

ALL INDIA SHRI SHIVAJI MEMORIAL SOCIETY'S
COLLEGE OF ENGINEERING

1, Kennedy Road, Near RTO Pune-411001.



Department of First Year Engineering

Certificate

This is to certify that the following students:

1. Pratik Pingale	19CO056
2. Rohan Dayal	19CO060
3. Sagnik Roy	19CO061
4. Tanay Zope	19CO074
5. Yash Tatiya	19CO067

have completed all the Term Work & Practical Work in the subject **Problem Based Learning (PBL)** satisfactorily in the department of First Year Engineering as prescribed by Savitribai Phule Pune University, in the academic year 2019-2020.

Faculty-in-charge

Head of Department

Principal

Date:

Solar City

A Report submitted in partial fulfilment of the requirements to complete Term Work & Practical Work of Problem Based Learning (PBL) in the department of

FIRST YEAR ENGINEERING

As prescribed by

SAVITRIBAI PHULE PUNE UNIVERSITY

By

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Abstract

Now-a-days most of the people depend upon non-renewable sources to produce electricity due to the old conventional ways. Solar energy has been proven to be more viable and cost effective than the normal methods to produce energy. Solar energy, radiation from the sun capable of producing heat, causing chemical reactions, or generating electricity. The total amount of solar energy incident on Earth is vastly in excess of worlds current and anticipated energy requirements. it is the cleanest and the most abundant renewable energy source available, and the U.S. has some of the richest solar resources in the world. Solar technologies can harness this energy for a variety of uses, including generating electricity, providing light or a comfortable interior environment, and heating water for domestic, commercial or industrial use.

It is a very flexible energy technology and can be built as distributed generation or as central station, utility-scale solar power plant. Both of these energies can also store the energy they produce for distribution after the sun sets, using cutting edge solar + storage technologies.

Introduction

How do we use energy at school? Does anyone know from where we get our electricity? Most of the electricity in the world is created by burning coal! What is the problem with burning coal? As everyone knows that this process produces leads to greenhouse gas emissions that lead to poor air quality and global climate change.

Coal is a nonrenewable resource that must be mined from the earth; mining can be harmful to the environment. As engineers, we must find better ways to create the energy we rely upon every day to power our houses, schools, libraries, supermarkets, sports arenas, stores, businesses and all of the other buildings in our city! Luckily, we have the sun to help us with that!

Solar panel is sort of like a battery, but instead of storing chemical energy, it converts the energy we get from the sun into electricity. When a house or building uses a row of two or more solar panels, we call this a solar array. The roofs of buildings are exposed to the greatest amounts of sunlight and are better than the ground for being clear of any trees or other buildings that might cause shade.

As it turns out, many countries suffer from what is sometimes called "energy poverty". When no electricity is available or when an electricity shortage exists in a city or a town, we say this area suffers from energy poverty. This happens because a country cannot afford or does not have enough resources to create all of the electricity it needs. Sometimes these areas are without power for hours or days! Some places exist without any electricity at all! Can you imagine what it would be like to wake up in the morning and not have any electricity?

