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Atmospheric Circulation Drivers Of Nationally-Aggregated Wind Energy Production Over Greece

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Abstract : Climate change adaptation requires the exploitation of renewable energy sources such as wind. However, climate variability can affect the regional wind energy potential and consequently the available wind power production. The goal of the research project is to examine the impact of atmospheric circulation on wind energy production over Greece. In the context of synoptic climatology, the proposed novel methodology employs Self-Organizing Maps for grouping and classifying the atmospheric circulation and nationally-aggregated capacity factor time series for a 30-year period. The results indicate the critical effect of atmospheric circulation on the national aggregated wind energy production values and therefore address the issue of optimum distribution of wind farms for a specific region.

Keywords : wind energy, atmospheric circulation, capacity factor, self-organizing maps
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