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India

Biofuels Annual

2018

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Report Highlights:

On June 4, 2018, the government released the document National Policy on Biofuels 2018, which proposed blend targets of E20 and B5 be met by 2030. With continued reliance on conventional molasses ethanol, and use of commercially unproven, alternative feedstocks for conventional biofuels, as well as an increased emphasis on advanced biofuels, which are not yet commercialized, it is unlikely the new targets can be met if biofuel imports remain banned as set forth in the new policy. India is set to achieve an ethanol blend of 3.2% in 2018; it is second highest ever but still far short of targets as in the past. The rate for on-road biodiesel blending with diesel is estimated at 0.14% in 2018, only marginally higher than in recent years.
Note: Unless otherwise noted, calendar year is used in this report.

Post:
New Delhi

Executive Summary:

On June 4, 2018, the Government of India's (GOI) Ministry of Petroleum and Natural Gas (MoPNG) formally notified the National Biofuel Policy 2018. It came into effect on May 16, 2018, following approval from the Union Cabinet, and builds on the achievements of the previous National Policy on Biofuels 2009 from the Ministry of New and Renewable Energy (MNRE). A target of 20 percent blending of ethanol with gasoline and 5 percent blending of biodiesel with diesel by 2030 is proposed. The major focus of the new policy is to ensure availability of biofuels from indigenous feedstock. As a step in this direction, it planned to conduct biomass appraisals in the country for creating a National Biomass Repository.

The new ethanol-blending program (EBP) stipulates procurement of ethanol produced directly from B-heavy molasses, sugarcane juice, and damaged food grains such as wheat and broken rice. Damaged food grains are allowed when they are unfit for human consumption and under surplus conditions. Industry sources indicated that the oil marketing companies (OMCs) may be able to procure upwards of 1.25 billion liters in 2018. As a result, India is expected to achieve its second highest fuel ethanol market penetration at 3.2 percent in 2018. Last year's blend rate achieved a national average of 1.9 percent. Demand rationing of ethanol from the potable sector (consumption based, such as alcoholic beverages) and the industrial sectors limits the national blend average for fuel ethanol. In theory, all ethanol available in 2018, if used completely for EBP, will meet a 6.5 percent blend target.

Concurrently, the biodiesel blend is less than 0.15 percent due to limited feedstock availability, and lack of an integrated and dedicated supply chain. The raw materials identified for production of biodiesel under the new policy include non-edible oilseeds, used/waste cooking oil (UCO/WCO), animal tallow, acid oils, and algal feedstock, to name a few. There is a renewed focus on imposing stringent rules to eliminate UCO entry into the food stream, and developing a suitable collection mechanism to increase UCO supply for biodiesel production.

With continued reliance on conventional molasses ethanol (with cane juice added), and use of commercially unproven, alternative feedstocks for conventional biofuels, as well as an increased emphasis for advanced biofuels not yet commercialized, it is unlikely the new targets can be met if biofuel imports remain banned as set forth in the new policy. In addition to the consistent focus on unproven feedstocks, sourcing of waste streams have been added but are more costly to collect than dedicated field crops. Additionally, advanced biofuel platforms have not yet been commercialized at scale in North America and Europe despite a decade of support schemes, (and despite proven success at building large markets for conventional or first generation biofuels); this suggests that imported feedstock and conventional biofuels will likely be critical to meet the GOI's goals.

Meanwhile, without substantial imports, the positive contribution biofuels can make now (over the next decade to 15 years) to lowering health costs tied to toxic air pollution and lowering escalating carbon emissions from transportation remains unfilled. Human health costs tied to air pollution have become a

national crisis in many countries, with growing costs that future generations will bear. We must await the actual implementation of measures and support to see what real change the new program will support.

I. Policy and Programs

A) India's New Biofuel Policy

On June 4, 2018, the Ministry of Petroleum and Natural Gas (MoPNG), of the GOI notified the National Policy on Biofuels 2018, which came into effect on May 16, 2018 with approval from the Union Cabinet. The policy seeks to achieve 20 percent blending of ethanol with gasoline and 5 percent blending of biodiesel with diesel by 2030. The 20 percent and 5 percent goals are proposed to be met through; i) growth in domestic biofuel production (1-Generation (G), 2-G and 3-G[1]); ii) use of multiple feedstocks[2]; iii) encouraging biofuel blending to supplement gasoline and diesel in energy and transportation, as well as in stationary and portable applications[3].

The new biofuel[4] policy of 2018 builds on the achievements of the earlier National Policy on Biofuels 2009 and sets the new agenda to be consistent with emerging developments in the renewable sector (excerpt from the new policy). In both past and current biofuel policy, there are consumption but no production mandates for biofuel. In the 2009 policy, a similar aspirational target of 20 percent blending of biofuels by 2017 was proposed, both for biodiesel and bio-ethanol. Progress towards that goal was only marginal for ethanol with maximum average national blend reaching only 2 to 3.3% in recent years. The market for biodiesel (B100) is still nascent. Some momentum generated in past needs to be bolstered by a strong commercial and sustainable strategy. The mandate under the National Biodiesel Mission (NBM) was unmet due to a host of agronomical and economic constraints.

Progress made towards achieving the mandate will ensure energy security, help create new employment opportunities, promote a cleaner and healthier environment, reduce greenhouse gas emissions through proper conversion of agricultural residues/wastes to biofuels, and prevent diversion of UCO/WCO into the food chain while making it available for biodiesel production, all while encouraging optimal use of other available renewable energy resources.

