



A PROJECT REPORT

On



“RENEWABLE ENERGY”

Submitted under

COMMUNITY SERVICE PROJECT

In Partial fulfillment of I B.Sc,

1st Internship as per the revised APSCHE/CBCS Curriculum

Based on the Survey Conducted at

The Place of Execution of CSP: **Rami Reddy Palli Road, Jammalamadugu**

Submitted By

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I B Sc (M.P.C)

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I also extend my heartfelt thanks to all the Stake holders of the houses in Ramireddy Palli Road near Government Degree College, Jammalamadugu Both Urban and Rural for their cooperation rendered to me in carrying out this Community Service Project work in a smooth and fair manner.

Finally, I convey my thanks to all those who have co-operated and supported me directly or indirectly to complete this project work successfully.

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DECLARATION

I hereby declare that this Project Work report entitled “**RENEWABLE ENERGY**” is entirely original and is carried out by me in and around Jammalamadugu town belong to the Department of Physics, Government Degree College, Jammalamadugu under the mentorship/supervision of **Sri. P. Siva Rami Reddy, Lecturer in Physics, GDC Jammalamadugu**. I further declare that this Project Report has not been submitted for the award of any Degree, Diploma of any other University or Institution.

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Date:
Place: **Jammalamadugu**

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CERTIFICATE

This is to Certify that the present project report entitled “**RENEWABLE ENERGY**” submitted by **G. HYMAVATHI** bearing **Regd No: 216027052002** towards **Community Service Project (CSP)** which is in Partial fulfillment of I B.Sc, 1st Internship as per the revised APSCHE/CBCS Curriculum of Yogi Vemana University, Kadapa is a record of bonafide project work actually carried out by her in and around Jammalamadugu town under my Mentorship/Supervision belong to the Department of Physics, Govt. Degree College, Jammalamadugu. The results embodied in this project report have not been submitted for any other Degree or Diploma.

Sri. P. SIVA RAMI REDDY

Lecturer in Physics

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Commissionerate of Collegiate Education , Government of Andhra Pradesh

Community Service Project (CSP)

GDC ,JAMMALAMADUGU.KADAPA (Dist)

Questionnaire for CSP

1	Name of the Student	Gr. Hymavathi
2	Year&Regd. No. of Student	2021-22.
3	Program studying (B.Sc)	I B.Sc (M.P.C)
4	Name of the Mentor	Sri.P.SIVA RAMI REDDY
5	Name of the CSP	RWNEWABLE ENERGY
6	Place of CSP execution	GOVT. DEGREE COLLEGE ROAD.JAMMALAMADUGU

Name & occupation of person /OWNER-- Gr. Pullaiah

- 1)what type energies using mainly for cooking and house hold purpose ?
(a) Fossile fuels (b) non fossile fuels (c) none.
- 2)how much of electricity bill amount ,nearly you got for month?
(a) > Rs100 (b) > Rs500 (c) > Rs1000 (d) > Rs1500
- 3)Do you want reduce the electricity bill and domestic LPG bill ?
(a) Yes (b) No (c) None
- 4).Do you known about non-renewable and renewable energy sources ?
(a) Yes (b) No (c) Partially idea
- 5) Do you know about non -renewable energy sources ?
(a) Fossile fuels (b) non-Fossile fuels (c) Solar energy (d) none
- 6) Why we have not depend on non-renewable energy sources ?
(a) Fossile fuels are less(b) Fossile fuels are high(c) None
- 7)Do you about Renewable energy sources?
(a) Yes (b) No (c) partially idea.
- 8) Do you known about solar energy ?
a) Yes (b) No (c) partially idea.
- 9) Do you known solar energy ,wind energy ,bio gas,etc. sources are ?
(a) Renewable (b) Non renewable (c) None
- 10)Are you using solar energy in your, home or Agriculture ?
(a) Home (b) Agriculture (c) Industry (d) All
- 11)Are you using Bio gas from biomass ,for cooking purpose in home as Renewable energy?
(a) Yes (b) may be (c) No
- 12)Are you using wind energy as Renewable energy ,for your energy needs in home or Agriculture?
a) Yes (b) partially (c) No
- 13)In production of Renewable energy like solar or wind,energy is helpful
(a) Decrease the pollution (b) Increase pollution (c) None
- 14)Do you know the develop of Renewable energy sources in India is helpful Indian economy ?
(a) very much (b) may be (c) none
- 15) SAVE ENERGY,-SAVE MONEY.- SAVE INDIA--Concept are you agree
(a) yes (b) No (c) partially agree.

