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## Spatiotemporal wind energy potential estimation and analysis in Japan

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For an efficient integration of wind and solar resources toward sustainable energy systems, it is crucial to consider their fluctuations in space and time. Current spatial wind potential estimations in Japan are limited to the annual average of wind speed. In this study, we evaluate the spatial and temporal evolution of both onshore and offshore wind energy potential in Japan based on 5 km mesh and 1-hour sampling weather forecast data. We then demonstrate the benefits of cross-border sharing on the power output stability and identify important sites having high average potential and low average correlation with other sites for the temporal smoothing of power output.