Some of the above outcomes are likely in light of following fact: It is estimated that a target capacity of 100,000 liter per day (equal to max 36.5 million liters/year) at each bio-refinery production goal for 2-G ethanol will require $120 million of capital infrastructure investment. Since 12 such units are planned, total industry investment would be $1.5 billion. This would provide employment in the rural areas to 1,200 people and ensure price stabilization by converting surplus grains and agricultural biomass into biofuels.

i) Ethanol Policy

[1] 1-G: first generation, 2-G: second generation and so on
[2] Creation of the National Biomass Repository is proposed
[3] For example, diesel generators or water pumps for irrigation
[4] Biofuel is defined in the Appendix per the new policy for 2018

India is likely to achieve its second highest fuel ethanol market penetration at 3.2 percent (national average) in 2018, just a fraction lower than the 3.3% achieved in 2016. An upward revision in the price of ethanol (in November 2017) under the Ethanol Blending Program (EBP) for supply to the public sector OMCs through November 2018 encouraged distillers to divert more ethanol for blending with gasoline. Also, a previous provision for the OMC's to cover the cost of the GST and transportation costs has created an incentive for producers to supply ethanol. The recent tenders for supply of indigenous anhydrous ethanol to OMCs stipulate that in addition to ethanol produced from molasses, the ethanol produced from other non-food feed stocks like cellulosic and lingo cellulosic materials and including petro-chemical uses for B30 and B100, shall be allowed, subject to meeting the relevant Bureau of India Standards (BIS Standards).

However, the current biofuel policy 2018 notified in June 2018 allows for procurement of ethanol produced directly from B-heavy molasses, sugarcane juice, and damaged food grains[5] such as wheat and broken rice. During the agriculture crop year (July-June), when the Ministry of Agriculture & Farmers Welfare projects over-supply of food grains, the policy will allow conversion of these surplus quantities of food grains to ethanol, based on the approval of the National Biofuel Coordination Committee.

In addition, using first generation fully developed technologies other alternative raw materials for production of ethanol will be promoted, such as sugar containing sugar beet or sweet sorghum, and starch-containing materials such as corn, cassava, or rotten potatoes. Opening of this route for ethanol production will not only help in utilizing the current capacities of grain-based distilleries but also will cover all the raw materials from which ethanol can be produced and help to harness fully developed 1-G technologies with minimum investment.

The policy document further states that OMCs have agreed to sign Ethanol Purchase Agreements (EPAs) with 2-G ethanol suppliers for a period of 15 years to provide a secure market to private stakeholders and support 2-G ethanol initiatives. Bio-compressed natural gas (CNG), being one of the major by-products in 2-G ethanol bio-refineries and transport fuel, will be brought under offtake assurance by the public sector gas marketing companies.

The current biofuel trade policy restricts the import of biofuels (for fuel use) as it states that imports adversely affect domestic biofuel production. However, when local ethanol prices are strong, other end-users such as the chemical industry prefer to buy imported ethanol, and sugar distilleries benefit from selling it to OMCs. As such, imports will remain restricted to industrial and potable (consumable) use. Additionally, low import duties on ethanol (for making excisable goods) make imports attractive and economically viable, especially when international crude oil prices are rising. Traditionally, India imports ethanol only to meet shortfalls in demand during years of lower sugar production but is open to imports (*for chemical and industrial use*) when available at competitive prices.

Ethanol Administered Price Revised Up Twice and Trade "Restricted" to "Non-Fuel" Purpose Only

[5] The challenges here will be 1) collection and transport costs to plants, 2) (how do) refineries adjust conversion process as mix of food grains delivered to the plants change on a daily basis and that too on a cost effective basis is yet to be seen.

On June 27, 2018, the Cabinet Committee on Economic Affairs (CCEA) approved the following for ethanol to be supplied from December 1, 2018, to November 30, 2019[6]:

- To fix the ex-mill price of ethanol derived out of C heavy molasses to INR 43.70 per liter (from prevailing price of INR 40.85 per liter, approved for ethanol supply from Dec 1, 2017 to Nov 30, 2018). Additionally, GST and transportation charges will also be payable.
- To fix ex-mill price of ethanol derived from B-heavy molasses and sugarcane juice at INR 47.49 per liter. Additionally, GST and transportation charges will also be payable.
- As the price of ethanol is based on estimated FRP for sugar season 2018-19, it will be modified by the MoP&NG as per actual Fair & Remunerative Price (FRP) declared by the Government.
- For ethanol supply year MY 2019/20, ethanol prices will be modified by MoP&NG, GOI, as per normative cost of molasses and sugar derived from the Fair and Remunerative Price (FRP) of sugarcane then.

On August 21, the Ministry of Commerce and Industry (MOCI) issued a notification (Notification No: 27/2015-2020) amending the import policy on biofuels (ethanol and biodiesel). The import policy is now revised from "free" to "restricted" and allowed ethanol imports for non-fuel purpose (industrial and chemical use) on actual user basis as per the National biofuel policy, June 4, 2018. Subsequently, on August 28, 2018, the MOCI notified (Notification No: 29/2015-2020) amendment in the export policy of biofuels. The export policy is also revised from "free" to "restricted" and exports are permitted, but under license for non-fuel purpose. *Please note: since the trade restriction applies equally to bioethanol and biodiesel, it is therefore not covered separately under biodiesel policy.*

More recently, amid surging crude oil prices, the GOI further raised the ethanol price for incentivizing ethanol output and increase blending of ethanol with gasoline to improve cash flows of mills so that they can settle their arrears, support sugar prices, and help increase farmers income. On September 12, CCEA approved ex-mill price of ethanol derived out of B heavy molasses / partial sugarcane juice to INR 52.43 per liter (from prevailing price of INR 47.13 per liter) and to INR 59.13 per liter for ethanol derived from 100% sugarcane juice from prevailing price of INR 47.13 per liter. Lastly, the price for ethanol produced from C-molasses is fixed at INR 43.70 per liter against INR 40.85 per liter. Further, there is a scheme to enhance ethanol production capacity in India. The government will provide financial assistance to sugar mills, which will be used to augmenting and enhance ethanol production capacity in India.