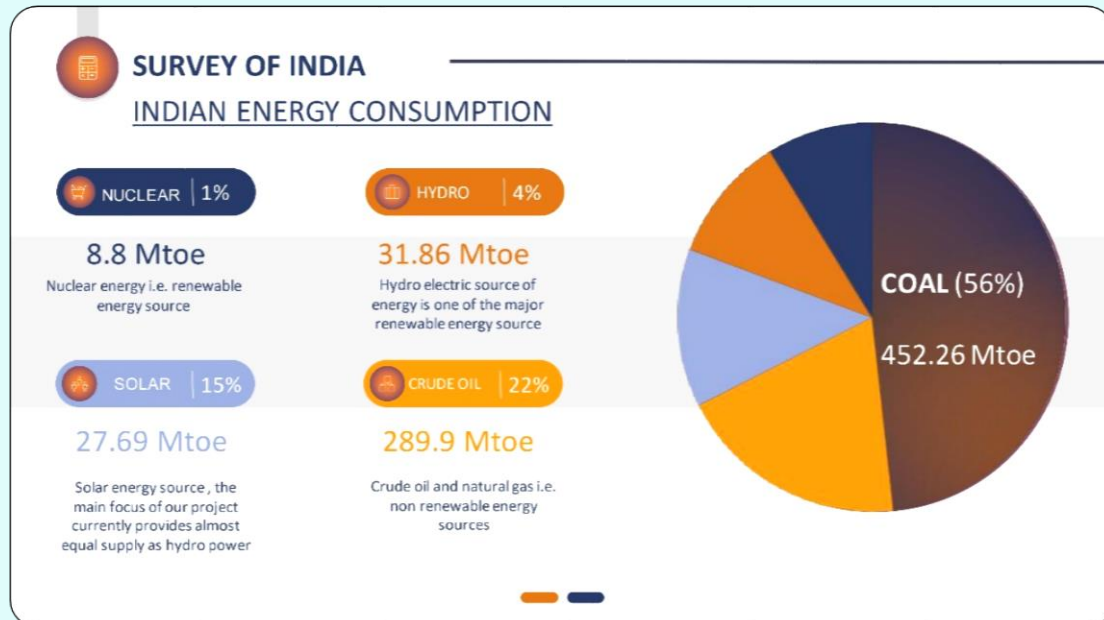
Now that you know how a solar panel works, how they can be applied to buildings? Let's start designing Solar City.

The main objective of our project is to make people aware about the benefits and advantages that can gain by replacing the traditional conventional energy sources by solar energy. It is capable enough to reduce the monthly electricity bill by huge percentage. Plus, it is ecofriendly and readily available. We won't just stop with the solar energy; we would like to show benefits of all non-conventional resources over the conventional ones.

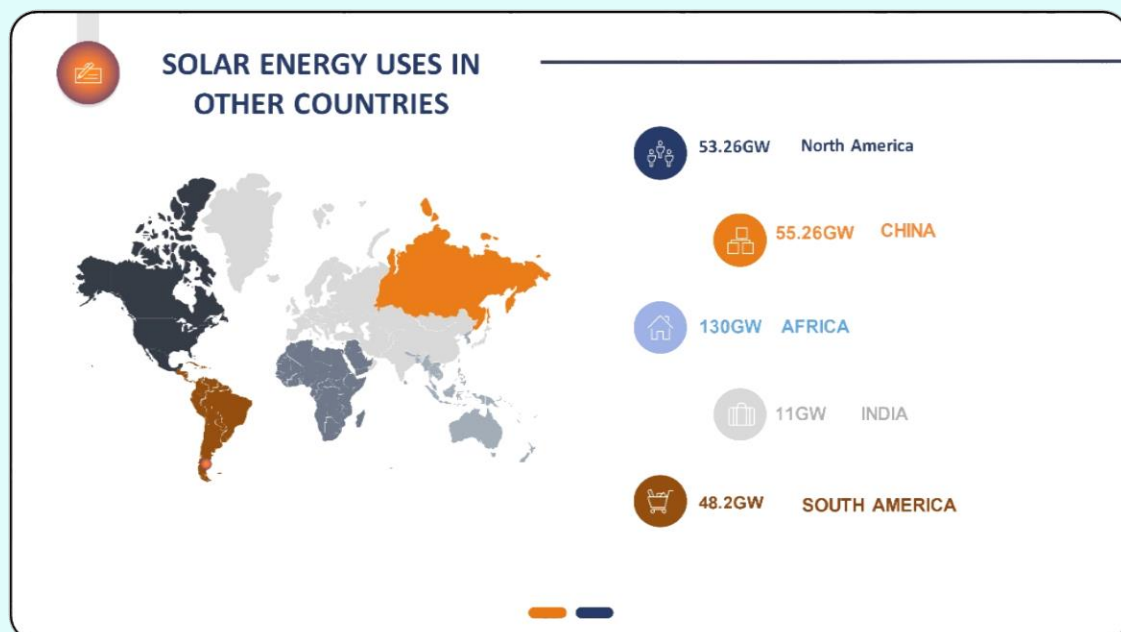
We would like to present you the solar city model that shows the advance working and reliable construction of the city. The idea is to produce a city design which consume less polluting energy source and rely on solar and other renewable energy source for the primary need.

