PERFORMANCE ANALYSIS OF SOLAR INSTALLATION AT CCE

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ABSTRACT

Global warming has been the single most dominating factor that concerns the very existence of life on this earth. There has been debate among scientists over the probable causes and the possible solutions to counter global warming. One of the most promising solutions has been to reduce the usage of hydrocarbon-based fuels. This in turn would reduce the emission of Carbon-di-oxide into the atmosphere and hence reduce the adverse effect on the ozone layer around the earth.

Most heads of the governments around the globe have been promoting the use of renewable energy to meet their energy demands. Solar energy has been in the forefront among the sources of renewable energy to substitute the energy from fossil fuels. Sultan Qaboos, the ruler of the Sultanate of Oman and a dynamic leader of the middle-east region has been vigorously promoting the development and usage of renewable energy in the country. To realize this long-term vision of the government of Oman, Caledonian College of Engineering, a private institute in the region has switched to Solar Energy to meet part of its electrical needs. This initiative by the college has shown its commitment towards fulfilling the vision of the government of Oman and the rest of the world, by generating and utilizing the clean and environment friendly energy in its campus.

In its first phase, the college has installed solar panels in their existing campus for generating about 15 kWh of energy per day. This project was undertaken to do a performance analysis of the solar system installed in the campus and do a life cycle costing of the system. The performance analysis was done based on two types of measurements: data recorded by the state of the art charge controller and V-I characteristics of the panel. The knowledge gained from this project would be used by Caledonian College of Engineering to implement solar energy system of higher capacity in their upcoming new campus.