# Solar power water pump studies for small-scale irrigation

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## Declaration

This research paper is based on our own research work. Contributions made by anyone else have been indicated in the acknowledgements and the resources defined.

This work was done under the supervision of Khan M Nazir of the University of Management and Technology.

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# Abstract

This report outlines solar based water pump irrigation studies. The following report has several options of water pumps for different applications. We also carried out experiments to select the most suitable solar panel type. Shortage of water is the main reason why it is necessary to build an irrigation system by them. Our main goal in this project is too build an irrigation system powered by solar energy. Something that can be easily operated by farmers. Photo- voltaic (PV) modules are used in our project to power a water pump. For back up storage a storage tank can be used.

This report basically demonstrates the usefulness and application of solar PV to provide energy for pumping requirements in Pakistan. This report elaborates on the different types of solar collectors that can also be used for solar power generation. It discusses the technical and economic feasibility of solar projects in a semi-arid country like Pakistan.

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# 1. Introduction

Pakistan is facing one of the world's worst energy crises. Its natural gas reserves are depleting. The gap between the supply and demand of the country's electric power is getting bigger and bigger as shown in graph 1. This will lead to higher rate of load shedding and an increase in the cost as well. The Pakistani market is the perfect place for clean energy. The fact that the country gets 5.45kWh/$m^2$ a day of solar radiation makes it ideal for solar energy powered systems. And that is what our project aims to do.