

Development of Rural Electrification Master Plan in Zambia Targeting 2030

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Abstract

Low household electrification rate (20.4%), especially big gap between rural and urban area (3.1% and 47.8%), is a social problem in Zambia. To mitigate this gap and improve national electrification rate efficiently, preparation of systematic electrification projects' implementation plan is urgent issue.

Government of the Republic of Zambia (GRZ) requested to Government of Japan to technical assistance to develop Rural Electrification Master Plan (REMP). Japan International Cooperation Agency (JICA), an official agency responsible for the implementation of the technical cooperation program on behalf of the Government of Japan, approved execution of the study. Tokyo Electric Power Co., Inc. (TEPCO), as a selected consultant by JICA, has been executing this Master Plan Study since May 2006.

In the development process of the REMP, advanced statistical methods are adopted to forecast potential electricity demand in each of 1,216 Rural Growth Centers (RGCs), the electrification target in the REMP. RGCs are the center of rural activities having catchment area (CA) and provide public services to the residents in villages in CA. Based on the size of potential demand, temporary electrification priority was set to 1,216 RGCs (application of Demand Criteria). In addition, to evaluate social aspects of unelectrified rural residents, advanced methods, such as Contingent Valuation Method (CVM) applied to evaluate invisible situation in monetary value and Conjoint Analysis used in the field of strategic marketing research area, are adopted. Residents' ability to pay and willingness to pay for initial cost (such as connection fee) and monthly tariff are estimated by CVM. Conjoint Analysis clarifies important property for future electrification. By taking into consideration of the differences between the actually required initial cost and ability/willingness to pay for it, policy recommendation will be elaborated.

In this paper, methodologies and process to develop logical, objective, numerical/quantitative, and convincing Master Plan are introduced, in addition to the findings. The development of REMP is still in progress and scheduled to accomplish in December 2007. By that time, selection of the optimal (or the least cost) electrification method for each of 1,216 RGCs (application of Supply Criteria), financial analysis (calculation of FIRR and EIRR), finalization of electrification priority by FIRR/EIRR, and allocation of RGCs into project phase from 2008 to 2030 will be accomplished. The Rural Electrification Master Plan will be the National Rural Electrification Plan up to 2030 after the authorization by the GRZ early in 2008.