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Solar Panel: A Sustainable Development Alternative for Industries

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Abstract**—** *The energy system worldwide is seeking alternatives based on non-renewable sources that impact on the environment, new measures are therefore essential, such as renewable sources, which generate less environmental impact implementation of solar panels is characterized by as an alternative to conventional energy systems and polluting as a means of generating clean energy renewable and also with the advantage of enabling production of energy at the place of consumption itself. The objective of this study is to show the benefits related to the deployment of solar panels as a contribution to its role in sustainable development in industries. Thus, the appropriate incentives for spreading the use of distributed solar energy distributed among the actors becomes a major strategy for the industrial sector. In addition, the spread of major environmental innovations and ecological can bring economic benefits by stimulating industries to become more efficient in this area promote significant changes in the environmental, economic and social fields.*

Keywords**— Solar Panel; Industries; Renewable Sources.**

I. INTRODUCTION

Industries, in the current scenario, show strong technological growth, This is happening at an ever-increasing pace, the trend in energy consumption is increasing, since electric power is necessary for the vast majority of industrial activities.

The implementation of renewable energy sources as well as of storage systems reduce the amount of energy produced at low cost which is not properly harnessed [1].

Sustainable Development has brought a new approach to the relationship between mankind and the environment, promoting technological progress developed in an industrial process with various environmental impacts, where many industries aim to improve processes in this area. This is the idea of developing educational work, and consequently progress to mitigate environmental impacts.

Brazil, undergoing technological changes seeking to optimize the country's economy and the production of energy generated presents positive projections in alternative technologies, as that obtained through solar incidence, for the purpose of generating electricity using a solar power generation system grid-connected photovoltaic [2].

The energy system worldwide has been searching for alternatives based on non-renewable sources that impact on the environment, therefore initiatives that promote the advancement of renewable sources with minimum environmental impact.

Thus, the implementation of solar panels is characterized as an alternative to conventional energy systems and pollutants as a clean energy generation mode, renewable and also with the advantage of enabling energy production at the place of consumption itself. Solar panels are therefore instruments that contribute to the generation of energy generating less impact and reducing excessive spending for environmental and social purposes.

This study aims to characterize the beneficial impacts related to the implementation of solar panels, as a direct contribution to sustainable development in industries.

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II. METODOLOGY

The methodology applied in this study was based on a bibliographic survey conducted for thematic related data collection in order to demonstrate the importance of installing solar panels, identifying its benefits, particularly with regard to mitigation of environmental and social impact and as an alternative source for industries.

Later, an explanation of the technology will be highlighted and the benefits for using solar panels, in addition to types of photovoltaic modules that can be deployed.

The study also provides a brief analysis of solar energy and the ability to improve and use this type of energy. In general, because we are situated in a high percentage area of solar irradiation, becomes the focus to understand on the subject, to enjoy and become one of the largest consumers and developers of renewable resource.

III. RESULTS AND DISCUSSION

Electric energy is fundamental to human beings, as an indispensable resource for everyday activities, resulting in comfort and even the development of new technologies and the advancement of mankind; but that overload, directly linked to the demographic increase, also brought problems related to the depletion of resources used to produce such energy, as well as impacts on the environment, often irreversible.

The sun's energy be used through the photovoltaic effect to produce electricity, converting the sun's energy into electrical energy, thus generating a clean and renewable energy source that causes less impact on the environment [3]

The increase in the number of people and technological development development have had a great need to produce electricity to meet demand.

Currently, there are several sources that can be used, either by hydroelectric plants, nuclear power stations and even by coal [4], however, some of them have contributed to the increase of pollution in the world and with it great impact on the environment and on different resources. This requires incentives for the use of clean and safer sources, as is the case with solar energy, with solar photovoltaic systems, reliable and a possible alternative energy source and sustainable in industries, in their productive environment.

In the industrial sector there is the juxtaposition of new technologies, because each project that reduces or minimizes should be studied and applied as a means of environmental benefit and also, economically, from the cost of the photovoltaic modules, reduction of taxes and the rising price of oil, which should be considered for the implementation of a project where solar energy is used as an alternative and advantageous source of energy [5].

The conversion of solar energy into electricity takes place directly, in a clean, silent process carried out at the place of consumption. This, combined with technological development, makes the production of electricity through photovoltaic generators and solar energy is a technical and economic reality that is widespread in the main industries.

The use of photovoltaic systems has several advantagesnot restricted to economic ones. In this power generation system, the consumer and also the producer of the energy, being most of the time in most cases, the sole owner is responsible for the whole process. Another advantage is that the energy source is free of charge and available for virtually infinite term (renewable energy source), since energy from the sun is available everywhere.

