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PLANNING AND IMPLEMENTATION OF RENEWABLE ENERGY IN COASTAL CITIES - A CASE STUDY OF HUANGPU DISTRICT, GUANGZHOU

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Abstract

To help local governments to scientifically formulate renewable energy (RE) development goals and implement them effectively, the study in this paper developed the renewable energy planning and implementation methodology and applied this method in Huangpu district of Guangzhou for demonstration and application in practical settings. To evaluate the potential of Huangpu from the perspective of renewable energy, quantitative analysis has been carried out by using the GIS method, followed by a multi-criteria assessment and the Delphi Method to screen out applicable technologies in this region. The solar photovoltaic (PV) technology installed on the industrial building rooftop is identified as the suitable solar PV technology development in the target region. The potential of solar resource is also higher than the government's PV development target of 177MW. In addition, the cost-benefit investment analysis based on three typical sizes of solar PV projects has also been carried out using the financial analysis method along with social and environmental benefits. It has been estimated that by 2025, a total of 1001 GWh energy can be generated while carbon emissions can be reduced by 851000 tons of CO₂ equivalent (tCO_{2e}) in the case of the implementation of all 320MW PV projects. The program will contribute to the addition of 163 PV systems in the local PV development market.

Key words: GIS method, Photovoltaic system, renewable energy, spatial analysis, quantitative analysis

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