We hope our model would influence technicians to implement it in the designing of the future cities.

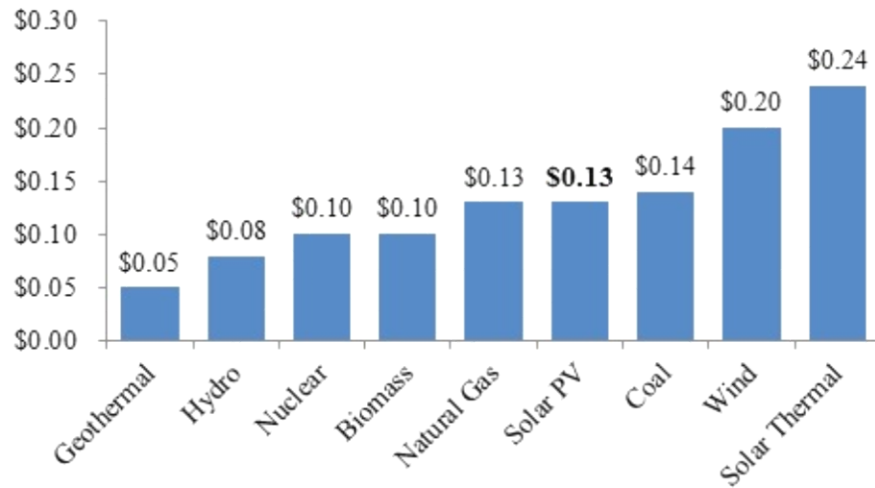
Following data shows Average Energy Consumption of India