BEST OF LUCK

Gr. Hymavathi

1. Renewable Energy

1.1 Introduction to Renewable Energy

The energy from a source that is not depleted when used is called as Renewable Energy. Renewable energy is the energy produced from sources like the sun and wind that are naturally replenished and do not run out. Some examples of renewable energy sources are solar energy, wind energy, hydropower, geothermal energy, and biomass energy. Renewable energy can be used for electricity generation, space, water heating, cooling and transportation. Renewable energy comes from sources that are constantly and naturally renewed and hence they are named as Renewable Energy Sources such as wind power and solar energy. Renewable energy is also often called sustainable energy. Renewable energy sources are the opposite of fossil fuels, like coal and gas which are finite energy sources. Renewable energy is often referred to as “clean energy” or “green power” since it comes from natural sources or processes that are constantly replenished and it doesn't pollute the air or the water.

1.2 Development of Renewable Energy

Although renewable energy is often seen as a solution for the future of our power needs, we have been harnessing the natural power of nature for centuries. Windmills and water wheels were used to power granaries, while the sun has been used to create fire for heat and light. However, humans became increasingly dependent on the use of fossil fuels including coal and natural gas. The widespread use of these types of energy has been shown to have had a detrimental impact on the planet, with increasing global temperatures, an increase in extreme weather events and the loss of natural habitats as a result. Recent advances in capture and storage, along with the global drive has created an expansion in renewable and green energy

production. These advances range from small-scale production, such as the placing of solar panels on a home, to large-scale facilities like offshore wind farms.

A study of nations around the world found that Germany uses the highest amount of renewable energy with 12.74%. This was followed by the UK (11.95%), Sweden (10.96%), Spain (10.17%), Italy (8.8%), Brazil (7.35%), Japan (5.3%), Turkey (5.25%), Australia (4.75%) and the USA (4.32%) all making up the top ten. Clearly, much work needs to be done to increase these usage rates in order to reach a completely renewable future, but this need is driving industry forward and creating opportunities in this sector.

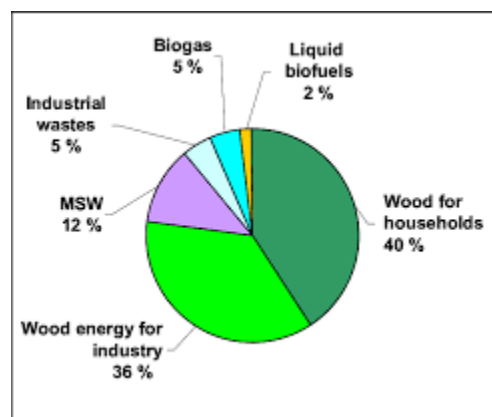


Fig. 1 Energy consumption from various sectors

1.3 Differences between Renewable and Non-Renewable Energy resources

Natural resources refer to the resources which are available without any actions of mankind such as sunlight, atmosphere, air, water, land, mines, vegetation and animal life. Natural resources are of two types, namely, renewable resources and non-renewable resources. Renewable resources are the natural resources that do not get depleted or exhausted even after their continuous consumption. These get replenished or replaced through natural processes during a finite amount of time. Examples are sunlight, wind etc. Non-renewable energy resources are the natural resources

that get depleted or exhausted with continuous human consumption and also do not get replenished or replaced. Examples are Mineral ores, Fossil fuels, Groundwater etc.

