The Ethanol Blending Policy in India

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This analysis of the Government of India’s National Policy on Biofuels argues that while the policy of ethanol blending in petrol is in the right direction, it is fraught with several problems which are rendering the approach ineffective. The most critical ones are the lack of sugar cane for producing ethanol and the policy on pricing of it.

As countries grow, the demand for energy increases manifold. Biofuels have emerged as a substitute for fuel oil, especially for oil-importing countries and serve a multitude of purposes. The most important advantage of these fuels is that they are renewable in nature, and are being seen as sustainable sources of energy. In 2008, the Government of India announced its National Policy on Biofuels mandating a phase-wise implementation of the programme of ethanol blending in petrol in various states. The blending of bioethanol at 5% with petrol was to be taken up by the oil marketing companies (OMCs) in 20 states and four union territories. However, the implementation of this policy has not had much success. This was mainly due to the shortage of ethanol.

This article argues that while the government policy of mandating the blending is in the right direction, it is fraught with several problems which are rendering the policy ineffective. The most critical is the lack of surplus sugar cane from different uses, ambiguity in policy towards ethanol blending and the pricing policy towards it.

Policy towards Ethanol Blending

The Indian approach to biofuels is based on non-food feedstock to deliberately avoid a possible conflict between food and fuel. The National Biofuel Coordination Committee (NBCC), headed by the prime minister was set up in 2010. The policy also proposed that the minimum purchase price (MPP) for bioethanol should be based on the actual cost of production and import price of bioethanol. The price of ethanol would be determined by the Biofuel Steering Committee and decided by the NBCC, and in the event of diesel or petrol prices falling below, the MPP for biodiesel and bioethanol, OMCs would be duly compensated by the government. Biofuel imports would be permitted to the extent necessary and decided by the NBCC under the policy. Additionally, it was mentioned that bioethanol already enjoys a concessional excise duty of 16% and biodiesel is exempt from excise duty.1 Duties and taxes would be levied on imports to ensure that indigenously produced biofuels are not more expensive than the imported biofuels. Thus, the objective of the National Policy on Biofuels has been to encourage domestic production of ethanol and further the ethanol blending programme (EBP) in the country.

Demand and Supply

In India, ethanol production is mainly done using sugar cane as feedstock. For successful implementation of EBP in India, a steady supply of sugar cane (or sugar cane juice) is required as a feedstock. The sugar cane production in 2008-09 was 271.2 million tonnes as per the statistics of Indian Sugar Mills Association (ISMA). In India’s case, industry sources reveal that ethanol production in India has been increasing at a much slower rate than in the world. Bioethanol already enjoys a concessional excise duty of 16% and biodiesel is exempt from excise duty.1 Duties and taxes would be levied on imports to ensure that indigenously produced biofuels are not more expensive than the imported biofuels. Thus, the objective of the National Policy on Biofuels has been to encourage domestic production of ethanol and further the ethanol blending programme (EBP) in the country.

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The per capita consumption of sugar in 2010 stood at 23-24 kg a year, implying that sugar production is around 24.3 million tonnes. To achieve this level of production, sugar cane needs to be cultivated on an area of about 5.5 million hectares with an average yield of 65 tonnes per hectare to yield 357.5 million tonnes. Three factors determine sugar cane production in India: the area under sugar cane production, the sugar cane yield per hectare and the proportion of sugar cane output that is crushed by sugar factories. Thus, to meet the expected increase in demand for ethanol, the area under sugar cane cultivation has to be increased or the yield per hectare.
has to be increased or ethanol has to be produced from alternative feedstock such as sweet sorghum,4 sugar beet or cellulosic raw materials. However, cost-effective saccharification, fermentation and commercialisation of the readily available cellulosic material are currently very costly.

The area under sugar cane production in India has increased nearly 2.5 times since 1950-51 (Pohit et al 2009) touching about 5.04 million hectares in 2007-08. However, it has tended to stagnate in the recent past. The area under sugar cane production is subject to yearly variation, partly because the crop tends to follow a cyclical pattern in terms of output (with three-four years of bumper harvests followed by relatively poor crops over a similar period) and also competition from other crops that can be grown more profitably or within a shorter time than sugar cane. It is also important to note that India has limited arable land5 and sugar cane production requires a long time and large amounts of water and fertilisers. Hence increasing the area under cultivation may not be possible and alternative crops may not suit the climatic and other conditions. Sugar production in India is also characterised by a low average sugar recovery rate of about 9-10% compared to a much higher 12-13% in some other sugar exporting countries such as Brazil. A substantial part of the sugar cane produce (at least 20%) is used for manufacturing traditional sweeteners (like gur) and other uses, leaving only the remaining for making sugar (and molasses).

A major problem is that in India, sugar production in general follows a five to seven year cycle, i.e., production increases over a three to four-year period, reaches a high, which in turn, results in lower sugar prices. As a result of lower sugar price realisations of sugar mills, the sugar cane arrears to farmers increase. This results in lower sugar cane production for the next two to three years. Due to lower sugar production, the prices shoot up resulting in increased area under sugar cane cultivation during the next season, following which there is usually a glut again. It is a systemic problem which needs to be resolved through targeted policy regulations. Some argue that given so many constraints, India can only meet its needs through imports from surplus countries such as Brazil as has been done in the past by the industrial sector in times of shortage of ethanol. This is a viable way out as long as it remains cost effective to do so.

