

Food, fuel, water and alternate energy sources

It is only an academic exercise to debate which of the three securities is most important for India: food, energy and water. All of them are equally important. Relatively new and expanding sector of alternate energy sources is forcing us to look at these sectors in an integrated and holistic manner.

It has become a fashion in some elite circle to claim that if only India can implement a strategy to develop alternate energy resources, we will solve our energy security problem. However, the alternate energy sources are not a panacea for our energy problem. At the same time, there is an urgent need to take up research on them on war footing.

According to the Integrated Energy Policy Report of the Planning Commission unveiled last year, even by 2031 alternate energy sources will meet only 5 to 6 percent of our total energy requirements of 1.6-1.8 billion tonnes of oil equivalent, even after increasing 40 times the current usage. Currently, alternate energy sources consisting, among others, of micro hydel, wind, solar, ethanol, bio diesel and energy from waste, are contributing just 2.0 percent of our total energy consumption.

Of the different alternate energy sources, ethanol and bio diesel are now promoted as ultimate answers to our energy security. By 2031, total petroleum demand is likely to reach between 490 and 550 million tones, whereas potential for ethanol and bio diesel production is only 10 and 20 million tonnes respectively.

If we can overcome our insatiable desire to have private transportation like developed countries and develop a world class public transportation system, even better than any where in the world, we can easily reduce the forecast petroleum demand by more than 10 to 20 million tonnes. Simultaneously, if we can improve the railway system to compete with the trucking, then it should be possible to save in addition at least 20 to 30 million tonnes.

These are not some theoretical assumptions to emphasize the need for energy conservation. They are achievable targets. I would even claim that they should be made national goals to achieve energy security.

We should now consider the potential impact of achieving even the modest goals of producing ethanol and bio diesel. There is a heated discussion on the amount of energy obtained from ethanol versus energy used to produce it. Some studies claim the energy balance from bio ethanol is less than one.

At the other extreme, a recent Economist article, gives a rosier picture. According to it, the US ethanol energy balance is 1.3 from corn whereas it is 8.3 in Brazil from sugar cane. However, when we produce ethanol from trees, grasses and other biomass, ethanol produced from such 'cellulosic' sources, it is 16. Despite such high-energy balance, producing ethanol from cellulosic material is much more difficult and expensive.

In addition to the energy balance aspect, we in India need to consider the possible impact food crops based ethanol can have on food prices. In the US, between September 2006 and January 2007, where corn production has been diverted only in small quantities to ethanol, corn price has already gone up by 70 percent.

This has created a problem to neighbouring Mexico, where staple food is tortilla made out of corn. As more land is allocated to produce ethanol in the world, it will affect sugar and even other staple food, resulting in higher prices for food items. This is certainly good for poor farmers. How about the poor who are at subsistence level?

Such an inevitable convergence in food and fuel on account of promoting alternate energy sources can result in food insecurity for India.

In the case of India, we also need to worry about another limiting factor - water, which has already reached crisis state. Just look at the controversy created by the Cauvery Water Tribunal Award. For India, sugarcane based ethanol is simply out of question. Perhaps ethanol from sweet sorghum may be an answer as has been suggested by the Nimbkar Agricultural Research Institute, which is doing research in this area.

In the case of bio diesel also, what may be considered wasteland today may not be wasteland tomorrow if we improve irrigation system. Also, there is the unresolved controversy between the optimum way of producing bio diesel from Jatropha and pongomia. India is completing the phase I of bio diesel mission and getting ready to launch Phase II based on Jatropha technology. The goal is to meet 20 percent of diesel requirement through bio diesel by 2011-12, which is unlikely to happen.

Of the other alternate energy sources where India needs to conduct research on war footing is producing electricity from solar energy. Today it is possible to get solar energy for an investment of \$3-4 per watt with 16 percent energy efficiency according to The Economist whereas fossil fuel based power plant costs \$1.00 to \$0.40 per watt with as much as 60 percent energy efficiency.

Thus solar power generated electricity is still three to four times more expensive than fossil fuel based electricity for many applications. But research breakthrough can make it economical, and that is where India should divert most of its sources. Also for some places far away from the grid, solar power may already be economical.

While alternate energy sources may not be a panacea for our energy security in the next 25 years, we need all the insight and expertise in developing a strategy to prepare India for a future with less fossil fuel. Unfortunately, such a strategy is not on our national agenda today.

(Dr. Bhamy V. Shenoy, an international energy expert, is convener of the Mysore Grahakara Parishat. He can be reached at bhamysuman@hotmail.com)

By Bhamy V Shenoy (© IANS / India eNews)