Aspirational Blending Targets (Mandates) Never Reached. The blend targets for ethanol have varied over time and were partially successful in years of surplus sugar production but less so when sugar production declined. Since sugarcane production in India is cyclical, ethanol production also varies accordingly and therefore does not assure optimum supply levels needed to meet the OMC tenders at any given time. In the past, to renew its focus on implementing the EBP, GOI recommended 10 percent mandatory blending of ethanol with gasoline across all cane-growing states. The intent was that states producing a surplus of ethanol could supply it to states having a supply deficit, with the stated goal being to achieve a national-level blend rate of five percent.

ii) Biodiesel Policy

[6] http://www.pib.nic.in/PressReleseDetail.aspx?PRID=1536696

Biodiesel Blending Program 2018

The National average blend rate for biodiesel in fossil diesel has remained below two-tenths of one percent (0.2%) due to multiple constraints, including limited feedstock availability, lack of an integrated and dedicated supply chain, and restrictions on imports. To date, biodiesel is manufactured from imported palm stearin, small volumes of non-edible oils, UCO and animal fats (domestically sourced). The permitted raw materials under the new policy retain the existing list while expanding the list of non-edible oilseeds. Domestically sourced UCO was identified as a feedstock with large potential for expansion.

However, the existing supply of UCO is diverted to the edible stream through various small eateries/vendors & traders. The new policy focus will be to impose stringent norms to keep the UCO out of the food stream, and to develop a collection mechanism to augment UCO supply for biodiesel production. From July 1, 2018, all Food Business Operators are required to monitor the quality of oil during frying. Maximum permissible limit of total polar compound in edible oils is 25%. The implementation of these regulations will require focus on consumer education, enforcement as well as the creation of an efficient system for collection (FSSAI Launches RUCO).

In addition to the above, feedstock availability and its development are key to ensure biodiesel availability and sustainability. The new biofuel policy encourages the usage of wastelands for feedstock generation; local communities from Gram Panchayats (local assembly) and Talukas (an administrative district) will be encouraged to plant non-edible oilseed bearing trees and crops such as **Pongamia pinnata** (Karanja), **Melia azadirachta** (Neem), castor, **Jatropha carcus**, **Callophylum innophylum**, **Simarouba glauca**, and **Hibiscus cannabbinus** for augmenting indigenous feedstock supply for biodiesel production.

Also, farmers will be encouraged to grow a variety of different biomass as well as oilseeds on their marginal lands as inter-crops, and as a second crop wherever only one crop is raised under rain fed conditions. Suitable supply chain mechanisms, feedstock collection centers, and fair price mechanisms for the engaged community are planned for development in coordination with local bodies, states, and concerned stakeholders[7] (excerpt from the new policy document).

The national average blend rate for on-road transport and stationary applications are each estimated at one-seventh of one percent (0.14%) today, or slightly higher than the estimated 0.04% blend rate ten years ago. It is estimated that transport by road and rail account for roughly half of all biodiesel use, and the other half is consumed by off-road farm transport and various stationary applications.

In the past, the National Biodiesel Mission (NBM) identified jatropha (*jatropha curcas*) as the most suitable inedible oilseed to help achieve a proposed biodiesel blend of 20 percent with conventional diesel by 2017. However, using jatropha proved untenable due to a host of agronomic and economic constraints (*please see link to our GAIN report IN7075 in Section IV for background information on NBM*).

iii) Policy For Other Biofuels: Drop-in-fuels, Bio-CNG, Bio-Hydrogen, Bio-methanol, Di-Methyl-

[7] Paragraph 1 to 4 are excerpts from the new biofuel policy

Ether

A task force on waste to energy created by the National Institute for Transforming India (NITI Aayog) has estimated an annual generation of 62 MMT of Municipal Solid Waste (MSW) in India. This waste has a huge potential to produce drop-in fuels and generate power, including refused derived fuel, biogas/electricity and compost to support agriculture. Many technologies are available for converting waste into biofuels and other higher-value bio-chemicals, but are in the nascent stage and need to be proven on a commercial scale. Conversion of such waste into fuels will be promoted for meeting the energy demand in rural areas and also addressing environmental issues.

iv) Other Key Highlights From India's Biofuel Policy 2018:

> Quality Standards: Development of test methods, procedures and protocols will be priorities along with introduction of standards and certification for different biofuels and end use applications. The Bureau of Indian Standards (BIS) has already evolved standards for bioethanol, and biodiesel for standalone and blended form applications. Development of specifications for higher blending levels are underway. It further says that opportunities will be explored to generate carbon credits for the savings on CO2 emissions on the account of biofuel feedstock generation and use of biofuels, in pure or blended form.

> Push for Research and Development: The policy would encourage innovation and provide a push for research & development (R&D), and utilizing developed and emerging technologies.

Identified areas of intensive R&D work include:
(1): Biofuel feedstock production
(2): Advanced conversion technologies from identified feedstock
(3): Technologies for end-use applications including modifications for biofuels
(4): Utilization of bi-products of biofuels

> Distribution & Marketing of Biofuels: Oil Marketing Companies will continue to store, distribute and market biofuels. They will be primarily responsible for maintaining and improving the storage, distribution and marketing infrastructure to meet the requirements of biofuels. The government may also allow other players to distribute and market biofuels depending upon factors such as ensuring quality standards, consumer awareness about blending percentages, warranty requirements etc.

