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# Analysis of Scope of Solar Energy In Indian Economy

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## ABSTRACT

This study is totally based on the various scope of solar energy in term of product based opportunity, service based opportunity and installation capacities of various companies which have been involved insolar cell manufacturing as well as solar module manufacturing activities also. In this study researcher used simple linear regression analysis by using SPSS software for two tailed based hypothesis testing of various types of variables mostly they belong to dependent and independent variable also. In this study researcher considered to installation capacities of solar cell manufacturing companies as a dependent variable as well as installation capacities of solar module manufacturing companies as an independent variable also.At last the researcher concluded in this study that there is no relationship between installation capacities of solar cell manufacturing companiesand installation capacities of solar module manufacturing companies also.

**KEYWORDS**: Solar Energy, Installation Capacity, Cell, Module, Renewal Sources etc.

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# I)INTRODUCTION

India is highly experienced with the problem of global warming;global warming is also responsible to modify the climate at extent level. There are various majorreasonsare also responsible for changing the climate such as that,

1) Overland temperature of air are increasing now day.
2) Air temperatures over ocean are increasing.
3) Ice of Artic Sea is decreasing.
4) Melting the Glaciers at extent level.
5) Raising theSea levels.
6) Humidity.
7) Increasing the heat content ocean.
8) The temperature of Sea surface is also increasing at extent level.
9) More fossil fuel carbon in the air.
10) Deforestation.
11) Agricultural & Farming.
12) (office)

The problem of Global warming are arise due to greenhouse gases, burning fossil fuels, deforestation also. All of these are major causes of the global warming but burning of fossil fuels is most major cause of global warming among themselves. The demand of fossil fuel can be replaced by using solar upgraded technology as well as solar product made of solar technology based equipment. Solar power is responsible for the creation of large amount of electricity without any supply of fossil fuel also. The $Co_2$ free power source of renewal energy is the most important features of solar power.

Solar energy is the clean source because there is no chance of emission of greenhouse gases into the atmosphere when persons are using solar panel for creation of electric city.

## I.1) WHY SOLAR ENERGY IS IMPORTANT

Solar energy is most important source of renewal energy,the sun is the main origin of this energy it's produced from the sun in abundance quantity and it is free from any types of pollution which are causes of global warming there by problem of climate changes arises nowadays.

## I.2) NATURE OF THE SOLAR ENERGY

The nature of solar energy is non-pollutant as well as conventional source of energy which are available in abundance quantity on the earth, the earth receive always $1.2x10^{17}w$ of energy or

power from sun. The India receives solar power or energy just approximate to 5000 trillion KWhr per year.

## I.3) BENEFIT OF SOLAR ENERGY

There are various types of benefit of solar energy, they are:-

1. Solar energy is a free source of renewal types of energy.
2. By the help of solar energy peoples can do Proper utilization of canal cover as well as barren land also.
3. Beneficiaries of solar panel power of industries are entitled to get tax depreciation.
4. There is no concept of fuel consumption also.
5. There are no chances of any sound and air pollution.
6. Reduces the electricity bills at extent level by the help of solar energy.
7. Maintenance cost of solar energy is very low.
8. Beneficiaries of solar panel power of households are entitled to 30% rooftops subsidy.

## I.4)PRODUCT BASED OPPORTINUTIES

There are various types of product based opportunities of solar energy such they are:-

1) Distributer & selling the solar based product
2) Inventor of solar based products
3) Solar based Toilet
4) Solar based Tools
5) (it), 2010)Solar based pumps
6) Telecom based Towers
7) Solar based street light
8) Solar based shelter
9) Manufacturing

## I.5) SERVICES BASED OPPORTINUITIES

There are various types of services based opportunities of solar energy such as :-

1) Training
2) Solar Repairs
3) Solar AMC
4) Legal Advisor
5) Solar third party survey

## I.6) SCOPE OF THE STUDY

This study is able to reveal about the scope of solar energy in Indian economy. Reader is very easily know about the need of the solar energy and importance of solar energy as well as know about the various scope of services based and business based opportunities Reader is also know about the installation capacity of solar cell manufacturing companies. Reader is also know about the scope of the other renewal sources of solar energy such as wind, hydro, biogas also.

## II) OBJECTIVES OF STUDY

- To find out the installation capacity of solar cell manufacturing companies.
- To find out the installation capacity of the solar module manufacturing companies.
- To find out the scope of solar energy and compare with another sources of renewal energy

## III) RESERCH METHODOLOGY

This study is totally based on the study of solar energy. This solar energy based study totally based on the secondary data sources. The data are collected from every possible source. For better presentation of data researcher used appropriate tools and technique of data analysis and for collection of data, researcher used best method of research.For hypothesis testing, researcher used the linear regression analysis by using the a dependent variable and another independent variable because researcher has to find out a relationship between two variables such as a dependent variable is “installation capacities of solar cell manufacturing companies” and another independent variable is “installation capacities of solar module manufacturing companies”, the number of 10 observations are involved in each variables either this is dependent variable as a “installation capacities of solar cell manufacturing companies” or other is independent variables is “installation capacities of solar module manufacturing companies”.

