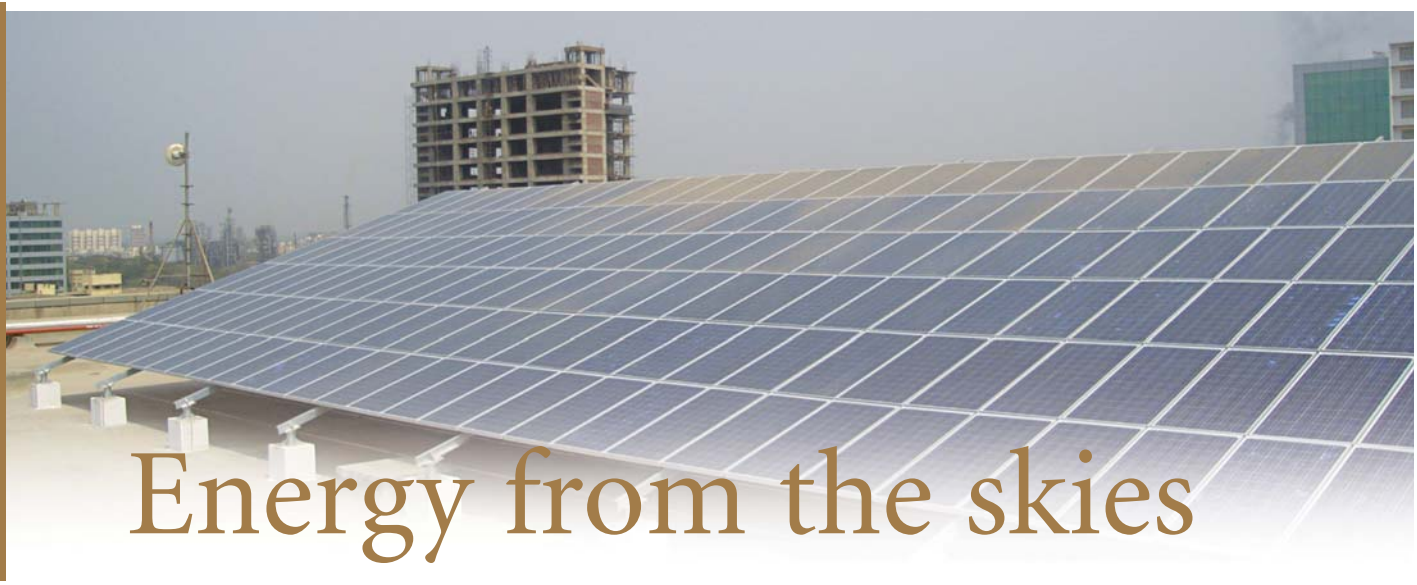


Energy from the skies

Highlighting India's shortcomings in power generation and supply, **K Subramanya** recommends a greater emphasis on use of renewable resources and solutions that use the natural energy of the sun

With a population of 1.16 billion and increasing every second, India is set to overtake China and become the most populated country in the world by 2035. Its economy grew at 9 per cent per annum over the last three years, and despite the economic slowdown in the current year, the economy is set to grow at 7 per cent.

There is every chance that India will maintain that kind of growth, along with growth in infrastructure. Unfortunately, what could prove to be the Achilles' heel in the India story is energy, the one crosscutting element that's necessary not just for industries, transport and irrigation but also for a minimum level of comfortable human existence.

We are scripting an India story that's uncomfortably short on power supply. Power cuts and load-shedding are a part and parcel of urban life in any part of the country and we have the unfortunate story of more than 400 million people who till date do not have an electric connection in their home.

Ground realities

We need to urgently bridge the deficit of 12 per cent (with a peak as high as 16.7 per cent) between demand and supply of power. And we need to connect all those 400 million people to an electric power supply. This means we need to tap all forms and sources of energy to meet the needs of a galloping economy — not only conventional sources such as thermal, hydro and nuclear but also non-conventional sources such as solar, wind and bio.

The fact that we generate 53 per cent of our total electricity of some 146 gigawatts by burning coal and the fact that the current stock of coal is not going to last beyond the next three to four decades should make us sit up and start planning for more sustainable elements in our energy basket. The burning of coal to generate electricity is heavily polluting and we end up emitting almost one tonne of CO_2 for every kilowatt of thermal energy produced. This reinforces the need to find alternative sources for energy generation.

In the case of nuclear power, where we now have a better chance of success following the India-US civil nuclear deal, we will only be able to get around 10 per cent of our power requirements by 2030. As for crude oil, we are importing 78 per cent of our total requirements; it is our single biggest item of import and counts for 37 per cent of the total import bill.

