Correlation Between Central Receiver Size and Solar Field Using Flat Heliostats

Abstract

In Central Receiver Systems (CRS), thousands of heliostats track the sunrays and reflect beam radiation on to the receiver surface. The size and extent of the reflected image from the heliostats is one of the important criteria that need to be taken into account while designing a receiver, since the spillage losses may vary from 2 to 16% of the total losses. The present study aims to determine the size of an external cylindrical receiver, such that, the reflected rays from all the heliostats in the field are intercepted. A dimensionless correlation with respect to tower height, receiver size (diameter and height) as a function of heliostat size and its position is discussed in this paper. This correlation could be used as a first order approximation to arrive at the receiver dimensions quickly. When applied to the ISEGS plant the correlation yields satisfactory estimation of receiver dimensions.

The document can be accessed at:
https://link.springer.com/article/10.3103/S0003701X17030124