

Is wind or solar cheaper

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Wind and solar are the world's fastest growing energy sources and together generated 12% of global electricity in 2023. The amount of energy produced by wind and solar is expected to increase and accelerate.

Despite the rapid growth of renewable energy, the most carbon-intensive forms of electricity generation, using coal and natural gas, have risen by 22% and 37% since 2010, respectively. Coal and gas power generation is still the backbone of global energy systems and these fuels are likely to remain dominant for decades to come. Nonetheless, the phase-out of coal (arguably the dirtiest of fossil fuels) is gaining momentum.

In the most prosperous OECD countries (or Organisation for Economic Co-operation and Development), virtually no new coal plants are planned or being built, though new coal mines are still being approved. This is a result of national policies such as the UK's decision to ban coal in power generation from October 2024.

This picture is very different in Asia. Here, countries have relied heavily on cheap coal to fuel their economies. This is particularly true in China. After adding 27 gigawatts (GW) from coal in 2022 alone, China by itself is offsetting the retirement of coal plants elsewhere in the world.

But there are some signs this is changing. The global pipeline for new coal power plants is smaller than ever and China and India both pledged to "phase down coal" in 2021 at the Glasgow climate summit.

So, rapidly increasing renewable energy hasn't cut coal and gas consumption at the same rate because humankind is using a lot more electricity than we used to, especially in Asia. In the last 20 years, the use of electricity in Europe and North America has remained largely constant.

Here, renewable energy has slowly eaten into the proportion of energy generated by fossil fuels, while all other energy sources (nuclear, hydro, biomass) have remained about the same. In Asia, electricity demand has tripled since the 2000s, with the bulk of this energy coming from fossil fuels.

Western economies have made progress in replacing fossil fuels (and coal in particular) with renewables during the last decade. In Europe and North America, wind has become a vital energy source during the winter months when energy demand peaks. And when the wind isn't blowing, gas generation fills the gaps.

Solar energy, when combined with batteries which can store excess electricity, is also proving to be a cheaper option than both gas and coal in certain parts of the world. In Australia, the industry association Australian



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Clean Energy Council found that solar panels and batteries are 30% cheaper than gas power plants during peak demand periods.

A Bloomberg NEF investigation found that batteries alone are already cheaper than gas power plants during these times. In fact, solar panels may be generating electricity more cheaply than the grid in some cases.

In India, the cost of generating electricity from solar and storing it in batteries to use during high demand hours has lower costs than existing coal plants. Combined solar and battery plants can activate during peak hours and turn off again when demand drops, regardless of whether the wind is blowing or the sun shining.

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Web: <https://sumthingtasty.co.za/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