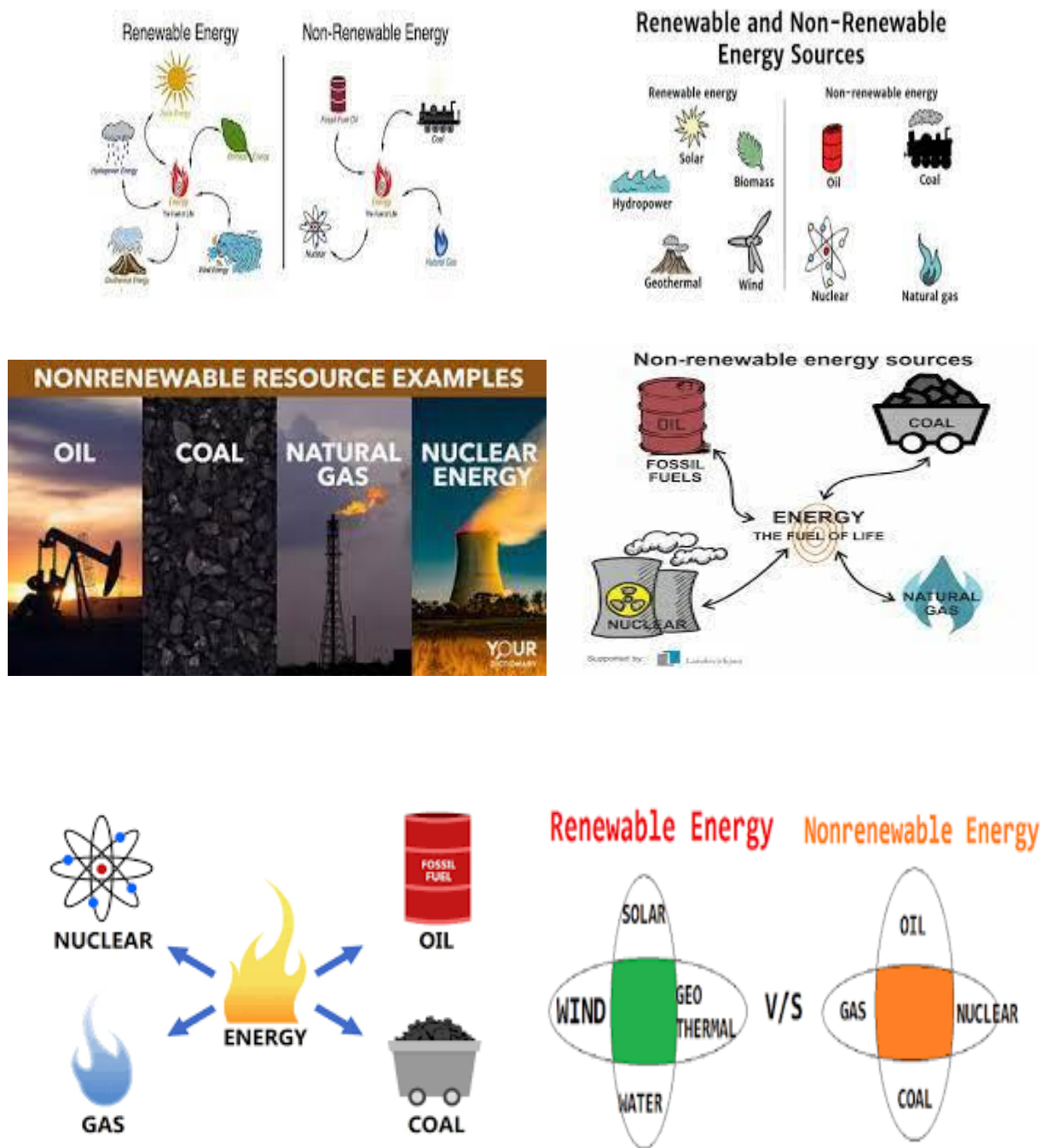


Fig 2. Examples of various Renewable and Non-Renewable Energy resources

1.4 Types of Renewable Energy

There are a range of renewable sources that have been developed, with each offering their own advantages and challenges depending on factors such as geographical location, requirements for use and even the time of year.

