ENERGY FLOW STUDY OF EXISTING 2KW SOLAR POWER PLANT ALONG WITH REDUCING WIRE TO ENHANCE EFFICIENCY

Kuldeep Lanjiwar, Sachin Baraskar, Sanjay Kalraiya, G.R.Selokar

Research Scholar, Mechanical Engineering, SSSUTMS, M.P, INDIA

Assistant Professor, Mechanical Engineering, SSSUTMS, M.P, INDIA

Professor, Mechanical Engineering, SSSUTMS, M.P, INDIA

Professor, Mechanical Engineering, SSSUTMS, M.P. INDIA

ABSTRACT

Solar energy has experienced phenomenal growth in recent years due to both technological improvements resulting in cost reductions and government policies supportive of renewable energy development and utilization.

The Energy efficiency is achieved when energy intensity in a specific product, process or area of production or consumption is reduced without affecting output, consumption or comfort levels. Promotion of energy efficiency will contribute to energy conservation and therefore integral part of energy conservation promotional policies. It provides additional economic value by preserving the resource base and reducing pollution.

The outcome of learning (during 25thto 30thJuly,2019) in "NATIONAL WORKSHOP CUM INDUSTRIAL TRAINING PROGRAMME ON SOLAR AND OTHER RENEWABLE ENERGY SOURCES" proposes following:

The Energy Efficiency is achieved when energy intensity in a specific product, process or area of production or consumption is reduced without affecting output, consumption or comfort levels. Promotion of energy efficiency will contribute to energy conservation and is therefore integral part of energy conservation promotional policies. Energy Audit is the key to a systematic approach for decision making in the area of Energy Management. It attempts to balance the total energy inputs with its use, and serves to identify all the energy streams in a facility. It quantifies energy usage according to its discrete functions.

Keyword *:- Solar power plant, Training program, Solar Photovoltaic, Efficiency.*

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1. INTRODUCTION

India is a country where, world's 17.74% of population lives and as we growing with fast speed, we consuming more and more energy and our index of consumption getting height too. In india, there is a huge difference in demand and supply of electricity and rising electricity prices have forced us to look for cheaper and cleaner alternative. Our objective can be meets by the use Renewable Energy.

In the 21st century where India aims to become a world super power, we still lack in the energy sector. We have only 0.3% of world's oil resources, only 0.7% of gas resources and about 6.5% resources.

All our conventional sources of energy are imported at very high unpredictable costs. Also important point to notice is that large coal share of our foreign exchange is being spent on importing energy resources. On broader perspective this also has impact on energy security of the country.

On the other hand we should look towards the renewable sources of energy such as solar which have such an abundant supply. Solar photovoltaic (PV) technology, with all the development in solar PV so far, it has become commercially viable option for electricity generation

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In order to ensure energy security and match the electricity supply and demand gap this is the perfect moment to acknowledge the fact that solar energy is the solution to our energy problems. Government's target of installation of 100,000 MW of solar power by 2022 is good indication of this. Solar PV technology is increasingly seen as viable option for our current and future energy supply.

1.1 SOLAR RADIATION

The solar irradiation data of a location is either measured or estimated by the well-established model. The equipment like pyranometer and pyrheliometer are used for measuring solar irradiation on the ground. NASA data also estimates the solar irradiation data based on space radiation measurements.

For Sehore, we have ground based solar radiation data recorded by Solar Energy Centre, MNRE. Large portion of the global energy supply is used for electricity generation and space heating, having the major portion derived from fossil fuels.

It is non-renewable resources and their combustion is harmful to the surroundings, during the manufacture of greenhouse gases, which effects the climate change and additional pollutants. Fossil fuel exhaustion along with pollutant emissions and global warming are important factors for sustainable and environmentally benign energy systems. These concerns have motivated efforts to reduce society's dependence on non-renewable assets, by dipping demand and substituting choice energy sources.

First of all efforts are focused on producing electricity with higher efficiency. Old power plants are more rapidly phased out and substituted by new, more resourceful plants. Added efficient use of energy not only reduces the consumption of electricity, but also lowers the consumption of non-renewable assets. Renewable energy assets are sought that are more environmentally benign and economic than conventional fossil fuels.

The basic aim of study of energy flow with cost analysis is to analyze various types of energy input in the system with their transformation in different phases before final conversion into the requisite output. The Renewable Energy lab is to enhance knowledge base of practical utilities of principles of engineering in conjunction with basic fundamental of science to understand its applicability in practical field.