> Pricing of Biofuels: At present, the price of first generation molasses based ethanol for the EBP Program is being determined by the government based on the recommendation of a committee constituted for this purpose. For procurement of biodiesel for blending in diesel, the price is being determined by OMCs. The government will continue to incentivize first generation biofuels by administered prices or market determined prices depending upon various factors including market conditions, availability of biofuels in the domestic market, import substitution requirements, etc. Advanced biofuels will be given differential pricing to further incentivize them. The mechanism for differential pricing for advanced biofuels will be decided by the National Biofuel Coordination Committee.

> Import & Export of Biofuels: Indigenous production of biofuels would be encouraged by a set of practical and judicious incentives. The policy emphasizes the development of a domestic biofuel

industry utilizing domestic feedstock. Allowing imports will adversely affect domestic biofuels and hence the import of biofuels will not be allowed. The policy encourages augmenting indigenous feedstock supplies for biofuel production utilizing the wastelands for feedstock generation. However, depending upon availability of domestic feedstock and blending requirement, the import of feedstock for production of biodiesel would be permitted to the extent necessary. Feedstock import requirements will be decided by the National Biofuel Coordination Committee proposed under this policy. As the domestic biofuels availability is much lower than India's requirements, export of biofuels will not be allowed (few policy developments in past are available in Appendix for reference).

> Financing and Fiscal Incentives: The GOI "will consider" (but Post notes does not commit, as yet) the creation of financial incentives including subsidies, grants, tax credits, advance depreciation on plant expenditures, differential pricing vis-à-vis -1G Ethanol, Viability Gap Funding (VGF of INR 5000 crore ($735 million) in 6 years in addition to additional tax incentives, higher purchase prices as compared to 1G biofuels) etc. for encouraging stakeholders to set up 2-G ethanol bio-refineries [4] while considering the establishment of a National Biofuel Fund.

Joint ventures and investments in the biofuel sector are encouraged. A 100% Foreign Direct Investment (FDI) in biofuel technologies would be encouraged through an automatic approval route provided biofuels produced are for domestic use only. Schemes will be launched to take the "Advanced Biofuel" program forward. In addition to exploring opportunities for generating carbon credits, the National Bank for Agriculture and Rural Development (**NABARD**) and other Public Sector Banks will be encouraged to provide funding, financial assistance through soft loans etc. However, it's yet to be seen when there is no concrete information as regards to the amount set for producers.

> International Cooperation

The policy seeks to establish scientific and technical cooperation (bilateral and multi-lateral) in the biofuel sector, but in accordance with national priorities to include joint research and technology development, field studies, pilot scale plants, and demonstration projects involving R&D institutes and industry.

B) Institutional Mechanism

The National Biofuel Policy proposes to set up a **National Biofuel Coordination Committee** (NBCC) headed by the Minister of Petroleum and Natural Gas and comprised of representatives of concerned ministries. The committee would meet periodically to provide overall coordination, effective end-to-end implementation and monitoring of biofuel programs.

The working group on biofuels is now proposed to be setup under the Chairmanship of the Joint Secretary (Refinery), MPoNG, GOI, along with technical experts, representatives from relevant ministries, OMCs, the petroleum conservation research association (PCRA)[8], and other stakeholders to monitor the implementation of the biofuel program. In addition to the above, various state governments will be encouraged to initiate biofuel developmental activities by setting up **state level biofuel development boards** in line with existing boards in some states (Chhattisgarh, Karnataka, Rajasthan etc.) supported by aid from the respective state governments.

[8] PCRA is an organization established in India in 1978, under the umbrella of the Indian Ministry of Petroleum and Natural Gas that is engaged in promoting energy efficiency in various sectors of the economy.

Role of Stakeholders:

Ministry	Role
MoPNG	Overall coordinating ministry for development of biofuels: • National Biofuel Policy & its implementation • Research, Development & Demonstration on applications of biofuels • Marketing and distribution of biofuels • Blending levels of biofuels • Development & implementation of pricing & procurement policy • Dispute redressal • Foster international collaboration for advanced biofuel research and capacity building • Municipal Solid Waste (MSW) to transportation fuels
Ministry of Rural Development	Planting and supply chain activities along with rural livelihood
Department of Agriculture & Cooperation (Ministry of Agriculture & FW)	Production of plant materials through nurseries and planting for biofuels in coordination with other ministries
Ministry of Environment, Forest and Climate Change (MoEF&CC)	• Biofuel planting in forest lands and environmental issues concerning biofuels • Involvement of communities in maintenance of growing areas and supply chain
Ministry of Science and Technology (Department of Biotechnology and Department of Science & Technology)	• R&D & Demonstration on various feedstocks and improvement of technologies for biofuel development. • Promote innovation and newer research in the biofuel area. • Development of technologies for bio-refinery and value added products.
Ministry of Road Transport and Highway (MoRTH)	• Encourage consumption/usage of biofuels in the transport sector
Ministry of Railways	• Encourage consumption/usage of biofuels
Department of Consumer Affairs (Ministry of CA, F&PD)	• Developing specifications, standards and codes for ensuring quality control of biofuels for end uses
Ministry of Heavy Industries and Public Enterprises	• To advise equipment manufacturers to make equipment compatible with biofuels available in the market
Ministry of New & Renewable Energy	• To produce energy through biogas including enriched biogas, bio-CNG and bio-power etc. from biomass/urban, industrial and agricultural waste
Ministry of Housing & Urban Poverty Alleviation	• To coordinate with states and ULBs for the availability of MSW as an important feedstock for biofuels, including municipal solid waste in urban areas
Ministry of Consumer Affairs, Food & Public Distribution,	• Provide suitable financial incentives to the sugar sector for setting up of ethanol distilleries

Department of Food & Public Distribution	

C) Import Duties/Export Taxes and Levies

Table 1. India: Import duty on Biodiesel (percent ad valorem on CIF value)

ITC HS Tariff Number	Total Import duty
Biodiesel, not containing or containing less than 70% by weight of petroleum oils and oils obtained from Bituminous minerals (<B30-B100) [3826 0000]	24.32 % (10% basic + 12% IGST + 10% Social Welfare Surcharge(SWS) on basic custom duty)
Petroleum oil and oils obtained from Bituminous minerals (other than crude), containing by weight more than 70 % or more of petroleum oils, contain biodiesel, (B1-B30), [2710 2000]	30.98 (10% basic + 18% IGST + 10% Social Welfare Surcharge (SWS) on basic custom duty).