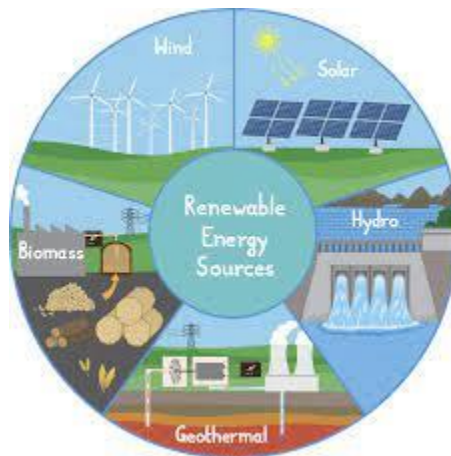


Fig 3. Various types Renewable Energy sources

1.4.1 Solar Energy

The potential for the sun to supply our power needs is huge, considering the fact that enough energy to meet the planet's power needs for an entire year reaches the earth from the sun in just one hour [1]. However, the challenge has always remained in how to harness and use this vast potential. We currently use solar energy to heat buildings, warm water and power our devices [2]. The power is collected using solar or photovoltaic (PV) cells made from silicon or other materials. These cells transform sunlight into electricity and can power anything from the smallest garden light to entire neighbourhoods. Roof top panels can provide power to a home, while community projects and solar farms that use mirrors to concentrate the sunlight can create much larger supplies [3]. Solar farms can also be created in bodies of water called 'floatovoltaics' these provide another option for locating solar panels. As well as being

renewable, solar powered energy systems are also clean energy sources, since they don't produce air pollutants or greenhouse gases. If the panels are responsibly sited and manufactured they can also count as green energy as they don't have an adverse environmental impact [4].



Fig. 4. Solar Power generation

1.4.2 Wind Energy

Wind energy works much like old-fashioned windmills did, by using the power of the wind to turn a blade [5]. Where the motion of these blades would once cause millstones to grind together to make flour, today's turbines power a generator, which produces electricity [6].

When wind turbines are sited on land they need to be placed in areas with high winds, such as hill tops or open fields and plains. Offshore wind power has been developing for decades with wind farms providing a good solution for energy generation while avoiding many of the complaints around them being unsightly or noisy on land [7]. Of course, offshore use has its own drawbacks due to the aggressive environments the turbines need to operate in [8].



Fig. 5. Wind Power generation

1.4.3 Hydroelectric Energy

Hydroelectric power works in a similar manner to wind power in that it is used to spin a generator's turbine blades to create electricity [9]. Hydro power uses fast moving water in rivers or from waterfalls to spin the turbine blades and is widely used in some countries. It is currently the largest renewable energy source in the United States, although wind energy is fast closing the gap [10]. Hydroelectric dams are a renewable energy source, but these are not necessarily green energy sources. Many of the larger 'mega-dams' divert natural water sources, which creates a negative impact for animal and human populations due to restricted access to the water source [11]. However, if carefully managed, smaller hydroelectric power plants (under 40 megawatts) do not have such a catastrophic effects on the local environment as the divert just a fraction of the water flow [12].

1.4.4 Biomass Energy

Biomass energy uses organic material from plants and animals including crops, trees and waste wood. This biomass is burned to create heat which powers a steam turbine and generates electricity [13]. While biomass can be renewable if it is sustainably sourced, there are many instances where this is neither green nor clean energy [14]. Studies have shown that biomass from forests can produce higher carbon emissions than fossil fuels, while also have an adverse impact on biodiversity [15]. Despite this, some forms of biomass do offer a low-carbon option given the correct circumstances. Sawdust and wood chippings from sawmills, for example, can be used for biomass energy where it would normally decompose and release higher levels of carbon into the atmosphere [16].

