

# New research blows away claims that aging wind farms are a bad investment

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A wind farm in South Australia

Wind turbines can remain productive for up to 25 years, making wind farms an attractive long-term choice for energy investors, according to new research.

The UK has a target of generating 15 per cent of the nation's energy from renewable resources such as [wind farms](#) by 2020. There are currently 4,246 individual [wind turbines](#) in the UK across 531 wind farms, generating 7.5 per cent of the nation's electricity.

There has been some debate about whether wind turbines have a more limited shelf-life than other energy technologies. A previous study used a statistical model to estimate that electricity output from wind turbines

declines by a third after only ten years of operation. Some opponents of wind power have argued that ageing turbine technology could need replacing en masse after as little as ten years, which would make it an unattractive option in economic terms.

In a new study, researchers from Imperial College Business School carried out a comprehensive nationwide analysis of the UK fleet of wind turbines, using local wind speed data from NASA. They showed that the turbines will last their full life of about 25 years before they need to be upgraded.

The team found that the UK's earliest turbines, built in the 1990s, are still producing three-quarters of their original output after 19 years of operation, nearly twice the amount previously claimed, and will operate effectively up to 25 years. This is comparable to the performance of gas turbines used in power stations.

The study also found that more recent turbines are performing even better than the earliest models, suggesting they could have a longer lifespan. The team says this makes a strong business case for further investment in the wind farm industry.

Dr Iain Staffell, co-author of the paper and a research fellow at Imperial College Business School, said: "Wind farms are an important source of renewable energy. In contrast, our dwindling supply of fossil fuels leaves the UK vulnerable to price fluctuations and with a costly import bill. However, in the past it has been difficult for investors to work out whether wind farms are an attractive investment.

"Our study provides some certainty, helping investors to see that wind farms are an effective long-term investment and a viable way to help the UK tackle future energy challenges."

Professor Richard Green, co-author and Head of the Department of Management at Imperial College Business School, added: "There have been concerns about the costs of maintaining ageing wind farms and whether they are worth investing in. This study gives a 'thumbs up' to the technology and shows that renewable energy is an asset for the long term."

The researchers reached their conclusion using data from NASA, collected over a twenty year period, to measure the wind speed at the exact site of each onshore wind farm in the UK. They compared this with actual recorded output data from each farm and developed a formula that enabled them to calculate how wear and tear of the machinery affects the performance of the turbines. This is in contrast to the previous study, which only used the average estimates of nationwide wind speeds to determine the effects of wear and tear on wind farm infrastructure.

In the future, the team aim to study newer wind farms over a longer period to determine if advancements in turbine technology means that they are degrading less. This could help the researchers to determine more accurately how long newer wind farms will last so that they can calculate their potential long-term economic benefits.

Provided by Imperial College London

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