



A CONCEPTUAL DESIGN FOR A TOWER TYPE CONCENTRATING SOLAR POWER PLANT NEAR HAMBANTOTA

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Abstract

In this study the basics of a central receiver type solar thermal power plant including a thermal storage are studied. Further, the technical feasibility of a central receiver type solar thermal power plant near Hambantota is investigated. The requirement of a power plant and the size of the plant are determined. The availability of solar resources in the area and the best area to locate a solar thermal power plant is also studied. The other required resources such as water, lands, proximity to transmission lines are taken into consideration.

Further the impact on the environment and the possible measures to mitigate such impacts are examined.

In addition, the technical features of a central receiver type power plant are studied and a conceptual design for such a power plant has been developed. In the conceptual design, the total required number of heliostats or reflectors, the heliostat field layout, the receiver size, the thermal storage size and the tower height have been determined.

Finally, the economic feasibility of the plant is checked considering the available soft loan facilities which can be obtained from international development banks such as Global Environmental Facility (GEF), World Bank and Japan International Cooperation Agency (JICA). The economic benefits from the Carbon credit program have also been taken into account. Finally, it is concluded that certain cost reductions and economic conditions are required for the project to be viable.