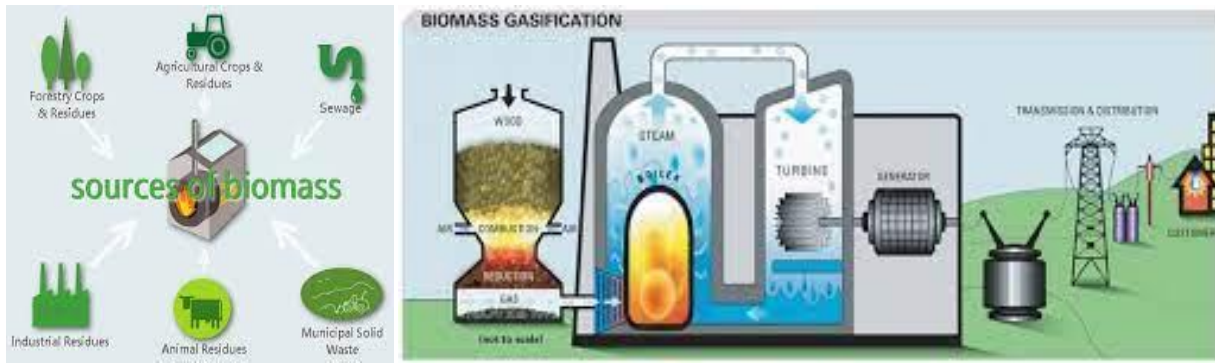


Fig. 6. Sources of Biomass and Biomass gasification Plant

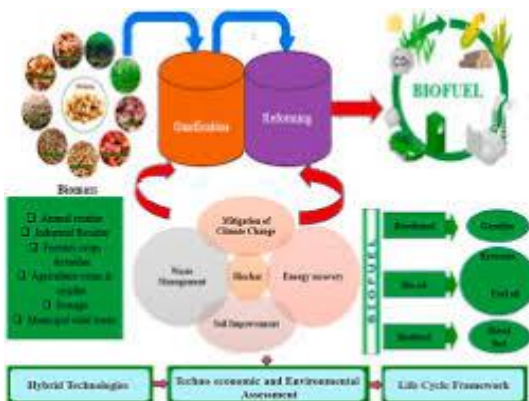


Fig. 7. Biomass & Biofuel generation

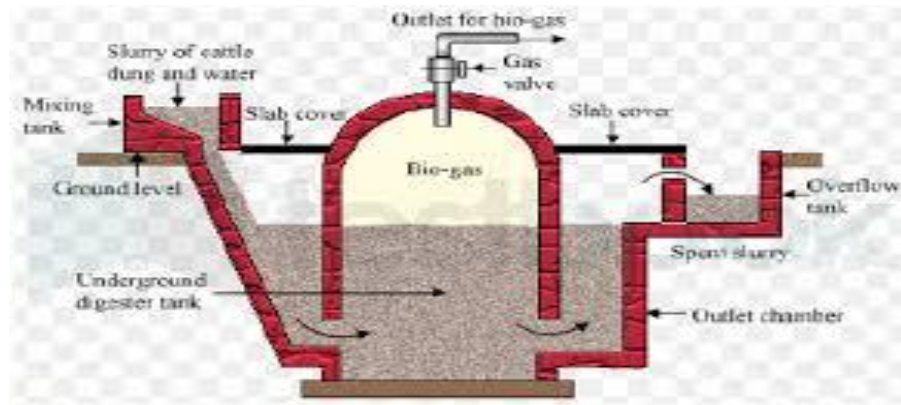


Fig. 8. Bio-gas generation Plant

1.4.5 Geothermal Energy

Geothermal energy uses the heat trapped in the Earth's core which is created by the slow decay of radioactive particles in rocks at the centre of the planet. By drilling wells, we are able to bring highly heated water to the surface which can be used as a hydrothermal resource to turn turbines and create electricity. This renewable resource can be made greener by pumping the steam and hot water back into the earth, thereby lowering emissions. The availability of geothermal energy is closely tied to geographical location, with places such as Iceland having an easily reached, ready supply of geothermal resources.