## III.I) DATA COLLECTION SOURCES:-

**III.II) SECOUNDARY DATA SOURCES: -**This study is totally based on the secondary data based research. Secondary data is to be derived from the various web sources as a secondary data sources have also used in this solar based study and some other types of secondary data are derived from the solar energy based workshop also.

**III.III) DATA ANALYSIS SOURCES:-**Data is analysis through the various types of graph, tables as well as charts also.

## III.IV) HYPOTHESIS

The hypothesis are totally based on the objectives of this study, they are capable to find out the findings & conclusions of this study. There are various types of hypothesis of my study such they are:-

- There is no relation in installation capacity ofsolar cell manufacturing companies and installation capacity of the solar module manufacturing companies.

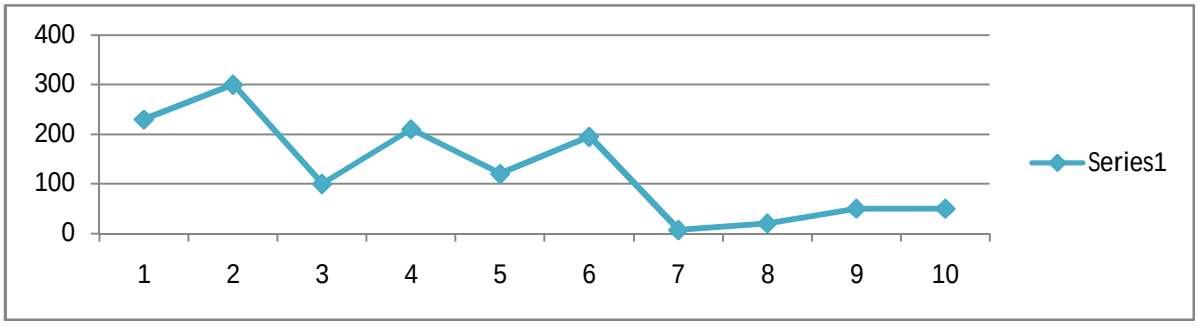
## IV) ANALYSIS OF DATA& INTERPRETATIONS

Data was to be analyzed by the researcher with the help of various types of table, charts and by the help of various graphs whose are very helpful to present a data in very efficient and effective way through which any laymen or any persons are capable to understand analysis properly to them at extent level.

**Table 1: Solarmodulemanufacturingcompaniesinstallation Capicity**

| S.N0 | PARTICULAR | INSTALATION CAPICITY (M.W.) |
|---|---|---|
| 1 | MoserBaerSolarLimited | 230 |
| 2 | TataPowerSolarSystemsLimited | 300 |
| 3 | WebsolEnergySystemLimited | 100 |
| 4 | XL Energy Ltd | 210 |
| 5 | SuranaSolar | 120 |
| 6 | SolarSemiconductor | 195 |
| 7 | UPVSolar-UdhayaEnergy Photovoltaics | 7 |
| 8 | Maharishi Solar Technology | 20 |
| 9 | CentralElectronicsLimited | 50 |
| 10 | BharatHeavyElectricalsLimited | 50 |
| | TOTAL (IN MEGA WATT) | 1282 |