Limitation of energy supply in isolated locations is overcome, as it is, as said earlier, a resource available anywhere in the country. There is also the local generation, which contributes to environmental preservation, since the impacts are extremely low, i.e. clean energy [6].

With regard to the economy, the evolution of electricity production, by the solar energy boards, makes their installation, in the industrial environment and administrative, be practical and meet demand especially with regard to the use of equipment machinery, among others.

Currently, with the available technological applications, electric power generation from solar radiation is obtained by the photovoltaic effect. Thus,public policy actions are needed to exploit this energy source, considering the productive densification, generating a significant technological and clean dependence.

Seeking new alternatives, for the use of renewable energy, photovoltaic systems are in increasing use. With it, has been exploring new materials and conducting research for the advancement of photovoltaic [7].

Solar energy, on the other hand, does not need to be extracted, refined and neither transported to the place of generation, as it uses solar cells, which are responsible for generating energy [8]. This process is simplest, no emission of gaseous pollutants or noise with minimal need for maintenance.

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The relentless pursuit of development and of economic growth unquestionably entails unlimited and uninterrupted demand for electricity. The current world energy scenario shows signs of depletion of natural resources geared to energy generation. The increasing use of various equipment that demands electricity has two effects, being them, the increase in electricity consumption and the increase in the industrial production process. This development cycle, therefore, increases the emission of so-called greenhouse gases [9].

Growing environmental concern and global climate impacts has been generating a reflection on sustainable development around the world, committing to in-depth studies on alternative sources of renewable energy that can be incorporated into the brazilian electric matrix, mainly in industries.

In general, industries are quite intensive in energy consumption. In addition, the modern lifestyle itself is directly related to an increase in energy use [10].

The cost of implementing an isolated solar system may even drop sharply as its economic potential is to reduce electrical activity and the solar equipment has approximately 30 years of useful life value [11]. By aggregating taxes, environmental and social costs, photovoltaic solar energy will become economically competitive in the near future.

Solar panels, or modules, are the main components of the photovoltaic system energy generation. These are formed by a set of associated photovoltaic cells, electrically, in series and/or parallel, depending on the voltages and/or currents determined in design. All these modules are called photovoltaic generator and constitute the first part of the system, are responsible for the process of capturing solar irradiation and its transformation into electrical energy [11].

The industries are expanding significantly, affecting the world somehow; with this, the use of the solar source for electricity generation has as energy source. However, the energy not used in a satisfactory way. In this way, provide the appropriate incentives for the spread of solar energy use distributed among the actors becomes a major strategy for the industrial sector. In addition, the dissemination of major environmental and ecological innovations can bring economic benefits by stimulating brazilian industries to become more efficient in this area.

To understand the applications and benefits of a solar panel its production efficiency needs to be analysed. Efficiency is one of the characteristics of evaluating the quality of a photovoltaic module. However, it needs to be seen in a global context, considering the other variables involved, being defined by the relationship between the amount of electric power which is produced at the point of maximum power (W) and the amount of solar energy reaching the module ($W/m^2 \times m^2$) [13].

Industrial policy in a context of renewable energy policy, can generate relatively high costs, and there are still many obstacles to this condition. The question of value, shows the advantageous financing conditions, being a central element in the expansion of electricity generation mainly in large industries, given the broad and historic involvement of new public policies. Thus, in the absence of careful adaptation, the conditions for the financing of new renewable sources can have a strong impact on technological choice, considering other renewable sources.

IV. CONCLUSION

The impacts of energy use on the environment, its production and consumption, deserve a relevant analysis, either because of the huge environmental impacts caused energy used in industries and use of environmental resources.

The production of electricity by solar radiation conversion is a promising technology today, clean and renewable for electricity production, offering exemplary conditions for the use of this photovoltaic technology to reduce dependence on electric power from industries.

The deployment of solar panels helps to reduce gas emissions, and in Brazil, for example, could be used in most industries, for not using any fuel, where solar energy does not contribute to the price increase and problems in the recovery and transport of fuel or in the storage of radioactive.

There is an increasing need for the use of clean and renewable energy sources, a measure to reduce gas emissions, enabling an increase in the local energy matrix, which have proved capable of promoting significant changes in the social and environmental fields.

Therefore, the challenge is still to make available and prioritise resources to develop technologies to enable alternative energy sources in a timely manner so that industries can recover and there is no collapse between industrial growth and the availability of a clean environment.

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