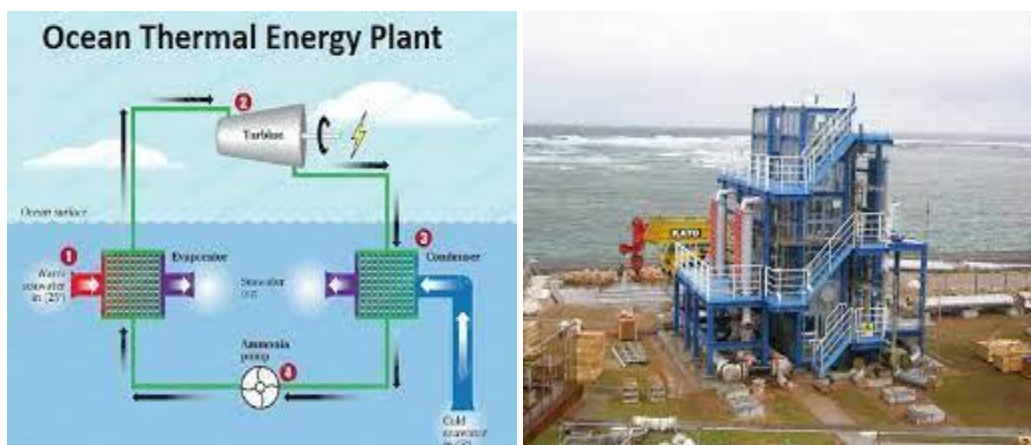


Fig. 9. Model of OTEC Plant and OTEC Plant at Kume Island

1.4.6 Tidal Power

Tidal power offers a renewable power supply option, since the tide is ruled by the constant gravitational pull of the moon [17]. The power that can be generated by the tide may not be constant, but it is reliable, making this relatively new resource an attractive option for many. However, care needs to be taken with regard to the environmental impact of tidal power, as tidal barrages and other dam-like structures can harm wildlife [18].

2. Importance of Renewable energy over Non-Renewable energy

Renewable energy offers a range of benefits including offering a freely available source of energy generation. As the sector grows there has also been a surge in job creation to develop and install the renewable energy solutions of tomorrow. Renewable sources also offer greater energy access in developing nations and can reduce energy bills too.

Of course, one of the largest benefits of renewable energy is that much of it also counts as green and clean energy. This has created a growth in renewable energy, with wind and solar being particularly prevalent. However, these green benefits are not the sole preserve of renewable energy sources. Nuclear power is also a zero-carbon energy source, since it generates or emits very low levels of CO₂.

Renewable energy is important as it has the potential to provide a ready supply of power without using natural resources. There is also a lower risk of environmental problems like fuel spills and minimal issues with emissions, while also reducing the need for imported fuels. With reliable supplies and fuel diversification, renewable energy could meet our power needs for years to come.

The effectiveness of renewable energy depends upon the resource being used. Some renewable sources are more readily available and effective than others, while some, such as

geothermal are of great use in some locations and not in others due to accessibility. However, despite these challenges, renewable energy has the potential to reduce electricity sector emissions by around 80%.

3. Objectives of the Present work

Keeping in view of the heavy demand of the usage of several non-renewable energy sources like Coal, Petroleum products, Fossil fuels, LPG for both domestic purpose and in transportation etc in our day to day life, consciousness should be promoted on the available sources and rate of consumption of these sources. Also, the disadvantages on losing these sources should be highlighted. The future generations will be affected after a few decades if the consumption of these non-renewable sources continues at a high rate in comparison to their production rate.

The main objective of the present work is to bring awareness in the public about the usage of non-renewable energy sources, the situation of the future generations if the consumption of energy sources continues in this high rate. The knowledge about the renewable energy sources like solar energy, wind energy, hydroelectric energy, geothermal energy, tidal energy, biomass energy etc is to be communicated to the public on a large scale. The differences about the renewable and non-renewable energy sources are to be explained to the public in detail. The environmental effects due the heavy usage of fossil fuels, petroleum products, coal which leads to pollution, global warming and green house effect is to be discussed with the public elaborately.

4. Methodology

In order to bring about a change in the usage of non-renewable energy sources in the present society, we have thought of a plan to reach out to the public in several ways. The steps followed in active implementation of the Methodology by us in reaching the society is given below:

- Bringing awareness in the public about the concept of Renewable and Non-Renewable energy sources
- Explaining in detail about the differences between them
- Environmental effects leading to Pollution, Global Warming and Green House effect
- Disadvantages in using Non-Renewable energy sources
- Need for the use of Renewable energy sources
- Harm done to future generations on over usage of Non-Renewable energy sources

Keeping in view of this burning problem, a survey was done by us, the I B.Sc Students of Government Degree College, Jammalamadugu as part of our community service project under the 1st Internship programme 2022-2023 by visiting the stake holders of houses in and around the Jammalamadugu town. During our visit, we had the opportunity to meet the people belonging all social communities i.e., People from various social religious backgrounds. This survey was done in order to discuss and impart the knowledge of renewable energy sources. We, the students have visited both the villagers and the people in Jammalamadugu town as well. The data about their previous knowledge on renewable energy sources was collected in the form of a questionnaire. This survey went on for more than 3 months. Later, the collected data was analyzed statistically to give us interesting results.



