RENEWABLES: CURRENT STATE AND PROSPECTS

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According to the International Renewable Energy Agency, by the end of 2023 the total installed capacity of renewable energy reached around 3,372 GW. Just in 2023, about 473 GW were added, which is a record growth of 14%. Most of this came from solar and wind energy, which now make up over 90% of new capacity. Solar power especially became popular, because it's easy to install – from big solar farms to small panels on roofs. In 2024, the total global solar capacity passed 1,600 GW, and the cost of solar electricity dropped to about $0.049 per kWh, which makes it even cheaper than coal or gas in many countries.

Wind power is also growing fast. In 2023, about 85 GW of onshore wind and

12 GW of offshore wind were added. Offshore wind is now expanding in Europe, China, and even the U.S., with huge projects like the Dogger Bank in the UK. Hydropower is still the biggest renewable source overall, with around 1,300 GW, but it grows slowly now because of environmental limits and lack of good locations. Bioenergy and geothermal energy are smaller, but still useful for stable energy supply.

One big issue with renewables is that they depend on weather, but this is being solved by battery storage. Global battery capacity went over 50 GWh in 2024, and the cost of batteries keeps falling, which helps balance electricity when there's no sun or wind.

The future looks pretty optimistic. The International Energy Agency expects that renewables will give about 35% of the world's electricity by 2025, and maybe up to 65% by 2030 if progress continues fast. Solar and wind will dominate, and there are new technologies like floating offshore wind, perovskite solar cells, and green hydrogen that might become very important soon. Green hydrogen is especially promising for heavy industries like steel or transport, where electricity alone isn't enough.

Policies also play a big role. For example, the EU's plan to boost renewable energy wants 45% renewables by 2030. China is targeting 1,200 GW of wind and solar, and the United States has a big law called the Inflation Reduction Act that supports clean energy projects. In poorer regions like Africa and Latin America, renewables are helping people get electricity through small off-grid solar systems.

In Ukraine, renewable energy has a special meaning because of the war and the need for energy independence. By 2024, Ukraine had about 9.5 GW of renewables – mostly solar and wind. Even though some infrastructure was damaged, new small solar systems are being installed everywhere, and Ukraine is now connected to the EU power grid. By 2030, the country hopes to reach 20 GW of renewables.

In conclusion, renewable energy is growing really fast and becoming a big part of our future. It's not perfect yet, but with innovation, investments, and cooperation

between countries, it could become the main source of power in the world.

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