FINANCIAL ANALYSIS OF USE OF DOMESTIC SOLAR SYSTEMS IN SRI LANKA

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Degree of Master of Science

Department of Mathematics

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the degree Master of Science

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Abstract

Srilanka is a country which produces electricity via hydropower, thermal power, coal power and wind power. Mainly, the Ceylon Electricity Board and Lanka Electricity Company Pvt Ltd have the authority access to the power grid and they distribute electricity to domestic and commercial customers. Due to the droughts, crude oil prices rise, and continuous breakdowns of coal power station, the unit price of the usage had increased rapidly through- out last decade. Hence the domestic users faced more difficulties and they had to search for low cost electricity power generation methods. Initial cost of the Solar systems is very high. Therefore in my intention was to find out are there any financial benefits of investing money on solar system. According to the cost functions and the revenue functions built, it can be identified that 5.0kw system has a brake even point of 84 units for monthly. When considering the net income for the systems, 5.0kw system has higher percentage (94.60%). According to the Balance Sheet of each project, 5.0kw project is more viable for the investor. Considering the cash flow statement, 5.0kw solar system has a positive closing cash balance up to the 8th year and after that it is moving to negative values while 3.3kw system has negative values throughout the period. Project Internal Rate of Return for 5.0kw project with 60 units consumption 5.0kw system has a profit value with the amount of Rs 55, 361.80 at the end of the period and 3.3kw system has a loss value of Rs 315,912.50. These findings can be used to find a suitable investment for the viable solution to the electricity cost in Srilanka.

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NPV – Net Present Value

PV – Photovoltaic

CEB - Ceylon Electricity Board

LECO - Lanka Electricity Company (Pvt) Ltd

IRR - Internal Rate of Return

CF_0 - Initial Investment

CF_t - net after-tax cash inflow-outflows during a single period *t*

n - Each Period

N- Holding Period

P & L - Profit & Loss

DC - Direct Current

AC- Alternating current

USA – United State of America