

Accepted Manuscript

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PII: S0014-2921(18)30110-7
DOI: [10.1016/j.euroecorev.2018.07.004](https://doi.org/10.1016/j.euroecorev.2018.07.004)
Reference: EER 3167

To appear in: *European Economic Review*

Received date: 17 February 2018
Accepted date: 2 July 2018

Please cite this article as: Alexander Zerrahn, Wolf-Peter Schill, Claudia Kemfert, On the economics of electrical storage for variable renewable energy sources, *European Economic Review* (2018), doi: [10.1016/j.euroecorev.2018.07.004](https://doi.org/10.1016/j.euroecorev.2018.07.004)

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On the economics of electrical storage for variable renewable energy sources

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Abstract

The use of renewable energy sources is a major strategy to mitigate climate change. Yet Sinn (2017) argues that excessive electrical storage requirements limit the further expansion of variable wind and solar energy. We question, and alter, strong implicit assumptions of Sinn's approach and find that storage needs are considerably lower, up to two orders of magnitude. First, we move away from corner solutions by allowing for combinations of storage and renewable curtailment. Second, we specify a parsimonious optimization model that explicitly considers an economic efficiency perspective. We conclude that electrical storage is unlikely to limit the transition to renewable energy.

Keywords: variable renewable energy sources, wind, solar, energy storage

JEL codes: O33, Q21, Q41, Q42

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