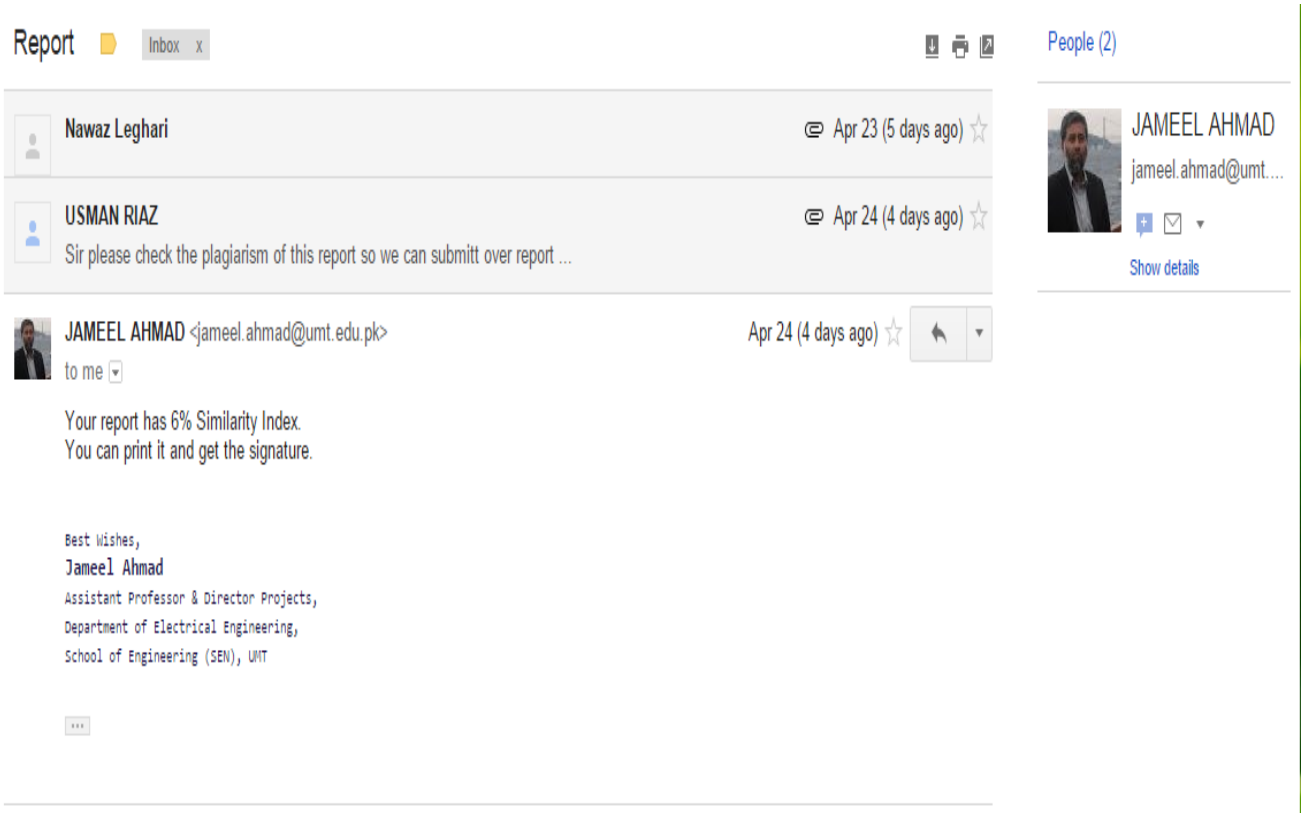
2014

Efficient Solar System for Domestic Load

Final Year Project Report



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FINAL YEAR PROJECT REPORT

Submitted to:

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Chapter 1

Introduction

1.1 Project Background:

Solar energy is the ultimate source of energy from millions of years and it is a renewable energy.This energy consists of radiant light and heat energy from the sun.Out of all energy emitted by sun only a small fraction of energy is absorbed by the earth.Just this tiny fraction of the sun's energy that hits the earth is enough to meet all our power needs.Using present solar techniques some of the solar energy reaching the earth is utilized for generating electricity. Even then the energy demand met by using solar energy is very less.

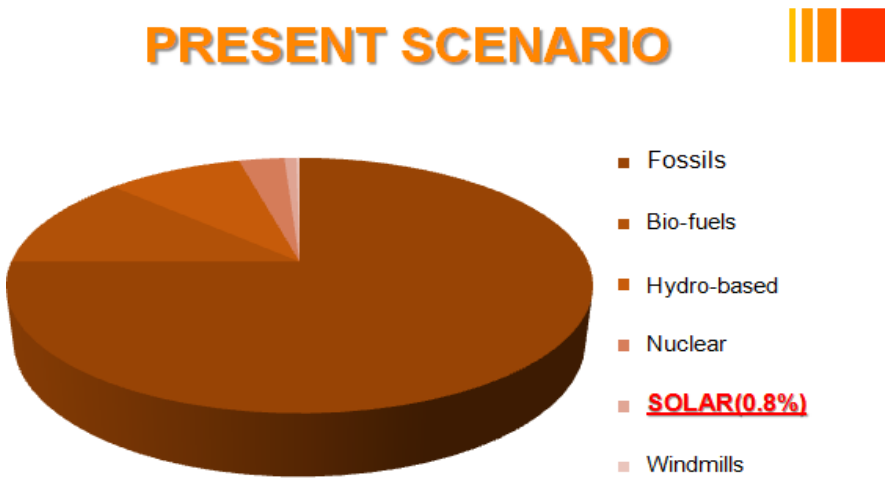
Solar Energy originates from the nuclear reaction that constantly take place on the sun.The surface of the Earth receives 47% of the total solar energy that reaches earth.The biggest advantage of solar energy is that all the harmful chemical and radioactive by-product of the nuclear reactions are left behind on the sun and the pure radiant energy reaches us which is ready to use.

1.1.1 How solar energy is used

We can use solar energy by converting it to electrical energy . So we must use a device called solar panels which can convert the light energy into electrical energy. Solar panel is a group of solar cells.Solar cells works on the principle of photoelectric effect.

When a light of certain frequency falls on the surface of a metal, electrons will absorb the energy.If incident light energy is greater than the work function (minimum energy required to remove the loosely bound valence electrons)of the metal ,then the photo electrons will be emitted and the excess energy is converted to the kinetic energy of electron. When solar panels are placed in the sunlight, photons will strike the surface and emits electrons.As a result electron hole pair is created in

the solar cell.When external circuit is connected to the solar cell , electrons flow in the circuit and the current is generated.



The solar energy from the sun is utilized in the following order:

1. Collection
2. Conversion