Source: www.cbec.gov.in

Table 2. India: Import duty on Ethanol (percent ad valorem on CIF value)

ITC HS Tariff Number	Total Import duty
Ethyl alcohol and other Spirits, denatured, of any strength; denatured ethanol; and denatured spirits [2207 2000]	Basic custom duty on denatured ethanol for manufacture of excisable goods is 2.5% if the importer follows the procedure set out in the Customs Rules, 2017. However, denatured spirits assessed 5 percent duty for all goods except above.
Undenatured Ethanol [2207 1000] of an alcoholic strength by volume of 80% or higher	150% (SWS exempted)

Source: www.cbec.gov.in

D) Renewable Energy, Greenhouse Gas (GHG) Emissions & Climate Change

A total capacity of 65 GW of renewable energy has been installed in the country so far. By 2022, the GOI plans to add 175 GW of energy from renewable resources of which 100 GW is planned to come from solar, 60 GW from wind power, 10 GW from biomass power[1] and 5 GW from small hydro-power. Biomass power from biomass combustion, biomass gasification and bagasse co-generation reached upwards of 8.3 GW installed capacity as of March 31, 2018 and the target is 10 GW by 2022. With the MoPNG, GOI taking stewardship of the new biofuel policy, the renewed focus of the Ministry of New and Renewable Energy is now focused on generating or producing energy from biogas, including enriched biogas, bio-CNG and bio-power etc. from biomass/urban, industrial and agricultural wastes. The Ministry of Power, GOI, issued **order no. 23/03/2016-R&R** dated June 14, 2018 stating the revised Renewable Purchase Obligation (RPO) targets for the national level. As per the order, the country has a target of 21% share of renewable energy in its total electricity consumption by March

[1] Biofuel isn't included as part of the broader renewable energy outlook

2022.

i) **Transport sector, GHG Emissions and Climate Change**:
The GOI is committed to reduce GHG by 20-25% by 2020 and 33-35% by 2030 over 2005 levels. Moving towards a low carbon economy, a dedicated transport sector will likely support GHG reduction goals. One it will support the goals will be by increasing the present fuel efficiency standards. They propose to do it by upgrading the vehicles from current Bharat Stage (BS)-IV standard to BS -VI fuel [3] compatible by 2020. The new fuel engine standards are likely to reduce harmful emissions and increase fuel efficiency. The GOI was committed to roll out BS-VI norms by 2023, but it revised the deadline to 2020.

End Note for Section I:
Considering the overview of biofuel policy above, India's continued reliance on commercially unproven, alternative feedstocks and despite its increased support for advanced biofuel platforms (which remain un-commercialized at scale), it is apparent that a significant expansion in biofuel use by 2030 beyond current low levels is unlikely without a greatly expanded role for imported feedstock and conventional biofuels. Most of the potential positive contribution biofuels can make over the next decade to 15 years to lower health costs tied to toxic air pollution and lower carbon emissions from transportation will likely remain unfilled if imports are prohibited or heavily restricted. \

Human health costs tied to air pollution have become a national crisis in India and many other countries with growing costs borne by future generations. Also, every ton of GHGs pumped into the air 'today' puts us one step closer to ever-growing negative impacts from global climate change that can't be reversed by pumping one less ton of GHGs into the air 'tomorrow,' and ever closer to a tipping point whereby even if future emissions tied to human activity are lowered, natural cycles will take over releasing more stored carbon into the atmosphere.

