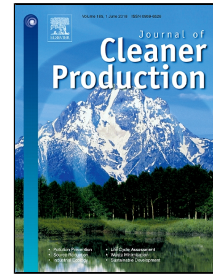


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Abstract— The electrification of current networks is developing to modernize and have a complete smart structure. Rural network electrification as a special part of the power grid will play a vital role in the future smart grid. However, energy management and balancing the supply and demand in rural area have created challenges for the distribution companies. In response to the mentioned challenges, the transactive energy (TE) as a new market based technology is applied to integrate the nine villages and manage the energy exchanging among them optimally. In order to evaluate the effects of TE technology on the rural network integration, three models are considered for analysis of the energy cost of each village and energy not supplied (ENS) in the presence of the renewable energy resources. First model assumed that none of the villages is equipped with renewable energy resources and all their electricity demand is fully provided by the power grid. While the renewable and non-renewable energy resources are considered for two other models. In the second model (individual mode), the villages cannot exchange energy with each other (local transaction market) and they can only connect to the power grid, but in the third model (integrated mode) the villages have an interconnected situation and may exchange energy with each other and grid under the TE management. Simulation results for the nine villages located in India are presented and

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