

# Strategies for improve Energy sector in Coastal Andhra Pradesh with Renewable Energy Sources

<sup>1</sup>Akshay kumar. G, <sup>2</sup>Ganapavarapu Lova Raju, <sup>3</sup>Jettiboyina Anjaneyulu,

<sup>4</sup>Vantapati V V S D Prasanna, <sup>5</sup>N.Siva Nagendra.

<sup>1</sup>Asst Prof of Management, <sup>2</sup>Assistant Professor, <sup>3</sup>Associate Professor of Physics, <sup>4</sup> Asst Prof of Management, <sup>5</sup>Asst Professor.

<sup>1</sup>Department of S&H, <sup>2</sup>Department of EEE, <sup>3</sup> Department of S&H, <sup>4</sup> Department of S&H, <sup>5</sup>Department of EEE.

<sup>12345</sup>BVC Engineering college (Autonomous), Odalarevu, A.P, India.

**Abstract :** Energy is a kind of strength which works to do several activities. The Energy flows in different forms, such as mechanical, electrical, chemical, and nuclear energies. These energies can be converting from one component to another with the help of operating forces. The energy sector is a kind of production area that related to producing and supplying the energy. These industries are producing various types of energies, and participating as the major drivers for improvement of the country's and state's economy and also for industrial growth. Generally, the country's energy sectors development depends upon the contribution of states performances, by this reason Andhra Pradesh is a definite state in India may taking significant part in energy sector growth with the help of renewable and non-renewable energy sources. The non-renewable energy sources are providing great results in energy sectors but at the same time it generates side effects on the environment, for this reason, every country is focusing on renewable energy forms to produce environment-friendly energy named as green energy. The point of renewable energy Andhra Pradesh acts as one of the major players in the country economy. If Andhra Pradesh wants to develop renewable energy, this state has plenty of opportunities through coastlines. The coastlines are always having potential environment for producing energy. The pristine nature of the coastal environment drives various forms of coastal energies, and these climates are used to generate green energies. A perfect Energy production plan on the coastlines in Andhra Pradesh will improves the sustainable energy sectors in coastal Andhra Pradesh with renewable energy sources. The aim of this paper is to develop a frame work and guidelines to be addressed by decision-makers for coastal energy productions in Andhra Pradesh. Though, Andhra Pradesh is a successful energy producer in the country. Andhra Pradesh carries the second-longest coastline in the country. This phenomenon is used to make unique coastal energy by establishing various renewable energy plants.

**Index Terms -** Seashore wind energy, offshore wind energy, wave energy, tidal energy, ocean thermal energy, solar energy.

## I. Introduction:

A Coastal area is an Interface place between Land and Sea. Generally, these lands are near to lakes, Sea or Oceans. Naturally coastal areas are supporting for a large amount of Wind, Solar and Tidal energy productions. Andhra Pradesh is a land with the second-longest coastline of 974 kilometers in India, and also Andhra Pradesh is holding up nine coastal districts, those are Srikakulam, Vijayanagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore. This is an opportunity to generate marine energy by carrying different varieties of power-producing strategies in Coastal Andhra Pradesh by its fabulous landscapes. In Andhra Pradesh, each Coastal District was Carrying unique landscapes and these lands almost all worked to produce marine energy by using various Renewable energy Sources in every district.

## II. Present Wind and Solar power generation of Coastal Andhra.

Ministry of New and Renewable Energy (MNRE) has composed a scheme to establish a number of solar parks across several states in the country, each Solar Project is generally expected to generate above 500 MW. The System formulates to deliver economic support by the Government of India to create solar parks with an objective to promote the creation of infrastructure for setting up new solar power projects. This initiation leads to establish renewable energy projects in Andhra Pradesh.

Present Andhra Pradesh has been producing around Rs 60,000 crore, which takes part around the 10 percentage of India's green energy. Andhra Pradesh carrying 4,092 MW of Wind Power projects and also carrying 3,230 MW of Solar Power projects installed for energy generation as on 30-Oct-2019. It is a good sign of development of Andhra Pradesh Renewable energy.