The energy flow in system is mostly associated with flow of material, therefore, energy and material flow is required to be studied. The target of this study is to establish energy and material balance in the system to differentiate useful and wasteful consumption of scare resources of energy and material in various associated areas. Our strength is to utilize engineering principles to save energy with its full energy efficiency, without compromising our comfort.

The immediate aim of the Energy flow study is to focus on setting up an enabling environment for solar technology penetration in the country both at a centralized and decentralized level. The first we will focus on capturing of the low-hanging options in solar thermal; on promoting off-grid systems to serve populations without access to commercial energy and modest capacity addition in grid-based systems

.In the second phase, after taking into account the experience of the initial years, capacity will be aggressively ramped up to create conditions for up scaled and competitive solar energy penetration in the country.

1.2 Jawaharlal Nehru National Solar Mission

(Towards Building SOLAR INDIA)

The National Solar Mission is a major initiative of the Government of India and State Governments to promote ecologically sustainable growth while addressing India's energy security challenge. It will also constitute a major contribution by India to the global effort to meet the challenges of climate change.

In launching India's National Action Plan on Climate Change on June 30, 2008, the former Prime Minister of India, Dr. Manmohan Singh stated:

"Our vision is to make India's economic development energy-efficient. Over a period of time, we must pioneer a graduated shift from economic activity based on fossil fuels to one based on non-fossil fuels and from reliance on non-renewable and depleting sources of energy to renewable sources of energy. In this strategy, the sun occupies center-stage, as it should, being literally the original source of all energy. We will pool our scientific, technical and managerial talents, with sufficient financial resources, to develop solar energy as a source of abundant energy to power our economy and to transform the lives of our people. Our success in this endeavor will change the face of India. It would also enable India to help change the destinies of people around the world."

The National Action Plan on Climate Change also points out: "India is a tropical country, where sunshine is available for longer hours per day and in great intensity. Solar energy, therefore, has great potential as future energy source. It also has the advantage of permitting the decentralized distribution of energy, thereby empowering people at the grassroots level". Based on this vision a National Solar Mission is being launched under the brand name "Solar India"

1.2.1 Importance and relevance of solar energy for India

Solar is currently high on absolute costs compared to other sources of power such as coal. The objective of the Solar Mission is to create conditions, through rapid scale-up of capacity and technological innovation to drive down costs towards grid parity. The Mission anticipates achieving grid parity by 2022 and parity with coal-based thermal power by 2030, but recognizes that this cost trajectory will depend upon the scale of global deployment and technology development and transfer.

The cost projections vary – from 22% for every doubling of capacity to a reduction of only 60% with global deployment increasing 16 times the current level. The Mission recognizes that there are a number of off-grid solar applications particularly for meeting rural energy needs, which are already cost-effective and provides for their rapid expansion.

1.2.2 Scalability:

India is endowed with vast solar energy potential. About 5,000 trillion kWh per year energy is incident over India's land area with most parts receiving 4-7 kWh per sq. m per day. Hence both technology routes for conversion of solar radiation into heat and electricity, namely, solar thermal and solar photovoltaic, can effectively be harnessed providing huge scalability for solar in India.

Solar also provides the ability to generate power on a distributed basis and enables rapid capacity addition with short lead times. Off-grid decentralized and low-temperature applications will be advantageous from a rural electrification perspective and meeting other energy needs for power and heating and cooling in both rural and urban areas. The constraint on scalability will be the availability of space, since in all current applications, solar power is space intensive. In addition, without effective storage, solar power is characterized by a high degree of variability. In India, this would be particularly true in the monsoon season.

Environmental impact: Solar energy is environmentally friendly as it has zero emissions while generating electricity or heat Security of source: From an energy security perspective, solar is the most secure of all sources, since it is abundantly available. Theoretically, a small fraction of the total incident solar energy (if captured effectively) can meet the entire country's power requirements.

It is also clear that given the large proportion of poor and energy un-served population in the country, every effort needs to be made to exploit the relatively abundant sources of energy available to the country. While, today, domestic coal based power generation is the cheapest electricity source, future scenarios suggest that this could well change. Already, faced with crippling electricity shortages, price of electricity traded internally, touched 7 Rupees per unit for base loads and around 8.50 Rupees per unit during peak periods. The situation will also change, as the country moves towards imported coal to meet its energy demand.