II. Gasoline and Diesel Pools

General Economy

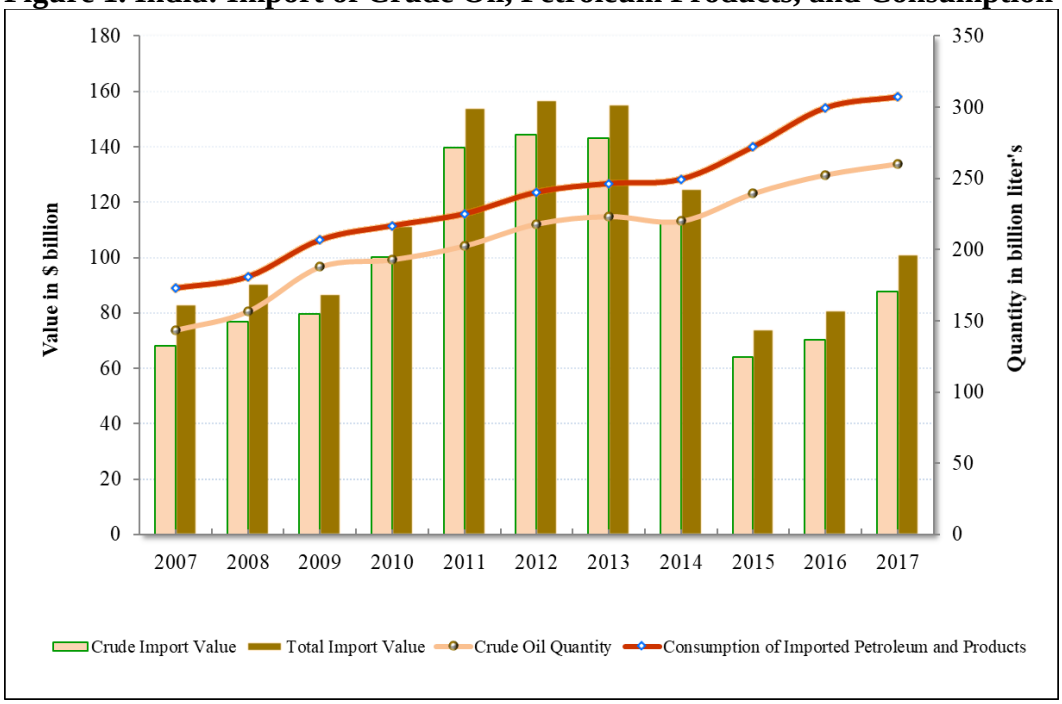
India is Increasingly Dependent on Fossil Fuel Energy Imports
Although energy consumption per capita in India is estimated to be one-third of the global average, strong growth prospects here in the world's fastest growing economy will drive demand for energy across different sectors. Hence, access to adequate and reliable sources of energy becomes vital, particularly when one-quarter of the population lacks access to electricity and dependence on fossil fuels (imported and local) continues to grow. Fossil fuels supply about three-quarters of India's energy demand.

India is the third-largest importer of crude oil after China and the United States and continues to rely largely on imports (mostly from Russia and Algeria). In the last five years, import volumes of petroleum and petroleum products have risen 25 percent to 307 billion liters. However, the associated cost fell by $155 billion in Indian Fiscal Year (IFY) 2013/14 to $81 billion until IFY 2016/17. It grew by more than 25 percent in last fiscal year to $101 billion (see below, Figure 1).

India's total installed power capacity is just under 344,000 megawatts, of which the largest energy source comes from coal (57%), followed by renewables (20%), hydro-electricity (13.2%), gas (7.2%),

nuclear (1.9%) and diesel (0.24%). Among renewable fuel sources, an estimated 49.3% is contributed by wind energy, 31.3% by solar, 12.8% by bio-power and the remainder is from small hydropower. (Source: Central Electricity Authority, Ministry of Power, GOI).

Figure 1. India: Import of Crude Oil, Petroleum Products, and Consumption



Source: Petroleum Planning and Analysis Cell, government of India (GOI),
Time scale in Indian fiscal year

Industry and Transport Sectors are the Largest End-Users of Energy

The industry and transport sectors are the largest end-users of energy in India and account for half of the total energy consumed. The main fuels supplying this demand are coal (in industry), petroleum (in transport), and electricity (in buildings, industry, and agriculture). Growth in the transport sector will continue to fuel petroleum consumption. Transportation consumes close to 70 percent of total diesel supply, 66 percent of which is used by passenger and commercial vehicles. Gasoline is used for transportation, 60 percent of which is for two-wheelers such as motorcycles and scooters. Road traffic accounts for an estimated 60 percent of total freight traffic (vs. air and ship) and 90 of total passenger traffic. Currently, diesel alone meets an estimated 46 percent of transportation fuel demand, followed by gasoline at 24 percent (Figure 2.) Gasoline and on-road diesel consumption combined are forecast to rise over the next 5 years from the current estimate of 98 BLs in 2018 to 126 BLs by 2023 (source IEA, 2018).

The Draft Auto Policy 2018 Focuses on Green Mobility and Emission Control

According to the draft National Auto Policy, February 2018 from the Ministry of Heavy Industries and Public Enterprises, GOI seeks to promote clean, safe, efficient and comfortable mobility for every person in the country, with a focus on environmental protection and affordability. The new policy includes: 1) a 10-year strategy (until 2028) for emission standards; 2) adopting reductions in CO_2 through Corporate Average Fuel Economy (CAFE) regulations; 3) introducing criteria for vehicle length and CO_2 emissions to classify vehicles for taxation; 4) defining a list of target technologies in the areas

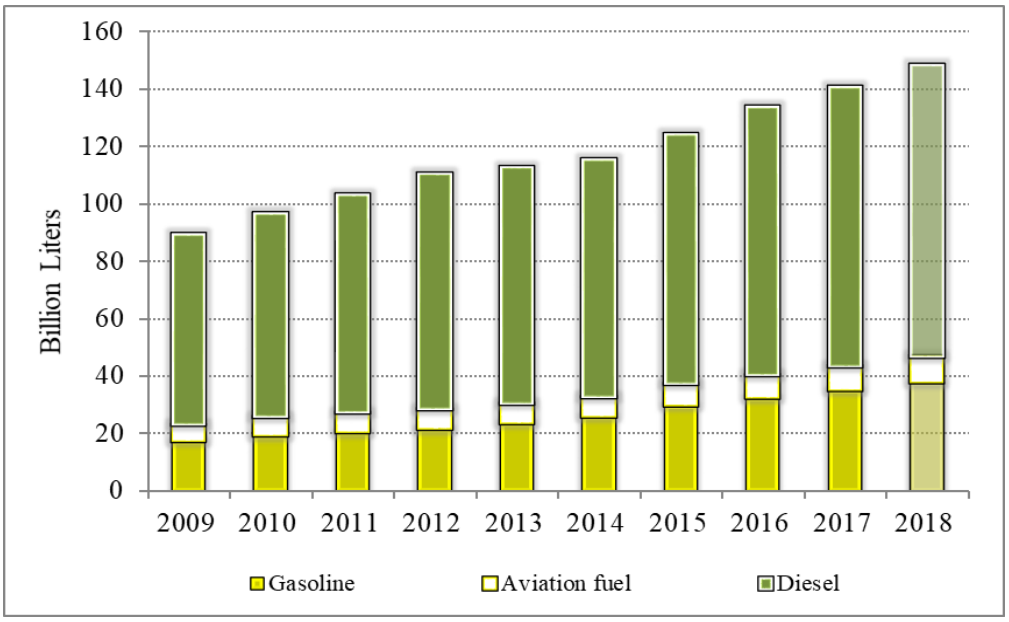
of green mobility, emission control, and safety with corresponding components and equipment that will be eligible for import duty reductions; 5) finalizing a green mobility roadmap including emission and fuel consumption standards, along with incentives and related infrastructure investments; 6) conducting a detailed study on the requirements of public infrastructure for green vehicles to determine the quantity, density and mix of green mobility infrastructure requirements, and 7) including standards for green vehicle infrastructure in terms of power supply, connectors, refueling etc. (Source: Draft Auto Policy 2018).

