

Popular summary:

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The potential of rural onshore solar and wind energy development in Hong Kong.

The Hong Kong government recognizes the need to increase its use of renewable energy sources, as stated in its climate action and development plans. However, the challenging terrain and limited available land make it difficult to implement renewable energy projects. Geographic Information Technologies (GIS) can help analyse the region effectively, and using GIS can be a solution to address these challenges. By conducting a site suitability analysis using GIS technology, suitable locations for renewable energy projects can be identified. Despite the common use of such a method in global wind and solar studies, it was found not to be widely applied in Hong Kong. This paper aims to rectify this by creating and presenting a site suitability analysis for the potential of rural solar and onshore wind energy sites in Hong Kong.

The study's core element is a suitability model, which enables quick and effective analysis of possible locations for rural solar and wind development across Hong Kong. This tool allows users to consider different factors affecting site suitability and calculate a 'suitability score' to rank the sites. In this study the model was used with parameters based on standard values from established wind and solar energy installations. Using the result from the model, the study also examined how various criteria limit site suitability and impact solar and wind energy progress in Hong Kong.

The findings of this study indicate that there's potential to expand onshore wind turbines and rural solar farms in Hong Kong. Notably, it is estimated that around 117 additional wind turbines could be accommodated, but when you consider factors such as cost and logistical challenges, prioritizing offshore wind energy seems more effective. On the other hand, suitable sites for rural solar farms were found to be abundant and the potential energy generation can exceed Hong Kong's solar energy goals. However, solar farms require a lot of space to be impactful and Hong Kong's strong land management policies suggest that more spatially efficient solar energy strategies (such as solar panels on building roofs) might be preferable.

In conclusion, this study found that the potential of rural solar farms and onshore wind turbines lies in their ability to enhance Hong Kong's energy mix by working alongside current and upcoming alternative energy sources. This approach can lead to a more varied and complete energy portfolio for the region.

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