The price of power will have to factor in the availability of coal in international markets and the cost of developing import infrastructure. It is also evident that as the cost of environmental degradation is factored into the mining of coal, as it must, the price of this raw material will increase. In the situation of energy shortages, the country is increasing the use of diesel-based electricity, which is both expensive – costs as high as Rs 15 per unit - and polluting. It is in this situation the solar imperative is both urgent and feasible to enable the country to meet long-term energy needs.

1.2.3 Objectives and Targets

The objective of the National Solar Mission is to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible.

The Mission will adopt a 3-phase approach, spanning the remaining period of the 11th Plan and first year of the 12th Plan (up to 2012- 13) as Phase 1, the remaining 4 years of the 12th Plan (2013-17) as Phase 2 and the 13th Plan (2017- 22) as Phase 3. At the end of each plan, and mid-term during the 12th and 13th Plans, there will be an evaluation of progress, review of capacity and targets for subsequent phases, based on emerging cost and technology trends, both domestic and global.

The aim would be to protect Government from subsidy exposure in case expected cost reduction does not materialize or is more rapid than expected. The immediate aim of the Mission is to focus on setting up an enabling environment for solar technology penetration in the country both at a centralized and decentralized level.

The first phase (up to 2019) will focus on capturing of the low-hanging options in solar thermal; on promoting off-grid systems to serve populations without access to commercial energy and modest capacity addition in grid-based systems

1.2.4 To achieve this, the Mission targets are

To ramp up capacity of grid-connected solar power generation to 1000 MW within three years – by 2019; an additional 3000 MW by 2020 through the mandatory use of the renewable purchase obligation by utilities backed with a preferential tariff. This capacity can be more than doubled – reaching 10,000MW installed power by 2021 or more, based on the enhanced and enabled international finance and technology transfer.

The ambitious target for 2022 of 20,000 MW or more, will be dependent on the 'learning' of the first two phases, which if successful, could lead to conditions of grid-competitive solar power. The transition could be appropriately up scaled, based on availability of international finance and technology.

To create favorable conditions for solar manufacturing capability, particularly solar thermal for indigenous production and market leadership.

To promote programmed for off grid applications, reaching 1000 MW by 2019 and 2000 MW by 2022.

To achieve 15 million sq. meters solar thermal collector area by 2019 and 20 million by 2022. To deploy 20 million solar lighting systems for rural areas by 2022.

Mission strategy (phase 1 and 2) the first phase will announce the broad policy frame work to achieve the objectives of the National Solar Mission by 2022. The policy announcement will create the necessary environment to attract industry and project developers to invest in research, domestic manufacturing and development of solar power generation and thus create the critical mass for a domestic solar industry.

The Mission will work closely with State Governments, Regulators, Power utilities and Local Self Government bodies to ensure that the activities and policy framework being laid out can be implemented effectively. Since some State Governments have already announced initiatives on solar, the Mission will draw up a suitable transition framework to enable an early and aggressive start-up

1.2.4.1 Utility connected applications: constructing the solar grid

The key driver for promoting solar power would be through a Renewable Purchase Obligation (RPO) mandated for power utilities, with a specific solar component. This will drive utility scale power generation, whether solar PV or solar thermal. The Solar Purchase Obligation will be gradually increased while the tariff fixed for solar power purchase will decline over time.

The off-grid opportunity - lighting homes of the power- deprived poor: A key opportunity for solar power lies in decentralized and off-grid applications. In remote and far-flung areas where grid penetration is neither feasible nor cost effective, solar energy applications are cost-effective. They ensure that people with no access, currently, to light and power, move directly to solar, leap-frogging the fossil fuel trajectory of growth. The key problem is to find the optimum financial strategy to pay for the high-end initial costs in these applications through appropriate Government support.

The market based and even micro-credit based schemes have achieved only limited penetration in this segment. The Government has promoted the use of decentralized applications through financial incentives and promotional schemes. While the Solar Mission has set a target of 1000 MW by 2019, which may appear small, but its reach will add up to bringing changes in millions of households. The strategy will be learn from and innovate on existing schemes to improve effectiveness.

The Mission plan is to provide solar lighting systems under the ongoing remote village electrification programed of MNRE to cover about 10,000 villages and hamlets. The use of solar lights for lighting purposes would be promoted in settlements without access to grid electricity and since most of these settlements are remote tribal settlements, 90% subsidy is provided. The subsidy and the demand so generated would be leveraged to achieve indigenization as well as lowering of prices through the scale effect.