**GRAPH 1:**



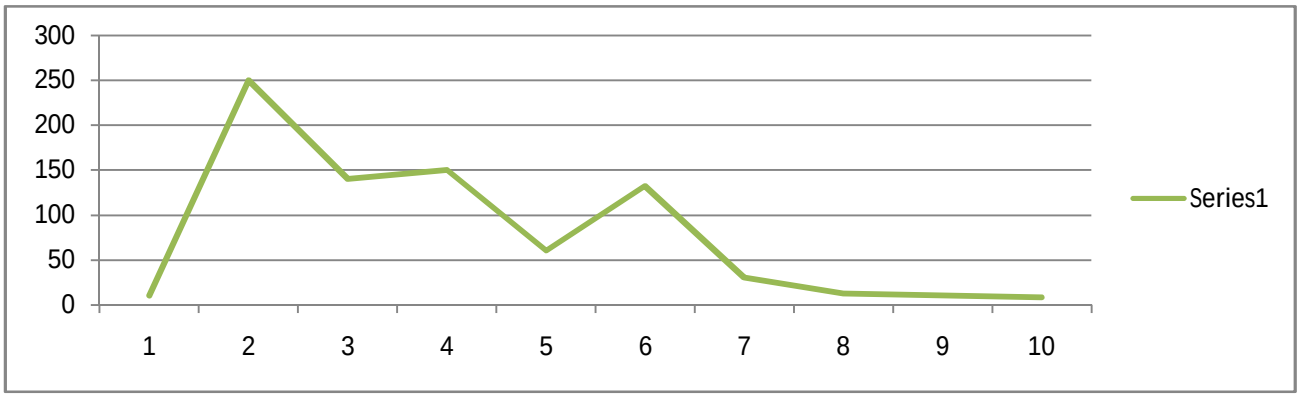

**INTERPRETATIONS 1:**

By analyzing the data properly researcher has able to conclude that Tata Power Solar Systems Limited has highest installation capacity i.e. 300 Mega Watt among various solar modulemanufacturing companies but UPV (UdhayaEnergy Photovoltaics) has lowest installation capacity i.e. 7 Mega Watt among various types of solar module manufacturing companies.

**Table 2: Solar CellManufacturingcompaniesinstallationcapacities**

| S.NO | PARTICULAR | INSTALLATION CAPICITY (M.W.) |
|---|---|---|
| 1 | Central Electronics Limited | 10 |
| 2 | MoserBaerSolarLimited | 250 |
| 3 | TataPowerSolarSystemsLimited | 140 |
| 4 | WebsolEnergySystem | 150 |
| 5 | XLEnergyLtd | 60 |
| 6 | SuranaSolar | 132 |
| 7 | SolarSemiconductor | 30 |
| 8 | UPVSolar-UdhayaEnergyPhotovoltaicsPvtLtd | 12 |
| 9 | MaharishiSolarTechnology | 10 |
| 1O | BharatHeavyElectricalsLimited | 8 |
| | Total (M.W.) | 802 |

**GRAPH 2:**



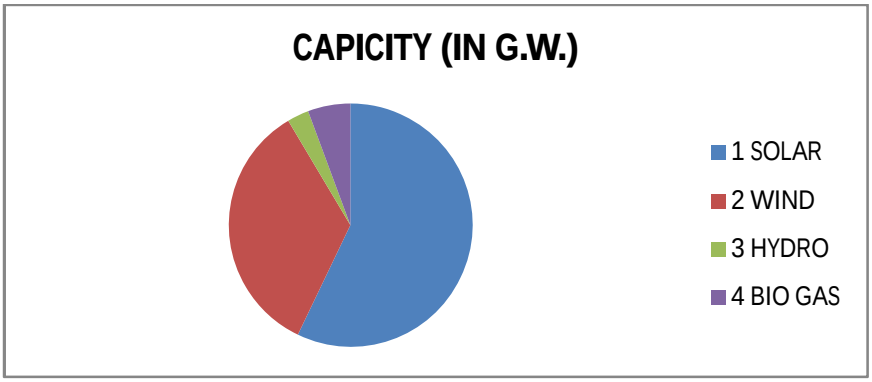

**INTERPRETATIONS 2:**

By analyzing the data properly researcher has able to conclude thatMosear Baer Solar Systems Limited have highest installation capacity i.e. 250 Mega Watt among various solar cell manufacturing companies but maharishi solar technology has lowest installation capacity i.e. 8 Mega Watt among various types of solar cell manufacturing companies**.**

**TABLE 3:ROADMAPFORRENEWABLE POWERBY2022**

| S.NO. | PARTICULAR | CAPICITY (IN G.W.) |
|---|---|---|
| 1 | SOLAR | 100 |
| 2 | WIND | 60 |
| 3 | HYDRO | 5 |
| 4 | BIO GAS | 10 |

**GRAPH3:**




**INTERPRETATIONS 3:**

Solar power is a renewal source of energy among various types of solar energies. It has highest scope in India. Each and every layman properly interpreted by the help of table and graph that solar has highest installation capacity i.e. 100 Giga Watt so this chart is concluded properly that solar energy has highest scope as a renewal sources of energy in India compare to other sources of energies such as wind, hydro, biogas in future time. Bio gas is also other type of renewal sources of energies, It has lowest scope in term of installation purpose i.e. 10 Giga Watt in future time in India.

## IV.I) HYPOTESIS TESTING

In the hypothesis testing researcher used simple linear regression analysis by using two types of variables such as dependent variable is "installation capacity of solar cell manufacturing companies" and independent variable is "installation capacity of solar module manufacturing companies" The no. of 10 observations has used in each types of variables either variable is dependent nature as "installation capacity of solar cell manufacturing companies" or variable is independent nature as "installation capacity of solar module manufacturing companies" to find-out the relationship between them with the help of spss software by applying simple linear regression analysis. Reader can considered that the null hypothesis of my study is based on two tail hypothesis testing because my research based null hypothesis is that :-

"There is no relation in installation capacity ofsolar cell manufacturing companies and solar module companies."