### III. Strategies for improve Renewable Energy Sector in Coastal Andhra Pradesh.

Most of the coastal areas are having best renewable energy elements. This situation is happened by marine energy and Ocean-atmosphere. Generally, Marine energy and Ocean-atmosphere generates potential renewable energy sources namely solar energy form the sun heat and tidal energy, wave energy and also wind energy etc. Basically, these firms are taking high cost for establishing but can produce potential output.

Andhra Pradesh is having 974kilometers of marine line with nine coastal districts. It was a nature-driven opportunity to get chances for generating renewable energy projects to the state. To develop renewable energy in Andhra Pradesh we need to focus on installing the new energy plants like Wind, Solar, Tidal, Wave, Ocean thermal energy in all coastal districts of Andhra then we can improve the power range.

#### 3.1 Offshore and Seashore Wind Energy:

The Wind is the flow of air on large quantities, within the Earth atmosphere. The movement of air is too powerful and which can destroy anything with its force. In ancient times the humans are using this wind power to sail their boats on the ocean, but now in modern times we use the Vertical and Horizontal axis wind turbines for generate electricity by using the wind power. Various countries are utilizing this opportunity for establishing wind energy projects for getting better electricity results. Andhra Pradesh has also started wind energy projects in some areas in the state and getting the best result through those projects. But if this state wants to increase more energy through wind power it has high chances by taking the help of marine line and ocean-atmosphere. Because Andhra Pradesh is having a big coastline it can provide the seashore and offshore wind energies by installing wind projects. If Andhra Pradesh starts offshore wind energy projects which will give best result for energy production because of its ocean-atmosphere and here sea levels are supporting to produce offshore wind energy by using wind turbines. In the same point of view, Andhra Pradesh is having another opportunity to produce energy with seashore wind energy projects. Seashore wind energy means producing electricity by establishing wind energy plants in Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, Krishna and Guntur districts may deliver better and potential renewable energy. Because in these districts some of the districts are having Mountains near to the sea and some districts are having plain lands with good wind force. By these two wind project sources; this state can increase energy capacity.

#### 3.2 Wave Energy:

The waves are occurred by the progressing of wind across the water surface. The Collision between the air and water particles motives energy to switch from the wind to the water, this nature will help to create waves. In Modern Times these waves are used to produce energy by using its frictions, it may call as wave energy. Wave energy is produced by the activity of wind by sliding on the floor of the sea. When wave energy is knocking the seaboard it will generate some power and on that time using wave energy converter for restoring wave power into electricity. Wave energy is a healthy and renewable source of energy; this can be taken a high cost in production but can be provide a satisfactory source of energy in off-grid coastal areas. Andhra Pradesh is holding up a good ocean condition to produce wave energy within the limit, normally wave energy depends upon the size and pressure of the wave and also climatic conditions. In Andhra Pradesh wavelengths are varying depending upon the ocean-atmosphere but in Andhra Pradesh, some seashore districts possess a high wavelength and height and continue movements to produce wave energy those are Vizianagaram, Visakhapatnam. These districts sea line will helps to generate better and potential result for the wave power generation.

#### 3.3 Tidal Energy:

Tides are the fluctuations of sea levels resulted in joint reactions of the gravitational pressures exercised by the sun and moon, and also the cycle of the earth. Tidal Energy is resulted by the sun and moon's gravitational force on the ocean which influences to generate high and low tides. The high and low tides have a capacity to create tidal power in marine areas, and it is sufficient to ride the turbines to produce electricity. The major advantage of tidal energy is renewable energy. The tidal cycle happens in every 12 hours on the ocean due to the earth cycle. It is an opportunity to generate electricity. Tidal energy plants are taking very high cost and investments due to the high cost of construction and also having high tariffs but we can produce good output. To capture sufficient power from the tidal energy potentially, the height differences is must in between high tide and low tide. In Andhra Pradesh the costal districts have such capability to produce tidal energy, mainly Srikakulam, Visakhapatnam, East Godavari some places, Krishna, and Nellore districts will work to produce tidal energy due to the wave height. These coastal districts may develop economic result by installing tidal projects.