Following data shows Global Solar Energy Consumption

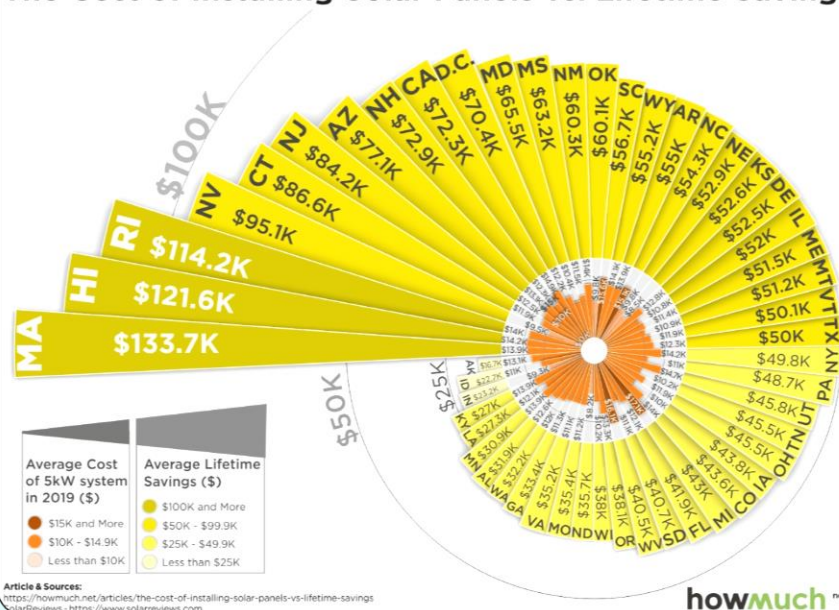


Following data shows Cost/KWh for Energy Source

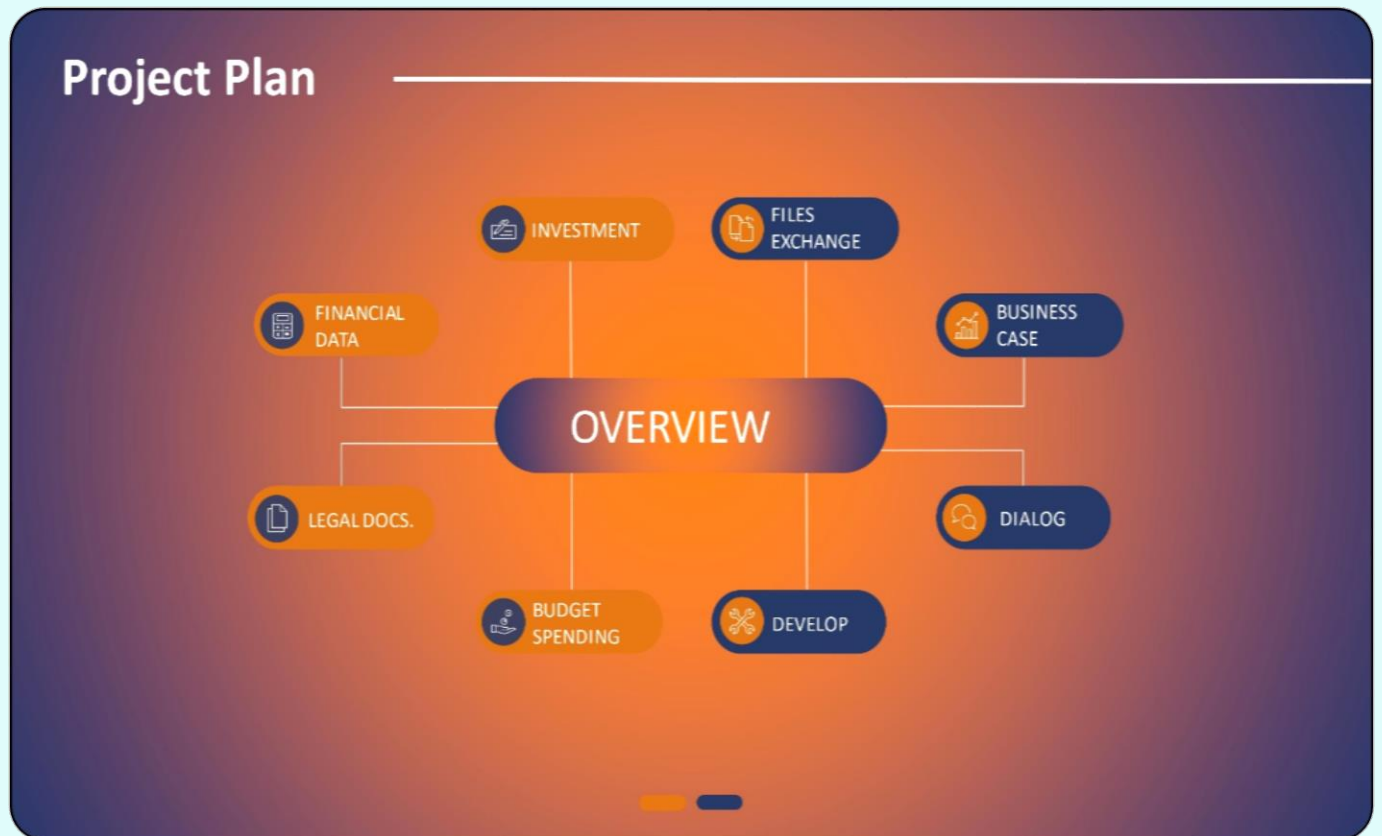


Source: US DOE Annual Energy Outlook 2014

Following data shows Solar Panel Installing Cost Vs Lifetime Saving



Project Plan



Advantages of Solar Energy: -

- As it is a renewable energy it is an infinite energy source.
- Solar energy is quite energy efficient.
- As energy efficiency increases cost efficiency also increases.
- Use of solar energy quite diverse.
- Effect of solar energy on environment is quite low.