For other villages which are connected to grid, solar lights would be promoted through market mode by enabling banks to offer low cost credit. Set up standalone rural solar power plants in special category States and remote and difficult areas such as Lakshadweep, Andaman & Nicobar Islands, Ladakh region of J&K. Border areas would also be included.

The Promotion of other off grid solar applications would also be encouraged. This would include hybrid systems to meet power, heating and cooling energy requirements currently being met by use of diesel and other fossil fuels. These devices would still require interventions to bring down costs but the key challenge would be to provide an enabling framework and support for entrepreneurs to develop markets.

The Solar Energy to power computers to assist learning in schools and hostels, Management Information System (MIS) to assist better management of forests in MP, powering milk chilling plants in Gujarat, empowering women Self Help Groups (SHGs) involved in Tussar reeling in Jharkhand, cold chain management for Primary Health Centers (PHCs) are some examples of new areas, being tried successfully in the country. The Mission would consider up to 30 per cent capital subsidy (which would progressively decline over time) for promoting such innovative applications of solar energy and would structure a non-distorting framework to support entrepreneurship, up-scaling and innovation.

In order to create a sustained interest within the banking community, it is proposed to provide a soft re-finance facility through Indian Renewable Energy Development Agency (IREDA) for which Government will provide budgetary support. IREDA would in turn provide refinance to NBFCs & banks with the condition that it is on-lend to the consumer at rates of interest not more than 5 per cent.

The Mission would provide an annual tranche for the purpose which would be used for refinance operations for a period of ten years at the end of which the funds shall stand transferred to IREDA as capital and revenue grants for on-lending to future renewable energy projects.

1.2.5 Manufacturing capabilities

innovate, expand and disseminate:

Currently, the bulk of India's Solar PV industry is dependent on imports of critical raw materials and components – including silicon wafers. Transforming India into a solar energy hub would include a leadership role in low-cost, high quality solar manufacturing, including balance of system components. Proactive implementation of Special Incentive Package (SIPs) policy, to promote PV manufacturing plants, including domestic manufacture of silicon material, would be necessary.

Indigenous manufacturing of low temperature solar collectors is already available; however, manufacturing capacities for advanced solar collectors for low temperature and concentrating solar collectors and their components for medium and high temperature applications need to be built. An incentive package, similar to SIPS, could be considered for setting up manufacturing plants for solar thermal systems/ devices and components.

The SME sector forms the backbone for manufacture of various components and systems for solar systems. It would be supported through soft loans for expansion of facilities, technology up gradation and working capital. IREDA would provide this support through refinance operations.

It should be ensured that transfer of technology is built into Government and private procurement from foreign sources.

1.2.6 R&D for Solar India:

Creating conditions for research and application

A major R&D initiative to focus:
Firstly, on improvement of efficiencies in existing materials, devices and applications and on reducing costs of balance of systems, establishing new applications by addressing issues related to integration and optimization;

Secondly, on developing cost-effective storage technologies which would address both variability and storage constraints, and on targeting space-intensity through the use of better concentrators, application of Nano-technology and use of better and improved materials.

The Mission will be technology neutral, allowing technological innovation and market conditions to determine technology winners. A Solar Research Council will be set up to oversee the strategy, taking into account ongoing projects, availability of research capabilities and resources and possibilities of international collaboration.

An ambitious human resource development programed, across the skill-chain, will be established to support an expanding and large-scale solar energy programed, both for applied and R&D sectors. In Phase I, at least 1000 young scientists and engineers would be incentivized to get trained on different solar energy technologies as a part of the Mission's long-term R&D and HRD plan.

The Pilot demonstration projects would be closely aligned with the Mission's R & D priorities and designed to promote technology development and cost reduction. The Mission, therefore, envisages the setting up of the following demonstration projects in Phase I, in addition to those already initiated by MNRE and those, which may be set up by corporate investors:

(1) 50-100 MW Solar thermal plant with 4-6 hours' storage (which can meet both morning and evening peak loads and double plant load factor up to 40%).

(2) A 100-MW capacity parabolic trough technology based solar thermal plant.

(3) A 100-150 MW Solar hybrid plant with coal, gas or bio-mass to address variability and space-constraints.

(4) 20-50 MW solar plants with/without storage, based on central receiver technology with molten salt/steam as the working fluid and other emerging technologies.

(5) Grid-connected rooftops PV systems on selected government buildings and installations, with net metering.

The configurations and capacities as mentioned above are indicative and would be firmed up after consultations with various stake holders. Bidding process will be adopted to set up solar power demonstration plants which would help in better price discovery for determining tariff for solar power. It will be ensured that indigenous content is maximized. The bid documents will also include a technology transfer clause. It is expected that these plants will be commissioned in the 12th plan period.