Fig 10. Field Survey from the Stake Holders in and around Jammalamadugu town

5. Analysis of the Present Work

The analysis of the present work is one based on the data collected from all the stakeholders of the houses in and around Jammalamadugu town. The analysis of the work is done in several aspects. The data is collected as a survey from the people belonging several communities in the society. The analysis deals with their opinions and ideologies on the burning topic which is Renewable Energy. The survey started with the opinion on the present topic i.e., Renewable Energy. The survey on the present work brings about the awareness in the public about the usage of several non-renewable energy sources that affects the upcoming generations. The data collected in the survey was analyzed statistically.

Table 1. represents the data containing the statistical information about the data collected from the people from various social communities in and around Jammalamadugu town.

S.No	Category/ Community	Number of families visited
1	OC	16
2	OBC	16
3	SC	10
4	ST	08
5	TOTAL	50

Table 1. Community wise Data

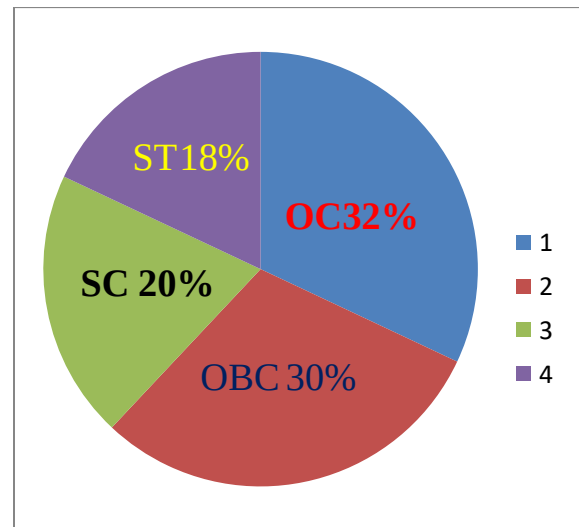


Fig 11. Piechart depicting the Community wise data

S.No	Energy	Good/ Awareness	No idea	Average
1	Solar Energy	92-95%	2%	6%
2	Wind Energy	70-75%	14%	16%
3	Hydroelectric Energy	60-64%	38%	2%
4	Biomass Energy	53-55%	17%	25%
5	Geothermal Energy	<25%	32%	43%
6	Tidal Energy	70-78%	8%	22%

Table 2. Shows the statistical data containing the details about the awareness of the stake holders on various Renewable Energy resources.

