Renewable energy growth ngerulmud

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The U.S. clean energy sector received massive legislative wins in recent years, particularly with the Inflation Reduction Act, Bipartisan Infrastructure Law and CHIPs Act. But are these laws and the investments that come with them resulting in enough carbon-free power?

While we"ve seen a good deal of momentum over the last year -- such as record-breaking EV sales, new energy capacity dominated by renewables, and promising policy movements on key issues such as transmission -- significant obstacles remain. Rising interest rates and project costs, permitting and siting challenges, and persistent supply chain issues are holding clean power development back at a time when it needs to be surging ahead.

In many ways, 2023 was a record-breaking year for clean energy deployment in the United States, including the escalating installation rate of solar and energy storage, growing EV sales and the number of planned domestic manufacturing facilities.

A record 31 gigawatts (GW) of solar energy capacity was installed in the U.S. in 2023, a roughly 55% increase from 2022 installations and substantially more than the previous record in 2021. Even with significant project delays due to supply chain issues and other factors, solar was the fastest-growing power source in the U.S, representing half of all new utility-scale generating capacity through Q3 of 2023. Installed solar capacity in the U.S. now totals 161 GW, enough to provide about 5% of the nation"s electricity, according to the Solar Energy Industries Association.

Battery storage also grew substantially in 2023, with installations through Q3 exceeding those of all of 2022. Strong growth is expected to continue, with a projected doubling of capacity in 2024.

Wind had more modest growth in 2023 (about 8 GW), lagging behind 2022 installations. Total installed capacity reached 147 GW by Q3 of 2023, representing about 11% of electricity generation. Projections call for an uptick of new wind projects this year, totaling about 17 GW in 2024.

Together, renewables combined with energy storage dominated new utility-scale generation sources, representing more than three-quarters of total new capacity added (see graphic below). Renewables, including large hydropower, represented about 25% of electricity generated in the United States in the first half of 2023.

Yet despite record growth, renewable energy installations need to ramp up even faster. Analyses of achieving 100% carbon-free electricity by 2035, what"s needed to achieve U.S. greenhouse gas reduction targets, indicate that annual installation rates of renewables in coming years need to nearly double the rates seen in 2023.

Despite news reports highlighting the slowing of electric vehicle (EV) sales, a record 1.2 million EVs were sold in the U.S. in 2023, representing 7.6% of total vehicle sales, up from 5.9% in 2022. Sales continued to be strong through year end, with the fourth quarter setting records for both the number and share of EVs sold (317,000 EVs and 8.1% of total sales, respectively) - with EV sales up 40% from Q4 of 2022. Reports of the "slowdown" reflect a slowing in the rate of increase; sales remain robust and at record-setting levels.

Progress, albeit slower than hoped, is also being made on EV charging infrastructure, supported by $7.5 billion in funds under the Bipartisan Infrastructure Law. The National Electric Vehicle Infrastructure (NEVI) program, created under the Bipartisan Infrastructure Law and designed to support new EV charging corridors and fast-charging stations, had its first charging stations installed in Ohio in late 2023, with additional stations set to open in New York, Pennsylvania, Vermont and Maine in the coming months.

Ten transmission lines, which have been in process for years, have begun construction since 2021. If completed, they are expected to collectively support the addition of 20GW of new power generation to the grid, but they still face hurdles.

Another 26 high-capacity transmission projects are underway across the U.S., although their ability to be completed is uncertain and pending policy reforms. In late 2023, the Midcontinent Independent System Operator (MISO), the transmission planning organization covering the area from Louisiana to Manitoba, selected the first competitively bid project to move forward as part of an initial $10.3 billion investment approved under MISO"s Long Range Transmission Planning process.