

Driving the energy economy through bio-fuels

There are immense benefits on the economic, environmental and social front

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India's population is expected to grow from the present 1.35 billion to 1.7 billion by 2042. Quite predictably a large proportion of this population will settle in the urban areas. The trajectory over the period from 2017 to 2042 indicates that urban population will increase from 30-40 per cent in these 25 years and by 2027 itself it would have crossed the 40 per cent mark.

The present per capita energy consumption in India is 1208 KWH vis-a-vis the global average of 3200 KWH. Given India's growth and development needs, its usage still stands somewhere between the two ends of the spectrum.

The country clocked a steady annual rise of 3.5 per cent in energy demand between the first two decades of this millennium. Energy consumption had doubled in this period. An annual growth rate of 4.5 per cent in the energy demand by 2035 is hardly surprising given the country's development imperatives.

The present consumption of energy is in industry, transportation, construction, agriculture and households in descending order.

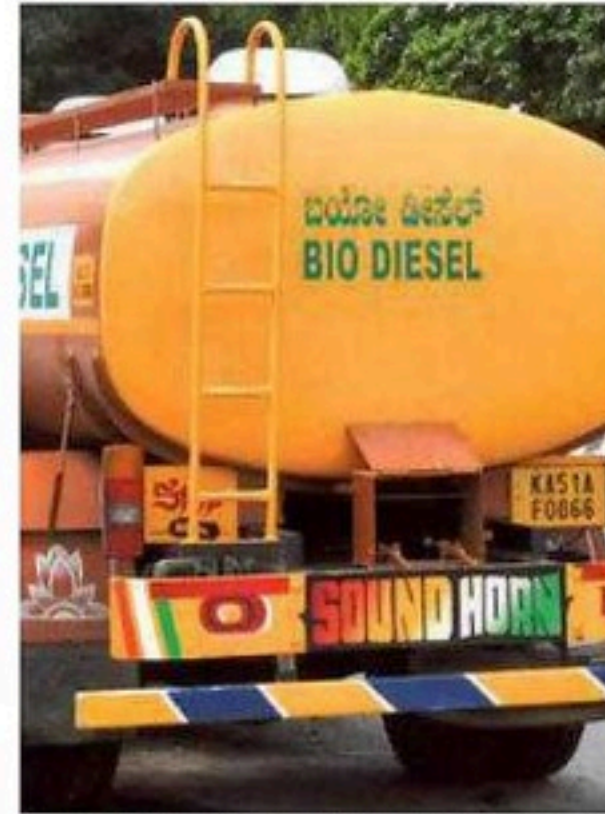
Understandably, demand shall rise in all these sectors in the coming years. While efficient methods of use can ease the stress on resources, it certainly cannot slow down the rate of increase in demand for energy.

India accounts for 18 per cent of the world's population, but produces only 0.6 per cent of the world's natural gas and 0.4 per cent of crude oil. India imports 83.6 per cent of its crude oil requirement. Also 47.2 per cent of India's natural gas requirements are imported. The total expenditure towards this amounted to ₹9,250 billion in 2019-20.

India follows only the US and China in fuel consumption and is set to precede China in the consumption of mineral oil. With around two-third of the imports coming from West Asian and Gulf countries, India's skewed reliance on them can be a matter of concern. As observed by the International Energy Association, the political disturbances in this region are very likely to impact the supply to India, impacting its economy.

Search for domestic sources

It makes sense therefore, to explore possibilities of finding indigenous



Fuel for the future Bhagya Prakash K

sources, including alternative forms of fuel. Prime Minister Narendra Modi is optimistic in this regard. He expressed that bio-fuels would reduce India's dependency on mineral oil and also contribute to mitigating pollution. It will prove to be an additional source of income to farmers and also generate employment.

Work is already progressing on mixing ethanol in transportation fuel. We have also started using Compressed Natural Gas (CNG) in public transport vehicles. However, in order to reduce import of CNG,

prospects of indigenously manufacturing bio-CNG from waste are being explored.

The transportation sector contributes roughly 6.3 per cent of our Gross Domestic Product (GDP). While 72 per cent vehicles rely on diesel, 23 per cent uses petrol and the remaining run on CNG and LPG (Liquid Petroleum Gas). It thus becomes imperative to substitute diesel with alternative fuel. India is also the largest consumer of vegetable oil.

With the right resources and processes 220 crore litres of vegetable oil used in cooking can be reused, to manufacture bio-diesel by 2022. With a capacity to produce 40 per cent of the total requirement of diesel India would be able to save on the import of 32 crore barrels amounting to more than \$22 billion of foreign exchange. This can bridge one-third of the current account deficit caused by oil imports. This will also ease the pressure on the Rupee in the international market and help in improving forex reserves.

In an effort to accomplish the goal of sustainable and environment friendly development by 2030, the government has decided to step up domestic manufacture

of bio-fuels by 10 per cent every year. The government has advanced the target of blending 20 per cent ethanol in petrol to 2025, from 2030. It is evident that a stronger strategic plan and integrated efforts are necessary to match this right intent.

The impact of crude oil and gases on climate change is alarming. This will be one of the key agendas at the sitting of the United Nations Conference of Parties (COP26) at Glasgow in November 2021. Use of bio-fuels is likely to gain momentum as a result of this conference.

Biofuels are a renewable source of energy and being captive in nature, facilitate energy security. Biofuels use agriculture-based feedstock and, therefore, contribute to sustainable decarbonisation through circular bio-economy. Collection of agriculture waste as feedstock creates employment in rural areas, and is a sustainable revenue stream for farmers to boost the rural economy. Rural entrepreneurship gets a fillip to build a robust ecosystem to facilitate supply chain for feedstock, bio-aggregations and transportation.

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