

# What India must do to augment energy



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A country's growth and prosperity depend on its level and extent of energy. The energy required for a country to operate and grow means electricity and fuel used in factories, transport, agriculture and households every day. The 'utility of energy' meant for sustained development of a country must be made available easily to the people and at the same time, it should not be detrimental to the environment. Besides, it must be affordable to the people. Using these metrics, the question arises whether India's use of energy is right or not.

## **Energy and challenges**

An Indian's use of energy is just one-third compared to that of a global man's use. Same is the case with electricity. This is a challenge to growth. In order for us to grow so as to be on a par with countries well developed in terms of society, industry and

economy, we must tone up infrastructure for the renewable energy source, that is, solar power.

Power is measured by the unit of kilowatt hour. A kilowatt hour means 1,000-watt power used in an hour. In the U.S., one of the developed countries, an average individual use of power is 17,000 kilowatt hours while the figure in India is 1,700 kilowatt hours. The average individual use is measured by dividing by the population figure the sum total of a country's annual use of power. If the use of energy in India, a developing country, goes up to the level of the developed countries, then India's energy needs will go up tenfold. In that case, our country will have to face two major challenges.

First is the challenge of energy security. The energy we get must be long-standing, clean and affordable and accessible to all. But the indigenous production of coal and crude oil in our country is not so sufficient as to meet even today's needs. We have to depend on heavy imports from foreign countries. Moreover, only 79 per cent of people get the cooking gas with the remaining 21 per cent people depending on trees and dung cakes for fuel.

Secondly when the use of energy goes up, it will entail ill-effects of climate change which will damage the country. By way of controlling this harmful consequence, according to the Paris Agreement, the average global temperature must be allowed to increase only to 2 degree Celsius from the level that prevailed before the Industrial Age (1750 CE) and by sustained efforts, it must be controlled beneath 1.5 degree Celsius. For achieving the goals, carbon-dioxide, one of the greenhouse gases, must be controlled.

### **Air quality**

Way back in 1750 CE, the level of carbon dioxide was 280 PPM (Parts per Million). The figure went up to 367 PPM in 1999 and 417 PPM in 2023. To control this trend, emissions of carbon dioxide must become net zero by 2050. That is to say, emissions by factories and vehicles and from other human activities must be at the same level as that of absorption by trees and other methods. To attain these goals, the use of coal and crude oil, which have higher carbon compounds, must be curtailed and renewable energy sources such as sunlight, wind mills and bio-fuels must be tapped and power produced and used to a large extent. Thus the first challenge of energy security can be tackled. India has set a target of 500 gigawatt power production (1,000 kilowatt is a megawatt and 1,000 megawatt is a gigawatt).

Today India's production capacity in renewable energies is 167 gigawatt, of which solar power accounts for a major chunk at 63 gigawatt. If we concentrate on augmenting this production at the current rate, India's power needs can be fully met with sunlight available abundantly. The National Solar Energy Federation of India has estimated the available energy in the country at 748 gigawatt. But do we have enough infrastructure to tap into it?

### **For India to shine...**

If we analyse the value chain of solar power, we will understand where we stand in the framework. Solar panel is an important component for tapping sunlight. Solar panel is a device that converts sunlight into electricity using photovoltaic cells. To produce these cells, a very thin ingot wafer, which is made from poly-silicon, is used. This poly-silicon is a main ingredient made from the sand called silicon. Of the poly-silicon used by the world today, 95 per cent is made in China from which all countries including India import it.

Though India's solar panel production capacity stands at 38 gigawatt, only 19 gigawatt is being produced at present. This is because the infrastructure for poly-silicon production, which requires high technology and huge investment, is not available indigenously. Meanwhile, it is comforting to know that efforts are underway to set up poly-silicon manufacturing plants by 2026, which can generate 38 gigawatt of power.

If the pure sand called poly-silicon, which is produced from silica sand, is manufactured in India, it will meet our energy needs. Accordingly, the production of poly-silicon should be augmented. This should be followed by an increased productivity of cells and panels. Ultimately India will glitter and rise towards sustainable progress thanks to solar power.

**Translated by V. Mariappan.**