**Here reader has to understand the following terminologies i.e.**

**NULLHYPOTHESIS:-** $H_0: IC_{SCMC} \neq IC_{SMMC}$

**$H_o$= Null Hypothesis**

**IC = Installation Capacity**

**$S_{CMC}$=Solar Cell Manufacturing Companies**

**$S_{MMC}$ = Solar Module Manufacturing Companies**

The null hypothesis of my study is based on two tail hypothesis testing because my research based null hypothesis is that:-"There is no relation in installation capacity ofsolar cell manufacturing companies and solar module manufacturing companies"

**TABLE 4:**

| PARTICULAR | SOLAR MODULE MANUFACTURING INSTALATION CAPICITY (M.W.) | SOLAR CELL MANUFACTURING INSTALLATION CAPICITY (M.W.) |
|---|---|---|
| Moser Baer Solar Limited | 230 | 250 |
| Tata Power Solar Systems Limited | 300 | 140 |
| Websol Energy System Limited | 100 | 150 |
| XL Energy Ltd | 210 | 60 |
| Surana Solar | 120 | 132 |
| Solar Semiconductor | 195 | 30 |
| UPV Solar - Udhaya Energy Photovoltaics | 7 | 12 |
| Maharishi Solar Technology | 20 | 10 |
| Central Electronics Limited | 50 | 10 |
| Bharat Heavy Electricals Limited | 50 | 8 |
| TOTAL (IN MEGA WATT) | 1282 | 802 |

**TABLE 5: ANOVA**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 24566.946 | 1 | 24566.946 | 5.166 | .053[b] |
| | Residual | 38044.654 | 8 | 4755.582 | | |
| | Total | 62611.600 | 9 | | | |

a) Dependent Variable: solar cell manufacturing companies (installation capacity)

b) Predictors: (Constant), solar module manufacturing companies(installation capacity)

**INTERPRETATIONS 5:**

The table no.4 revealed about the capacities of various companies whose are involved in solar cell manufacturing companies as The table no. 5, derived from simple linear regression analysis by using two types of variables they are 1) Dependent variable 2) Independent variable there are two types of variable are used in this study one of them Dependent variable and other is independent variable, in this study, researcher used dependent variable is installation capacity of solar cell manufacturing companies and independent variable is installation capacity of solar module manufacturing companies with the help of spss software. It is anova model table which is very useful for the purpose of analyzing a hypothesis testing. Resecher are capable to judge very easily that null hypothesis significant value of table is above from the specific value 0.050 than we can say that our null hypothesis is accepted otherwise rejected.

It is the important table for the purpose of the hypothesis testing;it is a significant model because the significant value of table is .053 which is above from the value .050, so we can say that our null

hypothesis is accepted and revealed that there is no relation between the installation capacities of solar module manufacturing companies and the installation capacities of solar cell manufacturing companies.

## V) SIGNIFICANCE OF MY STUDY

Most important significance of this research is that each and every layman is understand very easily about the upcoming scopes and various types of opportunities regarding the solar energy at extent level. The most important features of this research is that young generation can aware with various types of needs and importance of solar energy as well as various other sources of renewal energy.

## VI) CONCLUSION:-

After analyzing the data in regarding the various term such as table, graph as well as interpretation of data. There are various types of conclusions may be derived from this research, they are:-

1) The Tata Power Solar Systems Limited has highest installation capacity i.e. 300 Mega Watt among various solar module manufacturing companies but UPV (Udhaya Energy Photovoltaics) has lowest installation capacity i.e. 7 Mega Watt among various types of solar module manufacturing companies.
2) The Mosear Baer Solar Systems Limited have highest installation capacity i.e. 250 Mega Watt among various solar cell manufacturing companies but maharishi solar technology has lowest installation capacity i.e. 8 Mega Watt among various types of solar cell manufacturing companies**.**
3) The solar has highest installation capacity i.e. 100 Giga Watt so this chart is concluded properly that solar energy has highest scope as a renewal sources of energy in India compare to other sources of energies such as wind, hydro, biogas in future time.
4) There is no relation between the installation capacities of solar module manufacturing companies and the installation capacities of solar cell manufacturing companies. There are various types of companies have involved in solar cell manufacturing companies andsolar module manufacturing companies, Researcher has find out from this study by applying regression analysis with the help of SPSS software in hypothesis testing that " there is no relation between the installation capacities of solar cell manufacturing companies and solar module manufacturing companies.
5) The nature of solar energy is non-pollutant as well as conventional source of energy which are available in abundance quantity on the earth. There are various types of benefit, business

based opportunities as well as service based opportunities has been find-out in this study by the researcher.

6) The earth receives always $1.2x10^{17}$w of energy or power from sun. The India receives solar power or energy just approximate to 5000 trillion KWhr per year.

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