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Photovoltaic and Wind Cost Decrease Estimation: Implications for Investment Analysis

by

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Abstract.

This research intends to contribute to the analysis of planned and forecast future paths of renewable energy capacity deployments - mainly wind and solar photovoltaic. The paths forecast by the International Energy Agency as published in its roadmaps are considered. The learning rate of both energies, or 'learning by doing', that implies cost decreases as a result of capacity deployment is explicitly considered, as well as its variability. New values for both wind and photovoltaic learning rates are estimated and presented, that allow a significant simulation analysis. The implied uncertainty by that variability induces risks for the financial planning of investments, and a framework to assess and manage that risk is presented and implemented in the simulations conducted. It is shown that this parameter-variability is significant and yields less favorable results as compared to standard static-fixed parameter simulations. Alternative investment paths are considered, the results showing that a faster path does not necessarily result in a significant increase in the accumulated final investment. Thus, accelerated deployment paths are advised to fight climate change.

Keywords: wind energy learning rate; photovoltaic learning rate; Monte Carlos simulation; investment risk analysis.

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