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Ethanol Blending: Present State, Challenges and Future Perspectives

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Abstract

Biofuels in general and ethanol in particular are mostly accepted in the USA, Brazil, European Union and China as a means energy security. Blending of biofuels with petrol and diesel has been acquiring significant position due to its economical and environmental benefits. Planning Commission of India recommends phasing wise implementation of Ethanol Blending Programme since 2003. This paper analyses importance and present state of Ethanol Blending in Indian context. An attempt is also made to examine challenges and future perspectives of Ethanol Blending Programme. Due to short supply of ethanol and technical constraints this programme is partially successful. If rationalization of the alternative feedstock is made possible, the ethanol blending will be success. The preparedness of the automobile industry is a major factor in the implementation of this policy

Keywords :- Biofuels , Ethanol blending , Gasoline, Agro-diversity and Economic viability

Introduction: -

Energy plays a very crucial role in achieving our socio-economic goals and sustain growth rate over the double digit. India's Energy consumption matrix shows that out of the total primary energy consumption, fossil fuels are accounts large share and constitutes 32 per cent share. Like all other fuel – oil importing countries of the world, India's is also highly reliance on import of crude oil and facing a shortage of conventional fossil fuels. Biofuels in general and ethanol in particular have emerged as substitute for fuel oil for countries like India. To promote biofuels and ethanol in particular, the Indian Government initiated an Ethanol Blending Programme in 2003. Ethanol Blending is one of most ambitious programme of India. But since it was been started it is facing several problems and hence it is being partially successful. Hence, present research work aims to identify the challenges before EBP and suggest remedial measures for successfully implementation of Ethanol Blending Programme.

Aims of The Study:-

Present research effort aims at highlighting present state, challenges and future perspectives of India's. Ethanol Blending Policy.

Objectives of study

1. To highlight the background and present state of Ethanol Blending Policy in India.
2. To access the significance of Ethanol Blending Programme in the context Indian economy.
3. To indentify the challenges before Ethanol Blending Programme in India.

4. To suggest remedial measures for proper implementation as well as future prospects of Ethanol Blending Programme in India.

Hypothesis

- The present research paper aims to test the following hypothesis.
- Production of ethanol is increasing with introduction of Ethanol Blending Programme

Importance of Research Topic

Social science research always deals with socio economic problems and will be carried out to give proper solution to solve the problem as soon as run economic, social , political governance and burocretic system effectively and efficiently. In this respect, the present research topic is deals with ethanol industry and ethanol blending policy which is considered as most ambitious policy of government of India. Hence the importance of above both will shows revalance of research topic which lies in the context of sugar industry, sugarcane producers, oil marketing companies and refineries and national economy as whole.

Importance of Ethanol Blending Programme

Importance of Ethanol Blending in general and research problem in particular can be explain as below

- Ethanol is a most commonly used biofuel it can be make from no .of agrian feedstock's
- Ethanol is emerged as a best alternative to fossil fuel or gasoline
- Ethanol is a high octane fuel .Engines using high Octane fuel can run more efficient by using higher compression ratio. It also have higher flame speed
- Ethanol being the best oxidant which helps the petrol burn better when blended with it
- Ethanol reduces overall emissions of carbon monoxide, carbon dioxide (CO₂) and nitrogen oxides (NO₂) when compared with gasoline.
- When ethanol burn, it forms more moles of exhaust gases, which gives higher pressure and more power in the expansion stroke.
- It has latent heat of vaporization which results in a cooler intake process .This raises the volumetric efficiency of the engine and reduce the required work input in the compression stroke.
- Utilization of molasses for the production of ethanol will provide value –addition to the byproduct of sugar mills
- Ethanol Blending Programme has positive financial implication as it ensure price stability and price realization of molasses for the sugar mills This will improve the economic viability of the sugar mills which will turn benefit to sugar cane growers
- Ethanol Blending Programme reduce India's dependence on fossil fuel import as well as ensure energy security
- A stable Ethanol Blending Programme would also ensure sustainable benefits for the sugarcane farmers who are frequently affected in case of bumper sugarcane crops and its lack of market demand

Background and Present State of Ethanol Blending Programme in India

The report of the Committee on Development of Biofuel (2002) under the Planning Commission, recommended to blend biofuels with petrol and diesel. It is further strongly supported by National Biofuel Policy (2009) with making it mandatory to all states. In this respect, Ethanol Blending Programme were designed in following three phases. In **First Phase** the Ministry of Petroleum and Natural Gas issued a notification in September 2002 for mandatory blending of 5 percent ethanol in nine major states and four union territories. GOI has mandated 5-percent blending of ethanol in gasoline nationwide. In **Second Phase**, GOI was intended to supply ethanol blended gasoline in 20 countries and eight union territories of the country in the effective year, 2006. In **Third Phase** Switching over from the existing 10% to 20 per cent blending. Currently this programme is being carried out in 21 states and 4 UTs with immediate target of to achieve 10% ethanol blending in petrol. The implementation of this policy has not much successful in last decade. The following table shows the present state of Ethanol Blending Programme in India

Table No.1 Present State of Ethanol Blending Programme in India.