Disadvantages of Solar Energy: -

- Initial cost of purchasing a solar system is quite high.
- Solar panel are dependent on sunlight to effectively gather solar energy.
- Solar energy has to be used right away, or it can be stored in large batteries which are expensive.
- Solar power system uses a lot space as electricity is directly proportional to sunlight.

Applications of Solar Energy: -

- Solar Heating and Solar Distillation.
- Solar drying of Agriculture and Animal Products.
- Solar Furnace and Solar Cooking.
- Solar Electric/Thermal power generation.

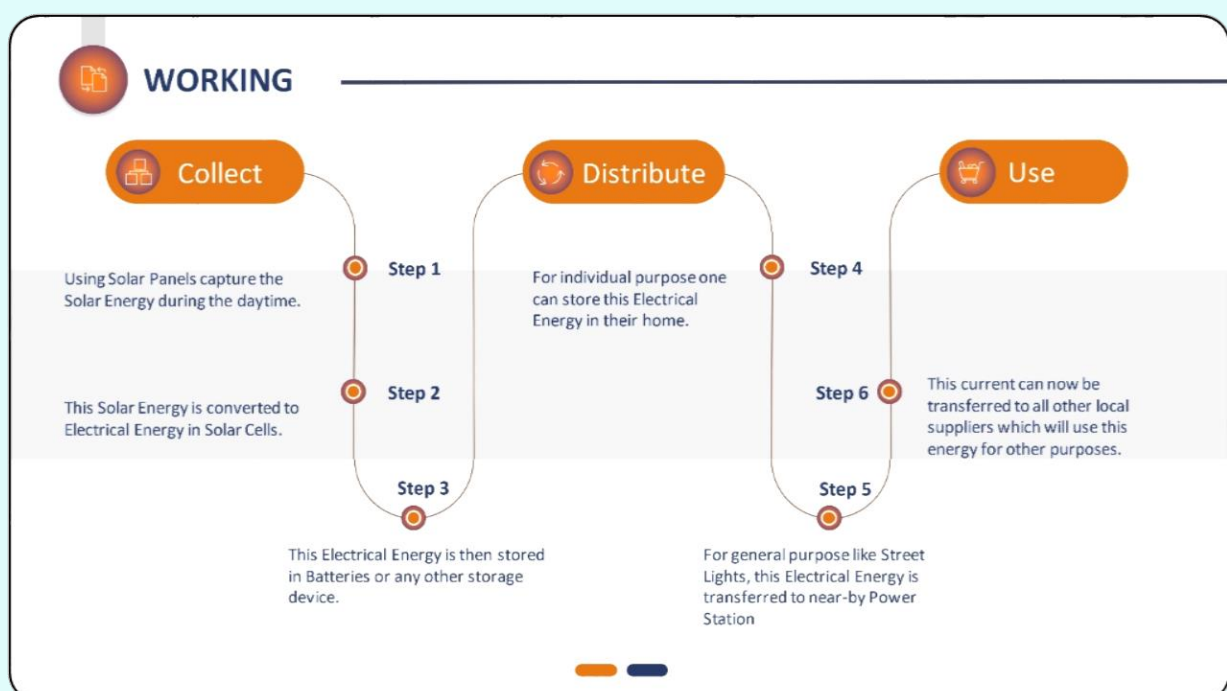
About Project: -

- This project is based on a solar city model that shows the advance working and efficient usage of solar energy.
- The idea is to produce a city design which consume less polluting energy source and rely more on solar and other renewable energy.
- This project also provides some futuristic ideas of efficient application of solar energy