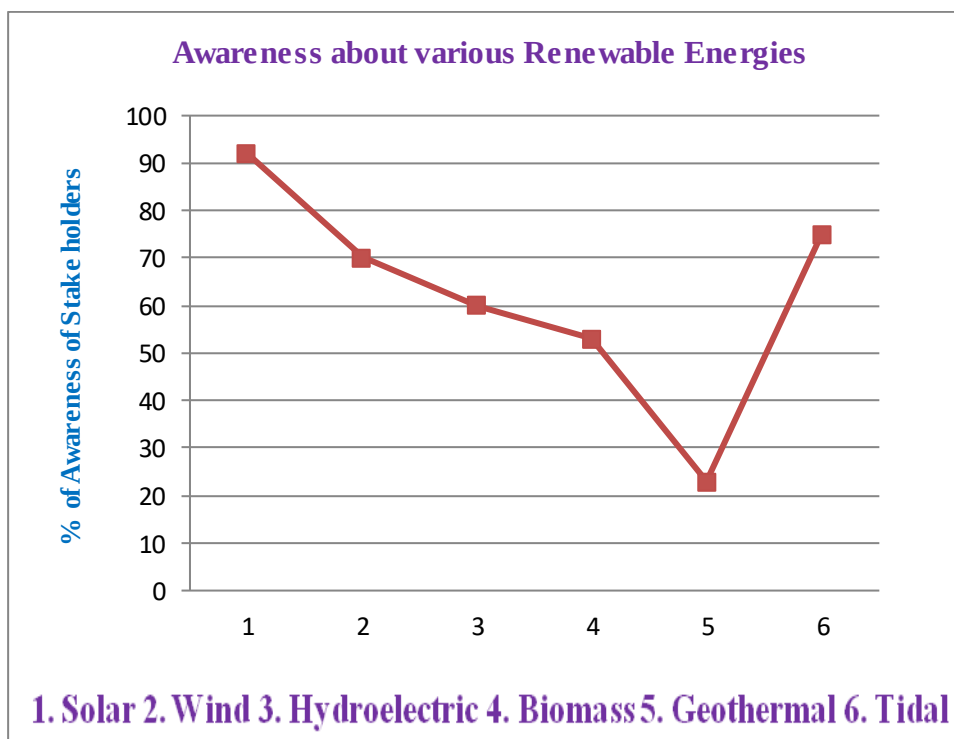


Fig 12. Depicts the % of awareness of stake holders on various Renewable Energies

6. Results and Discussions

Based on the analysis of the data collected during the survey, we come across the following results.

- About 85% of the stake holders use electricity for their home needs. Majority of the people living in the Urban areas consume more electricity for industrial, domestic purposes
- About 88% of the stake holders use Gas for their domestic purposes. Majority is utilized by the Urban.
- Only 30% people have a partial knowledge about Renewable Energy Sources, the rest are unaware of the resources. It is found that about 55% people have a better knowledge about Renewable Energy.
- Although 60-65% people have an clear idea about Renewable and Non-Renewable Energy Resources, due to lack of awareness they are depending on non-renewable sources of energy for their purposes
- About 95% people have a better knowledge on Solar Energy, but due to high economy and huge area occupancy they are less preferred. Although it is a onetime investment and low maintenance the people are seeking financial help from the Government towards subsidy for the implantation of solar panels for household, industrial and other institutional purposes.
- The idea of wind energy on the other hand is very well known to about 75% of the people as we observe wind panels in the hilly areas around Jammalamadugu near Gandikota and in the entire district as well. By suitable maintenance the rate of energy production may be enhanced.

- The idea of hydroelectric energy is not known to about 60% of the people. The people visiting the reservoirs can only have an idea on this type of energy resource as this is an electricity producing mechanism from water.
- The idea of Biomass is a well known technique in the past. The people in the rural areas about 55% know this type of technique. Majority of the people in the rural areas rely on this technique.
- Very few people less than 25% have an idea on Geothermal Energy as we find very less industries in our state utilizing this technique.
- The concept of Biofuels is also known to people in less number i.e about 30% people, this may also be due to unavailability of industries to produce Biofuels.
- The people living near reservoirs/coastal areas will have an idea about Tidal Power generation. In the survey it is found that less than 20% people only have an idea on this technology. The concept of OTEC is also known only to these people. We rarely find this instrumentation in our entire state.

8. Summary / Conclusions

Although the implantation of a solar energy kit is a onetime investment and low maintenance the people are seeking financial help from the Government towards subsidy for the implantation of solar panels for household, industrial and other institutional purposes. The suitable maintenance of a wind energy panel, the rate of energy production may be enhanced. Renewable energy looks set to be a large part of the future energy mix, along with other clean sources such as nuclear power. The drive towards a greener future for power production is promoting a rise in job creation in renewable power industries such as solar and wind. This trend looks set to continue as governments strive to reach net zero. The knowledge about the renewable energy sources like solar energy, wind energy, hydroelectric energy, geothermal energy, tidal energy, biomass energy etc is to be communicated to the public on a large scale. The differences about the renewable and non-renewable energy sources are also to be explained to the public in detail. The environmental effects due the heavy usage of fossil fuels, petroleum products, coal which leads to pollution, global warming and green house effect is to be discussed with the public elaborately.

9. Suggestions for future work

This work which is limited to a certain region of a town in Jammalamadugu can further be extended to an Assembly Constituency, District level or State as a whole as well. The advantages of this idea of Renewable Energy and its importance to the community can very well be extended to other burning problems in the society in our day today life also. Awareness to the public about the major issues can also be interacted and discussed with the public in the same methodology as it was initiated. A few more interesting results can be obtained in a similar manner through the adopted methodology.

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