Table 3. India: Gasoline, Diesel and Jet Fuel Use History (Million Liters)

Calendar Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Gasoline Total	17,606	19,563	20,716	21,842	23,749	25,848	29,651	33,265	35,956	39,015
Diesel Total	66,390	71,041	75,866	82,238	82,256	82,674	87,064	91,965	95,041	102,079
On-road	39,834	42,625	45,520	49,343	49,354	49,605	52,239	55,179	57,025	61,247
Agriculture	7,967	8,525	9,104	9,869	9,871	9,921	10,448	11,036	11,405	12,249
Construction & Mining	2,656	2,842	3,035	3,290	3,290	3,307	3,483	3,679	3,802	4,083
Shipping & Rail	3,320	3,552	3,793	4,112	4,113	4,134	4,353	4,598	4,752	5,104
Industry	7,303	7,815	8,345	9,046	9,048	9,094	9,577	10,116	10,455	11,229
Heating	5,311	5,683	6,069	6,579	6,580	6,614	6,965	7,357	7,603	8,166
Jet Fuel Total	5,641	6,145	6,809	6,626	6,789	6,960	7,564	8,458	9,288	9,743
Total Fuel Markets	**89,637**	**96,750**	**103,392**	**110,706**	**112,794**	**115,482**	**124,280**	**133,688**	**140,285**	**150,837**

Source: Industry and trade sources

Figure 2. India: Consumption of Liquid Fuels, In Calendar Year



Source: Petroleum Planning and Analysis Cell, government of India (GOI)
* Estimated for 2018

III: ETHANOL

India has around 330 distilleries, which can produce over 4.6 billion liters of rectified spirits (alcohol) per year. Of this total, about 165 distilleries have the capacity to distill over 2.2 billion liters of ethanol (denatured and undenatured) used as fuel, industrial chemicals, and beverage. India's EBP was based more on sugar molasses, a by-product of the sugar industry, and not directly from sugarcane, corn, or any other potential domestic raw material sources available in the country. However, the current biofuel policy for 2018 has increased the scope for including other raw materials, in addition to encouraging optimal capacity utilization of grain-based distilleries.

Consumption

India's total ethanol consumption will outgrow production for the fourth consecutive year due to an uptick in fuel ethanol purchases by industry and a consistent rise in demand from the industrial and potable sectors (Figure 3). The ethanol consumption demand growth (8 percent annual, 5 year average) is rather strong compared to production growth although both have risen, but in response to different demand drivers: the rise in fuel prices have contributed to growth in ethanol consumption and a strong recovery in sugarcane production this year has contributed to production growth.

Total ethanol consumption is expected to reach an all-time record high of 3.1 billion liters in 2018. (India achieved its highest ethanol market penetration at 3.3 percent (national-level blend) in 2016). The GOI mandatory use of 'indigenous ethanol only' for fuel under the EBP is expected to rise from 675 million liters in 2017 to a record 1.25 billion liters[9] this year; this is 85 percent above last year and marginally above the 1.1 billion liters blended in 2016. The remaining 1.9 billion liters will be used by

[9] This may show incremental increase given current change in trade dynamics

the industrial and potable alcohol sectors (which are exempted from GST). Since the quantity of ethanol demanded at higher prices may be less, the industrial uses and the potable sector will need to augment some of its supply from grain-based distilleries, partly from raw material imports or by directly importing the finished products.

Production

An estimated 2.55 billion liters (all time record) of ethanol will be produced in 2018, 52 percent above last year. An anticipated rise in sugarcane production in 2018 and consequent increase in availability of molasses will bring an additional 875 million liters of ethanol into the supply chain compared to last year's supply[10]. Hypothetically, if all the ethanol produced in 2018 is made available for EBP, than it will meet a 6.5 percent blend target. However, demand rationing from potable and industrial sectors will limit the national blend average to 3.2 percent. Industry sources indicated that the OMCs may be able to procure upwards of 1.3 billion liters in 2018. With around 166 refineries, the production capacity of combined plants in the last ten years have risen by 800 million liters to 2.3 billion liters in 2018. The capacity utilization in 2018 will be 111 percent after two years of successive underutilization on supply concerns.

The remunerative price to ethanol suppliers is expected to reduce cane farmer's arrears, substantially increase availability of ethanol availability for EBP Program, reduce import dependence, bring additional revenue to the agricultural sector, and of course to proliferate a more environmentally friendly fuel.

For background information on the ethanol program, please see our Biofuel Annual 2017 GAIN report IN7075.

Trade

In 2018, India will continue to be a net importer of ethanol (all end uses) despite the rise in its domestic production. The United States has become the near sole supplier of India's imports, and exports will rise on growing demand from African nations and neighboring countries. The preceding statement assumes current market conditions and the subsequent narrative is based on prevailing market trends.