**Pricing of Ethanol**

The cost of producing ethanol varies with molasses prices and hence cyclical variations in sugar cane production largely determine the cost of ethanol production. At present, the government controls the price of cane but directs the sugar mills to sell up to 20% of output under the public distribution system (PDS). Sugar cane prices are fixed on the basis of the statutory minimum price (SMP), in lieu of the minimum support price announced by the central government, and the state advised price (SAP), which is usually fixed by state governments above the SMP. However, sugar prices are determined on the basis of market prices. In October 2009, the Ministry of Consumer Affairs, Food and Public Distribution issued an ordinance in which the Sugar cane (Control) Amendment Order, 2009 changed the pricing regime for sugar cane dictated by the Sugar cane (Control) Order, 1966. Under the new order, the support price for sugar cane is now called the fair and remunerative price (FRP), instead of the earlier SMP, to be fixed by the central government from time to time.6 Sugar prices, on the other hand, do not increase in the same proportion every year.

The empowered group of ministers (EGOM) has fixed the interim refinery gate price of ethanol at Rs 27 per litre. Working backwards, a price of Rs 27 per litre implies that the cost of molasses to the distillery is around Rs 4,800 per tonne. The price of molasses in recent times has increased to Rs 5,000 per tonne in some parts of the country.

The pricing issue is also complicated by the decontrol of petrol prices and administered pricing of sugar cane. The price of crude petroleum forms an upper-limit to the cost of ethanol that the OMCs can profitably use. At the 2008 level of crude oil prices, OMCs were making a profit with the blending of 5% ethanol with petrol. The situation may, however, change with a possible fall in crude prices.

A comparison of the value of petrol (assuming that blending occurs at the storage point), i.e., Rs 33-34 per litre7 as against the ethanol cost of Rs 26-37 per litre8 (assuming different distillery gate prices) – shows that of the three prices Rs 18 (from the earlier estimates of the Planning Commission (2003) and Gonsalves (2006), Rs 21.5 (from the earlier determined contract price of ethanol supply to OMCs), and Rs 27 (interim price fixed by the EGOM), ethanol blending will result in losses for OMCs at the ethanol price of Rs 27 per litre.9

It should be noted that the comparison of the costs of ethanol-blended petrol and fossil fuel-based petrol has been done at the crude oil prices prevailing in April 2009. Changes in crude oil prices would result in a change in the financial aspects of the issue. With the hardening of crude prices in recent times (since late 2010) it can be expected that ethanol blending would again be a profitable proposition.

**Conclusions**

Since the availability of ethanol becomes critical in the implementation of the EBP ways to augment the supply are important. In May 2009, the Planning Commission advised the government to consider providing incentives to encourage companies to acquire sugar cane plantations abroad, especially in countries such as Brazil, to bring ethanol into the country. Other options include collaboration with Brazil and other prospective international suppliers of ethanol in areas of research and development and cross-border investment. These measures along with other steps to augment the domestic availability of ethanol, like the integration of the production and milling of sugar cane to the ethanol production stage can alleviate some bottlenecks.

On the issue of pricing, since sugar cane supply follows a cyclical pattern, ethanol prices would need to be revised periodically to reflect market conditions.10 Additionally, changes in crude oil prices would have a direct bearing on the financial viability of the EBP. There should, therefore, be some thought given to the distributive shares in the situation of high crude prices, and therefore, greater profitability of the programme, i.e., what part should be given to OMCs, consumers and through higher MSP to sugar cane farmers. On the flip side, in the situation of losses, the government needs to set targets for the subsidy burden
that it is willing to shoulder for an environmental cause.

The vehicular fleet of the country is mostly compatible with 5% ethanol blended petrol. With the implementation of the blending programme from the current 5% to the higher levels of EBP (as envisaged in the National Policy for Biofuels, sufficient lead time would be needed for the automobile industry to make the suitable change to the engines.

NOTES

1 No other central taxes and duties were proposed to be levied on biodiesel and bioethanol. Customs and excise duty concessions would be provided on plant and machinery for the production of biodiesel or bioethanol, as well as for all engines run on biofuels, if these are not manufactured indigenously.

2 Grade C molasses is the last category of molasses syrup remaining after repeatedly boiling sugar cane juice of which the maximum possible crystallisable sugar has been extracted. Grade B molasses has comparatively higher percentage of fermentable sugar left and Grade A the highest percentage of these categories.


4 In comparison to grains, sugar, and lignocellulosic biomass, sweet sorghum has a very high per hectare yield in India (Planning Commission 2003).

5 About 48.83% of India's total land area is arable, of which more than 85% is already under cultivation. Land not cultivated at present (including waste and fallow lands, permanent pastures, grazing lands and miscellaneous tree crops) is estimated at around 42 million hectares. Most of this is occupied by marginal and submarginal lands, and the extension of cultivation to this area will be costly, as it requires extensive works for soil and water conservation, irrigation and reclamation. Source: http://agropedia.iitk.ac.in/openaccess/sites/default/files/WS%209%2oJPS.pdf; https://www.cia.gov/library/publications/the-world-factbook/fields/2097.html and http://www.krishiworld.com/html/land_utilisation.html

6 It was also announced that any other authority fixing a price for the crop above the FRP would have to bear the difference. Thus, effectively the new system would discourage the states from announcing their SAPs as they have to bear its burden. The FRP is fixed after taking into consideration the margins for sugar cane farmers on account of risk and profit on the cost of production of sugar cane.

7 The price of petrol has been taken as the petrol price after payment of all excise, education cess, state surcharge, etc, but before the payment of sales tax, dealer’s commission, etc.

8 The ethanol cost has been estimated based on the distillery gate prices, denaturing charges, duty structure and transportation costs till the storage point.

9 The price of ethanol blended petrol has been estimated by assuming a 5% ethanol blend. The price of blended petrol has then been calculated as a weighted average of the blend proportions and the relative prices of the two constituents.

10 The Prime Minister’s Economic Advisory Council (PMEAC) has also suggested that the price of ethanol should be market determined (Business Standard, 17 August 2011).

REFERENCES