The Mission will encourage rooftop solar PV and other small solar power plants, connected to LT/11 KV grid, to replace conventional power and diesel -based generators. It is envisaged that distribution utility will pay the tariff determined by the State Electricity Regulatory Commission for the metered electricity generated from such applications (whether consumed by the grid connected owner of the rooftop/ground mounted installation or fed into the grid).

Under the Solar Mission, a normative Generation Based Incentive will be payable to the utility and would be derived as the difference between the solar tariff determined by the Central Electricity Regulatory Commission for the concerned solar generation technology less an assumed base price of 5.50 Rupees/kWh with 3% annual escalation.

The Funds will be disbursed through Indian Renewable Energy Development Agency (IREDA), a PSU under MNRE. The distribution utilities will be entitled to account such electricity generated and consumed within their license areas for fulfillment of RPOs. The metering and billing arrangements between the utility and the rooftop PV operator, will be as per guidelines/regulations of the appropriate commission.

The State Governments would also be encouraged to promote and establish solar generation Parks with dedicated infrastructure for setting up utility scale plants to ensure ease of capacity creation. Fiscal incentives It is also recommended that custom duties and excise duties concessions/ exemptions be made available on specific capital equipment, critical materials, components and project.

1.2.7 Research and Development

This Mission will launch a major R&D programmed in Solar Energy, which will focus on improving efficiency in existing applications, reducing costs of Balance of Systems, testing hybrid co-generation and addressing constraints of variability, space-intensity and lack of convenient and cost-effective storage.

The R&D strategy would comprise dealing with five categories viz.

i) Basic research having long term perspective for the development of innovative and new materials, processes and applications,

ii) Applied research aimed at improvement of the existing processes, materials and the technology for enhanced performance, durability and cost competitiveness of the systems/ devices,

iii) Technology validation and demonstration projects aimed at field evaluation of different configurations including hybrids with conventional power systems for obtaining feedback on the performance, operability and costs,

iv) Development of R&D infrastructure in PPP mode, and

v) Support for incubation and startups

2. LITERATURE REVIEW

solar energy is now getting its value due to limitation of mineral and insufficient solid energy existence but there is already studies is done and many more are continues doing research for better and better result to make it more and more effective. In the field of solar power plant efficiency improvement following literature been done.

Ahmed Hossam Eldin, Mostafa Refaey and Abdelrahman Farghly [1], Egypt **First-generation** solar cells dominate the market with their low costs and the best commercially available efficiency. They are a relatively mature PV technology, with a wide range of well-established manufacturers. Although very significant cost reductions occurred in recent years, the costs of the basic materials are relatively high. It is not clear whether further cost reductions will be sufficient to achieve full economic competitiveness in the wholesale power generation market in areas with modest solar resources. **Second-generation** Thin-film PV technologies are attractive because of their low material and manufacturing costs, but this has to be balanced by lower efficiencies than those obtained from first-generation technologies. Thin-film technologies are less mature than first generation PV and still have a modest market share, except for utility-scale systems. They are struggling to compete with very low c-Si module prices and also face issues of durability, materials availability and materials toxicity (in the case of Cadmium). **Third-generation** technologies are yet to be commercialized at any scale. Concentrating PV has the potential to have the highest efficiency of any PV module, Other organic or hybrid organic/conventional (DSSC) PV They offer low efficiency, but also low cost and weight, and free-form shaping. Therefore, they could fill niche markets (e.g. mobile applications) where these features are required

Nilesh Patel, Deepali Sananse, Priyanka Bore[2] Solar radiation data is available from several sources including satellite simulations. The data collection and simulation is a complex procedure and can have inaccuracies varying from 3 to 20%. The most reliable data is ground measured with accurate instruments. The performance (Capacity utilization factor) CUF depends on several factors including the solar radiation, temperature, air velocity apart from the module type and quality, angle of tilt(or tracking), design parameters to avoid cable losses and efficiencies of inverters and transformers. There are some inherent losses which can be reduced through proper designing but not completely avoided. The modules show degradation in power output through years of operation. It is observed that quality modules is very important in determining the extent of degradation. The improvements in technology and quality assurance have reduced this degradation considerably. Several manufacturers are proposing extended arranties although with a safety of margins. Based on the results of past studies and trends, one can fairly assume degradation of maximum 0.5% per year from 3rdyear of deployment. This can also be compensated by addition of 5

KW of modules per year from 4th year to 24th year of operation requiring an expenditure of Rs.4 to 4.5 lakhs per year at current market rates.

