Feasibility Study on Solar Photovoltaic Office Air Conditioning in Sri Lanka  

Abstract  

Due to the rapid depletion of fossil fuel resources and global concern on Green House Gas emissions, sustainable energy technologies have become important in Heating, Ventilation and Air Conditioning (HVAC) systems in buildings. As a result, much focus is given on research and application based on solar powered HVAC, in various parts of the world. Such initiatives are of timely importance in Sri Lankan context due to the availability of good solar energy potential.  

In this work, an existing air conditioning system for an office building of 51m$^2$ in Sri Lanka was taken into study. An economic evaluation was performed using HOMER (Version 2.68 beta) to assess the feasibility of using Solar PV (SPV) to power the air conditioning system. The results show that under present circumstances, the Levelized Cost of Energy (COE) of the optimized photovoltaic stand alone system lies far above that of the grid powered. It further depicts that grid integration would bring down the COE of the SPV system closer to the range of the main grid. Hence in current conditions, grid integration is the way forward for SPV assisted air conditioning in Sri Lanka.