Put these all together and it's not difficult to see that we have a gaping hole in our energy basket which we need to fill up. And in order to do that by 2030, we need to start now.

What should we do

Fortunately, as a nation, we are endowed with the bounty of nature, with plenty of sunshine, wind and biomass. Only we have got so addicted to burning fossil fuels for our daily energy needs that we have turned a deaf ear to the song of the wind and a blind eye to the bright sunshine all around us.

Renewable energy — generated from natural sustainable resources such as sunlight, wind, rain, tides and geothermal heat — provide the best hope for the future. These technologies are especially relevant for a large country like India since they can be used in small off-grid applications, generating power at the point of use. This not only empowers the user and makes him energy-secure but also saves on large losses that occur in transmission and distribution of conventional power that can be as high as 35 per cent.

Wind energy in India has developed very well in the last few years and already some 9,000MW of installed capacity has come up. Offshore and high-altitude areas where winds are stronger provide the best

sites for wind energy, for example in Tamil Nadu and Karnataka (in south India), Gujarat, Rajasthan and Maharashtra (in the west) and Madhya Pradesh (in central India).

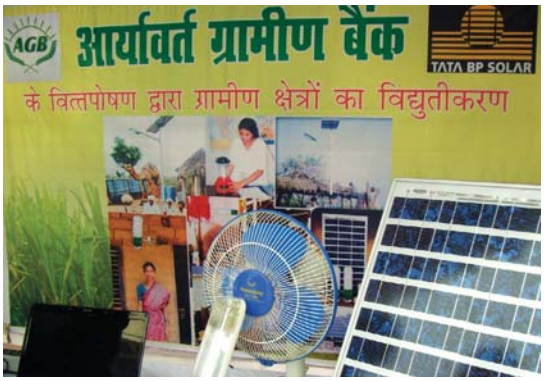
But it is solar energy that represents the most promising and yet most unfulfilled opportunity in the energy sector so far. With about 300 clear sunny days in a year, India's solar power reception is about 5,000 trillion kwh/yr. Photovoltaic (PV) technology (that converts sunlight to electric currents) as well as thermal technology (directly using sunrays for heating water or air) have both existed on a commercial scale for more than two decades.

There are companies like Tata BP Solar which manufacture PV cells / PV modules and solar water heaters; yet solar power has not become popular in India at a mass scale. Why? The main reason is the high initial cost required for solar products — the cost of silicon for PV modules and copper or glass tubes for solar water heaters. These costs will come down, with economies of scale, and with technological improvements, for instance, by reducing the amount of expensive silicon required for PV cells by reducing the thickness of the cells.

Solar solutions

Indeed, the unit cost of solar power has been coming down and will continue to do so while the cost of conventional power will likely keep on rising. At some point, 'grid parity' will be reached, when the cost of solar power becomes equal to that of conventional power. That will be the inflection point when the solar energy industry will take off.

Already, Tata BP Solar offers solar solutions for rural electrification, rural connectivity, spread of education, water pumping for irrigation and drinking, disaster management, highway furniture, green buildings, power backups to banks, water heating for domestic and industrial applications. Our solar home lights have lit up and transformed the lives of hundreds of villagers across India in states like Uttar Pradesh, Chhattisgarh and Haryana.



In collaboration with Tata BP Solar, Aryavart Gramin Bank provides easy finance schemes to rural folk on solar products

> "Renewable energy technologies can bridge the gap in our power needs while helping us save the environment from further degradation"
>
> **K Subramanya**

Some 80,000 villages in India are not yet connected to the grid. Solar lights in rural homes or solar plants at the villages can easily provide electricity to them. Solar lights, which can be self-financed through regional rural banks, help villagers increase their income and also improve their health standards by weaning them away from kerosene lamps.

Tata BP Solar also provides solutions to banks, railways, telecom and petroleum companies to run remotely located or rural branches, ATMs, signalling equipment, repeater stations, petrol pumps — in fact anything that requires electric power. Solar panels when substituting for diesel generators pay for themselves within one or two years. Solar water heaters are now standard features in hospitals, hotels and industries, and are fast catching on at individual consumer level.

Looking at the above picture, it is clear that renewable energy technologies can bridge the gap in our power needs while helping us save the environment from further degradation. One is reminded of what Mahatma Gandhi said: "The earth provides enough to satisfy every man's needs, but but not every man's greed." ●

K Subramanya has been with the Tata group since 1985 and was involved with setting up Tata BP Solar in 1989. He is currently CEO of the company with a vision to touch a billion lives with solar solutions. He is also a key contributor to industry initiatives of CII, SEMI and India Semiconductor Association, among others.