#### 3.4 Ocean Thermal Energy:

Ocean Thermal Energy is the sustainable energy, which can produce the high quantity of electricity. Ocean Thermal Energy produces electricity by using ocean temperature. Particularly this project works with the differences between hot surface of the ocean water and deep cold ocean water. These projects may usually function with pumping a large quantity of deep cold ocean water and hot surface water to run energy cycle and it works to produce electricity. These plants are having the capacity to generate power for the entire day. It was a clean renewable energy source with sustainable massive production levels of energy. This is the best opportunity for Andhra Pradesh to develop the renewable energy sector in coastal areas. In Andhra Pradesh, all coastal districts can work to generate this ocean thermal energy with its atmosphere and also these waters can delivers hot and cold temperatures. To establish these projects may take a

high amount of economy if Andhra Pradesh establishes these projects which can get the best economic result and generates massive electricity.

### 3.5 Solar Energy:

We are living in the giant solar system which usually runs under the gravitational bound with the Sun and Other planets on their own orbits. Sun is acting as the regulator for all the planets in milky galaxy for their rotation cycle. With the help of the Sun, entire planets in our solar system may get lighting and generating their own climates. Especially Sun generates tremendous heat to the planets. For us, it was an opportunity to produce energy by using the Sun heat to generate energy; this transformation can call as solar energy. To produce this energy we need to install solar panels, to transform solar heat into electricity. These ventures are taking the high cost but it is a sustainable form of green energy that helps to reduce pollution caused by non renewable energy plants. To produce solar energy we want dry lands with massive hot atmosphere. Generally, coastal areas are having the temperature to generate solar electricity, because these coastal areas are carrying dry lands. Andhra Pradesh is one of the major solar energy producers in the country and also this state was taking several steps to upgrade this form of energy by installing solar projects in different areas but this state wants to improvise more energy they need to establish solar projects in coastal areas, which can be give massive growth to the solar industries in the state. Particularly Nellore, Guntur, Prakasam, East Godavari, West Godavari, Krishna, and Srikakulam districts are having hot Coastal line this was the best opportunity to establish the solar plants to generate favorable economical result to the state.

### VI. Conclusion:

Every Country was aiming to improve the renewable power plants for providing better energy during the peak periods. To generate renewable energy, coastal areas are the best sites to the producers. These lands are having a unique atmosphere for creating green energy. In India, the southern state Andhra Pradesh is one of the key performers for renewable energy generation. Generally, every state energy development only happens when it utilizing all the natural opportunities what it has. Andhra Pradesh was carrying the longest coastline with the valuable environmental conditions to generate costal energy. If this state concentrating on adequate renewable energy projects in the various costal districts, defiantly this state can get sustainable development in the energy sector.

### REFERENCES:

- [1] <https://nredcap.in/Default.aspx> by new renewable energy development corporation of Andhra Pradesh ltd.,
- [2] [https://en.wikipedia.org/wiki/Power\\_sector\\_of\\_Andhra\\_Pradesh](https://en.wikipedia.org/wiki/Power_sector_of_Andhra_Pradesh)
- [3] “Ray of hope as Andhra Pradesh starts clearing renewable dues this week”, by kaavya chandrasekaran, Arijit Barman, ET Bureau, on The Economic Times, Jan 04, 2020.
- [4] Solar Energy: Principles of Thermal Collection and Storage, S. P. Sukhatme and J. K. Nayak, TMH, New Delhi, 3rd Edition.
- [5] Renewable Energy Resources, John Twidell and Tony Weir, Taylor and Francis second edition, 2013.
- [6] Energy Science: Principles, Technologies and Impacts, John Andrews and Nick Jelly, Oxford University Press.
- [7] Renewable Energy- Edited by Godfrey Boyle- Oxford University. Press,3rd edition, 2013.