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Energy landscapes resulting from climate protection goals – a GIS-based approach to carbon neutrality

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To date, the spatio-temporal patterns of renewable energies brought about by a deployment that corresponds to internationally agreed climate protection goals, have been neither exactly analysed nor visualised. It is also unknown what land uses would be incorporated into these new energy landscapes due to a lack of spatial restrictions, and what social conflicts these land use changes may give rise to. Moreover, the extent to which existing land use, which is the product of a capitalist order, affects the achievement of a carbon-neutral society, has not been grasped at all. There is no knowledge about the feasibility of altering spatial restrictions for renewable energies in order to identify alternative spatial patterns of sustainable energy transition. Our objective is therefore to model and visualise a regional energy landscape whose greenhouse gas balance in the electricity sector corresponds to the target of the UN Climate Conference. The study provides a detailed analysis of the landscape transformations in rural spaces that would be caused if those forces which strive to link the energy transition to the values of the Paris Agreement were to win through. It is revealed that a precise alignment of the expansion of renewable energies with international climate protection targets would strongly mechanise rural areas and significantly transform their land use patterns.