

**STUDY ON THE EFFECT OF ORIENTATION ON
PHOTOVOLTAIC ARRAY OUTPUT IN SELECTED
LOCATIONS OF SRI LANKA**

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DECLARATION OF THE CANDIDATE AND SUPERVISOR

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ABSTRACT

The orientation is a main factor which can influence the final output of the photovoltaic array systems. A computer-based analyzing method is used to study effects of different orientations and compare outputs to choose the possible configuration method which is best fitting to Sri Lanka.

The output was considered for a flat, a tilted, a south facing, a north facing, and both one and two axis tracking arrays. "RETScreen" software was used for analyzing of different orientations. Five geographical locations were selected to account for the entire country. Product data and metrological data were taken from the software database, and thirteen configurations were used for the calculations.

The simulation results show that, two axis tracking system and south facing with latitude angel photovoltaic arrays give the maximum energy outputs among the axis tracking configurations and fixed array configurations respectively.

The one axis tracking system and the south facing with latitude angle-array systems are the most suitable axis tracking configuration and fixed array configuration method respectively for Sri Lanka. Financial study is necessary to decide on the best method among these two.

Key words: Orientation, Configuration, Axis tracking, RETScreen



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LIST OF ABBREVIATIONS

Abbreviations	Description
BAPV	Building Applied Photovoltaic
BIPV	Building Integrated PVs
CEB	Ceylon Electricity Board
DNI	Direct Normal Irradiance
ESD	Energy Services Delivery
kW	Kilo Watt
LECO	Lanka Electricity Company
LKR	Lanka Rupees
LTES	Long-Term Energy Strategy
MW	Mega Watt
MWh	Mega Watt Hour
NASA	National Aeronautics and Space Administration
NREL	National Renewable Energy Laboratory
PV	Photovoltaic
RERED	Renewable Energy for Rural Economic Development



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