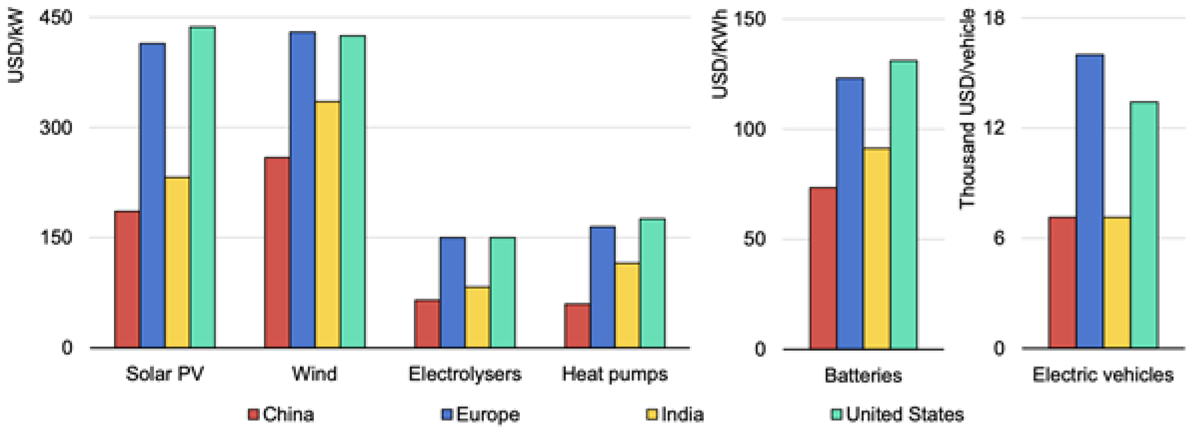
Estimated annual EU and US solar, battery and EV manufacturing subsidy spend by funding type



Source: BloombergNEF. Note: "Other" refers to policies where available funding might be disbursed as loans or grants. For schemes that are less specific on spending, the share of future funding going to clean-tech subsidies is based on that earmarked for clean technology manufacturing in the past. Expiry in 2030 is assumed when phase-out dates are unknown

Capital Costs Highest in the EU

Figure 1.22 Indicative capital costs for selected clean energy technologies by country/region, 2023



Notes: Capital costs are shown per unit of annual rated capacity. Solar PV includes polysilicon, wafer, cell and module production facilities; batteries include cell, anode and cathode production facilities; wind includes nacelle, tower and blade facilities. Electrolysers and heat pumps include only the final assembly step. Costs refer to greenfield, non-integrated facilities where these attributes could be isolated in the data and constitute averages across plants of different sizes today. Data gaps were filled using regional multipliers based on differentials in cost for constructing other facilities where more data are available. No explicit policy incentives (e.g. investment tax credits) are applied in this assessment. See the Annex for more details on the scope and methodologies used in this analysis. USD = USD (2023, MER).

Source: IEA analysis based on Wood Mackenzie (2024); BNEF (2024a); IEA (2024a); and Atlas EV hub (2024).

Capital costs for manufacturing facilities vary significantly across technologies and countries, and are generally lowest in China.

EU in Comparison

- Europe is slightly behind its renewables tripling goals along with US and India, whereas China and Brazil are on track.
- **Europe needs only a 2.4-fold increase** in renewable capacity to meet 2030 net-zero goals but is projected to **fall about 15% short.**
- BNEF's wind forecast is around **100 GW below** the volume envisaged in the Net Zero Scenario.

Table 2: Regional assessment of global renewables tripling goal

On track for 2030 contribution?	Region	Renewables capacity in 2023 (gigawatts)	BNEF Take
On track Forecasts for these regions are in line with net zero and a global tripling of renewables.	China	1,558	China is expected to more than triple its renewables capacity by 2030 and be on course for net zero. The country must continue to build out its grid and energy storage to allow a greater deployment of wind.
	Brazil	203	Brazil is not set to triple its renewables by 2030. However, given that 85% of its generation mix is already low-carbon thanks to a large hydro base, a better goal here might be to focus on reducing carbon emissions outside the power sector, such as in industry, transport and agriculture.
Slightly behind These regions are making progress and have policy support, but they are insufficient to meet a global tripling of renewables or net-zero pathways.	Europe	750	Europe can do less than triple its renewable capacity by 2030 and still align with net zero. A by 2.4 times increase would be adequate. However, it is set to miss this, and in particular is not expected to build enough wind. Individual countries are attempting to address the permitting and grid bottlenecks holding back deployment. In some markets with high renewables penetration, electrification needs to speed up to support revenues for project developers, and time-of-day power tariffs implemented.
	US	430	The US is behind on renewables capacity deployment relative to its net-zero goals and tripling capacity, and will struggle to meet a net-zero path unless it can improve bottlenecks around permitting and grids.
	India	195	India needs to quadruple renewables capacity by 2030 to align with BNEF's Net Zero Scenario. The country is actively building, but we expect it to miss the target by 27%.
Not on track These regions are not on track and are making little progress.	Japan	127	Japan does not need to triple its renewable capacity by 2030 to align with net zero, but even so is set to miss the net-zero pathway by 40%.
	Sub-Saharan Africa	59	BNEF sees sub-Saharan Africa's renewables base increasing by 2.5 times by 2030, largely driven by solar. However, this is from a small base. More will need to be done to align with net zero, especially given governments' plans to add more fossil-fuel power to meet rising electricity demand and make use of domestic resources.
	Middle East, North Africa and Turkey (MENAT)	113	BNEF sees the MENAT region nearly tripling its renewables base by 2030, mostly with solar. However, the existing base is small and this will be insufficient to align with net zero.
	Indonesia	14	Indonesia is not on track for BNEF's Net Zero Scenario, which sees the renewable energy fleet growing more than sixfold by 2030, compared to an expected doubling in our forecasts.

Source: BloombergNEF. Note: The Net Zero Scenario referenced is from BNEF's 2024 New Energy Outlook (behind a paywall: web | terminal).