3. METHODOLOGY

Step 1 - The first step is to decide on the voltage for your system: 12, 24, or 48 volts. The main issue is the wire size needed for the (usually) fairly long run to the Solar Panels. Simply stated, the higher the voltage, the smaller the wire size that is needed to carry the current. The formula P=E*I says that the wattage/power P is equal to the voltage E times the current I in a circuit. So, you can see that as the voltage goes up the current goes down since E*I always = P. (More details on formulas are available under Watt & Power). Less current means smaller (less expensive) wire. So, as a general rule, you would normally choose a higher system voltage. The only reason not to would be if you planned on using lots of 12 volts DC only equipment. Also, keep in mind that whatever system voltage you decide on 12, 24, or 48,all of your equipment must work on this voltage. If you choose 24 volts for example, your solar panels, charge controller, inverter, and battery bank will all need to be 24 volts. By playing with the numbers in the Wire Size Calculator you can get an idea of what voltage will be best for your system.

Step 2 - Next, enter the maximum amps/amperage that your solar panels will produce. This will be the rating of one panel times the number of panels in your array. If you put two 12 volt panels in series to increase the voltage to 24 volts, you would count the two panels as one. The same would be true if wiring two 24 volt panels to equal 48 volts. The reason for this is that in a series circuit the voltage increases, but the current or amperage stays the same. More details on this are available under Battery Wiring Diagrams which explains series and parallel wiring. For example: 10 solar panels rated at 5 amps at 12 volts. You want a 24 volt system so you wire 2 panels in series to make 24 volts. You do this 5 times. The 5 pairs will be wired in parallel where the current adds to give you 5 sets times 5 amps per set equals 25 amps. Enter the 25 as the maximum amps your wires need to carry.

Step 3 - This is the distance in feet from your solar panels to the charge controller and battery bank location. Even though you will actually be running 2 wires, one negative & one positive, do NOT double the distance. The Wire Size Calculator assumes this and does it for you in the calculation.

Step 4 - The loss you will get in the transmission of the electrical power from your solar panels to your equipment location is due to the resistance of the wire. This cannot be avoided. A common practice is to use 3, 4, & 5 percent figures for 12, 24, and 48 volt systems respectively. I like the 3 percent choice for all systems, but even 5 percent is not too bad. The Wire Size Calculators' answers are based on copper wire using the standard AWG (American Wire Gauge) sizes. Also note that 00, 000, and 0000 gauges (generally referred to as 2/0, 3/0 and 4/0 are progressively larger in size and are represented in the Wire Size Calculator as -1, -2, and -3. If you enter numbers that would result in sizes larger than -3 (pretty darn big), you will get an error message to that effect. In this case, the best response would be to increase system voltage (resulting in less current required) or/and increase the percent of loss.

4. CONCLUSION

Solar Photovoltaic power plants is play an important role in the overall energy supply in college and energy requirement in SOE for entire year and now improvement in solar will be audited in next year but now we are able to estimate the approximate data by optimization of plant after reduction of 20feet of wire which connect the solar power panel to inverter is reduced into half of its length to 10feet .The efficiency of solar increased 119% to previous 100% . By Simple installing the proposed 20 KW Solar PV Power Plant along with Wind Mill cogeneration Power Plant to generate electricity for entire 24 hours on each day of a year and attempt output reading with different input parameters with various ways of energy auditing along with Research for various Input Parameters of Photovoltaic Array and Wind Turbine Blades by utilizing simulation techniques for providing electricity for the entire college duration in the entire SOE with the help of self-electricity co-generation Power Plant and applies energy audited suggestions.

The Proposed scheme will provide Renewable Energy Lab in the Mechanical Department of SSSUTMS, which is most appropriate for the energy flow study in order to increase energy efficiency and help to differentiate wasteful and useful component of energy and needs basic equipment to measure temperature at various points, flue gas analysis, basic preliminary ways by intricately observing the energy utility bills to mitigate any unnecessary losses during last one year due to our negligence, as the time already with us to meet global challenges to search profit among the least important easily available resources

The extra benefit to the each Technocrats, Post Graduate Scholar, Research scholar and the Entrepreneur of the society to perform research work by utilizing even simulation technique on this Renewable Power Plant, i.e., the most appropriate energy utilization with energy efficiency and research in the Renewable Energy Field

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