

Wind and solar power could significantly exceed Britain's energy needs

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Britain's energy needs could be met entirely by wind and solar, according to a [policy brief](#) published today by Oxford's Smith School of Enterprise and the Environment.

Wind and solar can provide significantly more energy than the highest energy demand forecasts for 2050 and nearly 10 times current electricity demand (299 TWh/year). The research shows up to 2,896 TWh a year could be generated by wind and solar, against the demand forecast of 1,500 TWh/year.

These estimates are intentionally conservative, accounting for common concerns around [land use](#) and the visibility of installations, say the authors.

"This is a question of ambition rather than technical feasibility," says lead author Dr. Brian O'Callaghan. "The U.K. is already lagging in the global green race. Instead of hitting reverse, we should be turbocharging on [renewables](#) with U.S.-style incentives and gearing up our grid for the surge that is already underway."

Cameron Hepburn, Battcock Professor of Environmental Economics at the Smith School of Enterprise and the Environment, says, "Initiatives to speed up renewable projects were the silver lining in an unfortunately poor set of policy announcements from the government this week. Our brief shows [renewable energy](#) can play a leading role in our transition to net zero. While it's likely that [nuclear power](#) and other renewables will also have a part to play, our analysis finds that it's entirely possible to power Great Britain on wind and solar alone."

Professor Hepburn adds, "But we can't rely on this to reduce emissions—moving to EVs, for example, was expected to deliver significant carbon savings of [23MtCO₂e per year](#) on average between 2033 and 2038. We need to use every tool at our disposal to reach net zero."

The analysis anticipates [offshore wind](#) produces the bulk of the energy, 73% (2,121 TWh/year). Onshore [wind](#) contributes around 7% (206

TWh/year), while taking up only 0.07% of the country's land. By comparison, 0.9% of English land is used for mining and quarrying.

Utility-scale solar contributes around 19% (544 TWh/year), and the rest is made up by rooftop solar, covering 8% of GB's roof area (25 TWh/year).

The authors note that the grid will need significant upgrades to handle this amount of renewable energy, including the scaling of energy storage. But, with an eye to quickly falling costs, they believe these challenges can be [overcome](#) with [investment and policy support](#).

Last week, Prime Minister Rishi Sunak pledged to end bureaucratic delays holding back renewable energy and storage projects.

Provided by University of Oxford

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