(Figures in Million Crore)

Year	Ethanol Production	Fuel Ethanol For EBP	Gasoline (Petrol)	Blending Rate in(%)
2006	1898	100 (05.26%)	13056	1.5
2007	2398	200 (08.34%)	14527	1.4
2008	2150	280 (13.02%)	15368	1.8
2009	1073	100 (09.31%)	17606	0.6
2010	1522	50 (03.28%)	19563	0.3
2011	1681	365 (21.71%)	20176	1.8
2012	2154	305 (14.15%)	218442	1.4
2013	2057	382 (18.57%)	23749	1.6
2014	2002	350 (17.48%)	25848	1.4
2015	2292	685 (29.88%)	29651	2.3
2016	2085	600 (28.77%)	32409	1.9

Source :- FAS/New Delhi Estimates Based on information from Trade source

Indian Ethanol industry is in nascent stage with total 2.4 Billion liters / annum installed capacity of ethanol production. Maharashtra and Uttar Pradesh are the leading state in ethanol production with installed capacity of 720 and 713 Million liters/annum .It is followed by Karnataka, Andhra Pradesh, Gujarat Tamil Nadu and Bihar .

GOI with his very first National Biofuel Policy, has mandated 5% blending of ethanol in 20 states and 4 union territories since 2008-2009. The data compiled form the year of 2006-2016 (Table No.1) shows ethanol production is increasing over the period of ten years. Total 1898 million liters of ethanol (Alcohol) were produced of which 100 million liter were made available for EBP which comprises 1.5 % of the 5% only. Ethanol production correlates to ethanol available for EBP with r value of 0.53 as well as Gasoline and Fuel Ethanol with r value of 0.83 Data of 2016 also shows that only 1.9 million liters (600) ethanol is available for EBP out of the total production of 2085 million liters .The above table shows that even though ethanol production is increasing over the period of which a very small amount of ethanol is supply for EBP. The table also shows that the required amount of ethanol as per the 10 percent of is far away from actual availability of ethanol.

Challenges Before Ethanol Blending Programme in India:-

Following sub section deals with the challenges before and measures and future perspective of Ethanol Blending Programme in India. Since the introduction of Ethanol Blending Programme, it has facing following challenges in the implementation of this programme

- ✚ Short supply of molasses for ethanol production
- ✚ Cyclic production of sugarcane
- ✚ Short supply or shortage of ethanol
- ✚ Complexity in pricing issues
- ✚ Differential uses of alcohol or Molasses i.e. use as solvent in Chemical industry(about 40%) as sprit in potable liquor industry (about 45%) and rest is used for blending with petrol.
- ✚ Procurement lag
- ✚ Delays in Distribution
- ✚ Lack of Clean, Clear and continuous Policy Framework
- ✚ Lack of support system for the farmers
- ✚ Absence of Uniform taxation policy
- ✚ Lack of other feedstock Availability rather sugarcane molasses
- ✚ Absence of proper coordination between NBCC and NBSC
- ✚ Weaker supply chain Management

Ways to Augment Sugar production and Availability of ethanol

- ❖ The integration of production and milling up to the ethanol production stage, if implemented on a large scale, could ensure an efficient production setup.
- ❖ Attractive price mechanism needs to be developed .Fuel ethanol price should be linked with the gasoline prices and competitive usage prices per seasons.
- ❖ Efficient Supply chain and Distribution system is necessary to develop

- ❖ Alternative feedstock like cane juice, secondary juice, cellulosic feedstock, sweet sorghum and starch based feedstock needs to be promoted for blending up to 22
- ❖ Financial and fiscal incentives from Government for second generation ethanol production should be provided.
- ❖ Differential uses of ethanol should be discouraged with proper measures which may be favorable for both sector.
- ❖ Technology related assistance Research and Development as well as Innovations from Government for second generation ethanol production should be provide.
- ❖ A sound and separate ethanol policy addressing all the issues related to Ethanol Blending Policy is needs to design and implement.
- ❖ Another measure is that needs to be considered to ensure a sustained supply of ethanol.
- ❖ The preparedness of the automobile industry is a major factor in the implementation of this policy.
- ❖ The other way to enhance ethanol supply in the country is to increase imports from abroad this will make available for other uses of alcohol.

Conclusion:-

As per the recommendation of Planning Commission Ethanol Blending programme were initiated with objective of energy security and Green House Gas emission reduction. National Biofuel Policy , 2008 envisaged blending of biofuel to a level of 20 per cent by 2017 nationwide. Since the availability of ethanol becomes critical in the implementation Ethanol Blending Programme. Short supply of ethanol ,procedural hurdles such as non-issuance of export permits for interstate transport of ethanol, delays in issuing No Objection Certificate , distribution and procurement delays, higher and multiple taxes and levies across differential states have been impacted Ethanol Blending Programme. The peroration of available ethanol comes as a byproduct from cane molasses during sugar production. But In long term perspective, ethanol derived from a cash crop such as sugarcane dose not seems more viable option in terms of price and availability, other sources of feedstock should be tapped. India's agro-diversity , wasteland availability and investment in Research and Development offer several options this respect. Rationalization of the alternative feedstock is made possible , the ethanol blending will be success.

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