Rural Electrification and Wind Power in Tanzania

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Present "rural electrification" in Tanzania means supplying electricity to townships and to only a few of the existing 8000 registered villages, which are not yet electrified in any considerable numbers due to technical and economical problems. the initial demand is normally low and the distanceare too great to justify the expenses of transmission lines.Thus individual power stations seem to be the only alternative.Demand figures for typical villages are evaluated, and compared to data from Europe. Out of the alternative sources of energy only one, the WIND ENERGY, is described in some detail. Some wind power theory and brief explanations of windpower terms are given. The status of current Wind powerresearch is described including a list of past and present prototypes.Based on commercially manufactured WIND DIERCY system and careful cost estimations and calculations, two energy supply schemes are proposed: one is for a telecommunication link and the other for a complete village power station of 45 KWrated output. The power station based on wind—energy was found to deliver the electricity at prices cheaper than the diesel—based scheme under certain conditions, working profitable if current electricity celling prices in Tanzania are considered.For wind—power equipment either to be chosen from industrial manufacturers or to be constructed and built in Tanzania, some operating and design criteria are discussed.

Results and measured data from own experimental work on:

a) Wind—speed measuring equipment

b) a three drum SAVONIUS rotor (vertical axis wind—turbine)

c) a two bladed horizontal axis wind energy system

are presented and briefly discussed, Conclusions are drawn from worldwide—research results and some own calculations as well, Wind- turbines appropriate for villages and possibly small townships as well, in the range of 50 to 200 KWare either manufactured commercially or in the R & D and field test stage, Wind Energy is regarded as one of the clean and inexhaustible sources of energy which is cost—competitive now or in the very near future in industrialized countries, Wind electric systems should thus be given a chance in developing countries as well since they are cost effective, compared to other sources of energy. A market survey listing the present manufacturers of wind power equipment and their programmes is added in the appendix.