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# Press Release

## Renewable energy sources are more profitable than ever

**Investments in wind and solar power sources have long been considered as expensive and dependent on public subsidies. A new study by economists from the University of Mannheim shows that plants in good locations can now be operated profitably without subsidies. The reason for this: cost reductions through technological innovations have been able to overcompensate countervailing dynamics in the revenues of renewables.**

Driven by government subsidies, the share of renewable energy in the electricity mix has been rising for years. The German Federal Environment Agency, for instance, recorded a share of 49 percent for the first half of 2022, an increase of around eight percentage points from the previous year.

However, subsidies for new wind and solar power plants have fallen drastically in recent years. At the same time, renewables are increasingly subject to a “cannibalization” effect in places where significant additions of wind or solar power capacity cause market prices to fall during hours when renewable sources are near peak capacity. Accordingly, industry analysts have warned about the possibility of wind and solar energy not becoming competitive with conventional power generation technologies for a long time.

A new study by the economists Prof. Dr. Gunther Glenk and Prof. Stefan Reichelstein, Ph.D. from the University of Mannheim now clears the doubt. Over the past decade, the costs of new wind and solar photovoltaic installations have declined much faster than the corresponding revenues. This dynamic has led to an increase in the profitability of renewables and has even made wind and solar plants in good locations the most profitable technologies for generating electricity.

The cost reductions are based on so-called learning effects that measure the rate of technological progress for wind and solar energy sources. "Each installed system provides learning experiences that lead to cost reductions, which, in turn, lead to further capacity deployment. Such cycles are crucial for the speed of the energy transition," Prof. Glenk outlines.

As part of the study, the economists first introduced a profitability metric that captures the relevant unit economics of both renewable and conventional power sources on a life-cycle basis. This metric was then calibrated based on data for wind, solar photovoltaic, and natural gas power plants built in California and Texas between 2012-2019. The two states in the U.S. serve as prime examples in the study, since California has primarily expanded solar power plants over past decade, while Texas has focused on wind energy.

A contributing factor for the favorable results for renewables is that the competitiveness of natural gas-fired power plants increased less or remained stable over the 2012-2019 period. For instance, gas power plants in California have experienced higher average cost on account of their lower capacity utilization rates. Yet, this effect was counterbalanced by the plants earning a price premium for the electricity they produced at times of weak renewable power generation. "Conventional power plants produce less energy but can sell it at higher prices than before," Prof. Reichelstein explains the phenomenon.

High prices for fossil fuels, as currently observed, reinforce the findings of the study. "A rapid expansion of wind and solar power sources now offers the opportunity to both reduce greenhouse gas emissions and provide sustainable and economically viable remedies to the current energy crisis," Prof. Glenk concludes.

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