

Land cover patterns of wind generation infrastructure in Brazil

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Latest studies estimate land use intensity of wind-powered electricity around 0.3–1.3 m² MWh⁻¹ [1]. This is significantly lower compared to biomass-powered electricity, which land use intensity is estimated around 450–800 m² MWh⁻¹ [1]. Hence, the significant contribution of biomass energy to land-use change, particularly in countries like Brazil, is widely known. In contrary, low land use intensity of wind-powered electricity suggests that contribution of its infrastructure to land-use change is minor. However, some studies point out the potential restriction of land use for human settlements, negative impact on biodiversity [1] and occurring land conflicts [2] due to wind-powered electricity infrastructure. Better knowledge of wind-powered electricity infrastructure impact on land use change require investigation of related land cover patterns. For discovering those patterns, we focus on two major questions:

- What land cover is favourable for VRES infrastructure deployment?
- What land-use changes follow the VRES infrastructure deployment?

Our case study focuses on wind parks deployed during past 25 years in Brazil. For spatiotemporal analysis of land cover patterns in Brazil, we combine annual land-use and land cover time series – available from 1985 to 2017 – with locations of wind generation infrastructure, transmission grids and transportation network [3].

Land cover patterns related to wind parks deployment will improve our understanding of its role in current land use change, and allow the assessment of future land use change in case of extensive wind parks deployment.

[1] Uwe R. Fritzsche et al. „Energy and Land Use“. Global Land Outlook Working Paper (2017).

[2] C. Brannstrom, A. Gorayeb, J. S. Mendes, C. Loureiro, A. J. A. Meireles, E. V. Silva, A. L. R. Freitas, R.F. Oliveira. Is Brazilian wind power development sustainable? Insights from a review of conflicts in Ceará state. Renewable and Sustainable Energy Reviews (2017), 67, p. 62–71. <https://doi.org/10.1016/j.rser.2016.08.047>

[3] MapBiomass Project - Collection v.3.0 of the Annual Land Use Land Cover Maps of Brazil: <http://mapbiomas.org/map#coverage>