Requirements: -

- Thermocol Board (Styrofoam)
- Origami Paper
- Paper Glue (Fevicol)
- Hot Glue Gun
- Hot Glue Stick
- Toy Car

Processes Involved: -



Cost Analysis: -

1. Cost of equipment: -

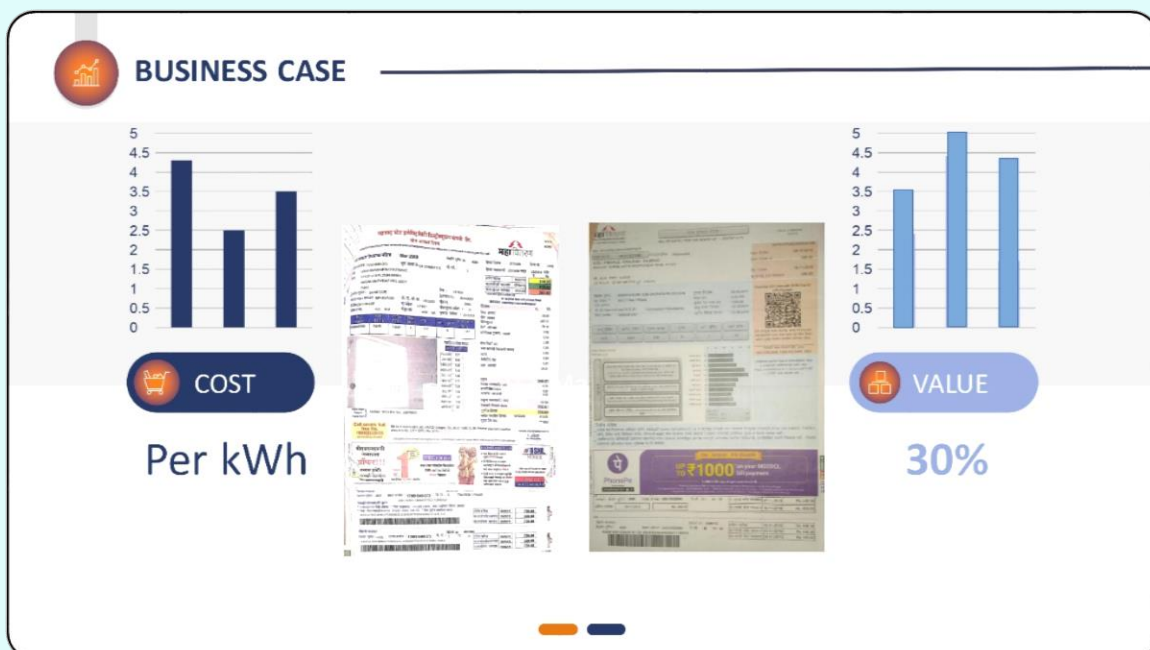
ITEMS	COSTS
THERMOCOL (STYROFOAM)	105 ₹
ORIGAMI PAPER	20 ₹
PAPER GLUE (FEVICOL)	20 ₹
HOT GLUE GUN	1130 ₹
HOT GLUE STICK	200 ₹
TOY CAR	0 ₹

2. Cost of Project: -

Summing up all the above cost we have net cost as

1475 ₹

3. Cost comparison financially: -



Glimpse of the project



Conclusion

- Successfully reduce the cost of clean energy.
- Set up charging station for fleet of fuel efficient vehicles.
- Accurately brought down homeowner's electricity bill per month.
- Serves 14 states, 25000 customers with 25 local operating centers.
- Helps the environment by wasting less energy and requiring less new energy production
(energy efficiency).
- Recognized with environmental leadership awards by Aspen Institute and Actera.
- Recognized as The Green Power Supplier of the year by DOE in 2010.

Reference

- <http://www.quora.com>
- <http://www.seminaronly.com>
- <https://www.encyclopedia.com>
- <https://www.alldatasheet.com>
- <https://mnre.gov.in>
- <https://seci.co.in>