Imports

Imports are **allowed** only for **non-fuel** purpose subject to actual user condition. They backfill **supply gaps** in ethanol demand for industrial chemicals, which usually gets smaller during bumper sugarcane harvests and surplus sugar production thereby leaving additional feedstock (molasses) for fuel ethanol production. The supply deficit will be slightly narrower in 2018 due to a substantial rise in domestic production, but imports will continue to augment cumulative demand not met through local supplies. As a result, ethanol imports in 2018 are forecast at 640 million liters (mostly denatured), second highest in a decade. The share of U.S. ethanol in the total import basket has grown by 22 percent in the last five years to 96 percent in 2017. China, South Korea, Pakistan and Bhutan filled in remaining 4 percent market share.

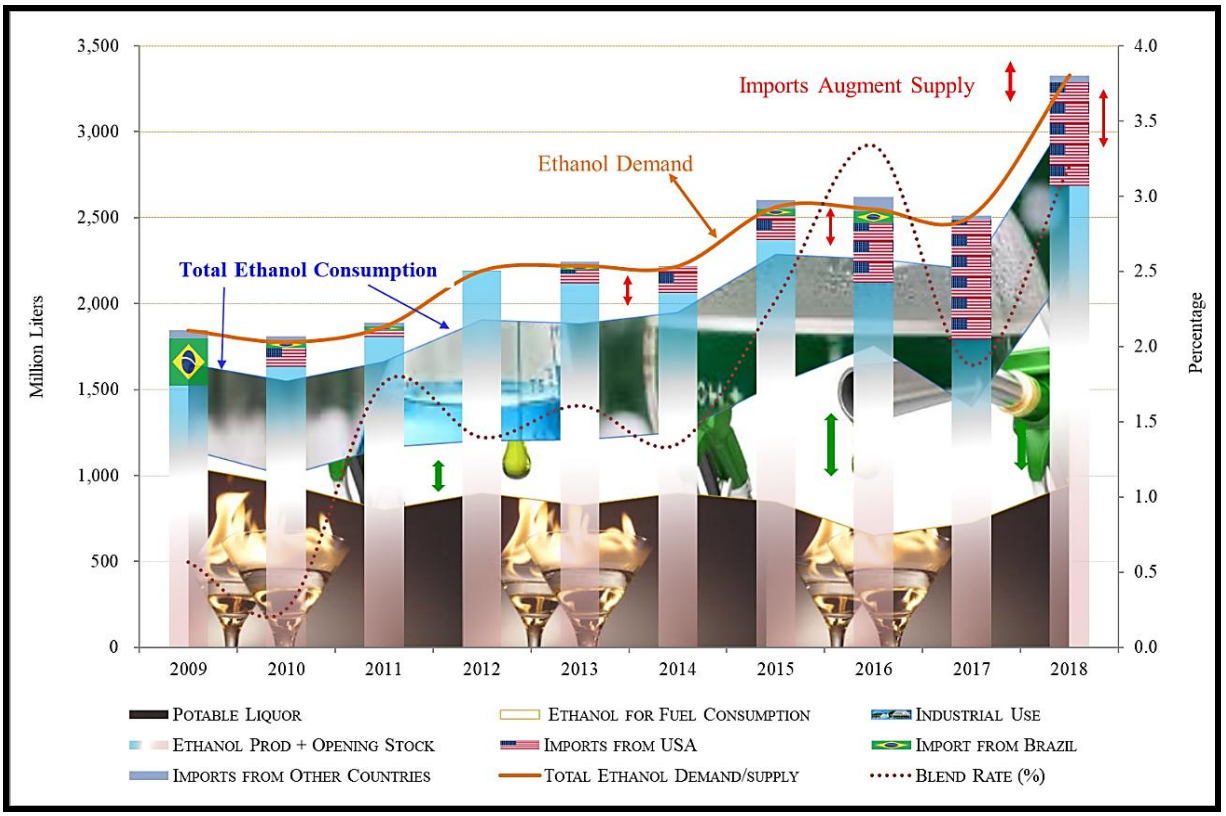
Exports

Ethanol exports in 2018 are expected to rise to 164 million liters (mostly undenatured), 16 percent above

[10] Assuming all available molasses is converted into ethanol.

last year. After its peak export sales in 2013 (233 million liters), Indian exports of ethanol have declined by an average of 15 percent per year on tighter supply and strong local demand. That trend seems to have reversed itself in the last two years as export sales have recovered (close to the five-year average sales figure), as local supply is enough to match consistent rise in demand from African nations, and neighboring countries. In 2017, Nigeria, Ghana, Angola, Nepal, and Kenya were the top five export destinations for Indian ethanol. However, India faces stiff competition from other major ethanol suppliers from the United States, South Africa, United Kingdom, and Canada. Note: biofuel (e.g., fuel grade) exports are not allowed when domestic supply is lower than the country's requirement (also covered under the Policy section).

Figure 3: India. Ethanol Production, Supply and Consumption



Source: FAS/USDA Data

Duties

Currently, the basic customs duty on denatured ethanol is 2.5 percent. It was reduced last Indian fiscal year from 5 to 2.5 percent for the manufacture of excisable goods[11] (industrial chemicals, subject to actual user conditions (Customs Notification No.12/2016). Before July 11, 2014, the duty was 7.5 percent (Customs Notification No.12/2014).

[11] Chemical products such as ethanol, ethanol derivatives and intermediate products find wide applications in life sciences (pharmaceuticals), crop sciences (e.g., selective herbicides), paints & varnishes, industrial specialties and solvent applications.

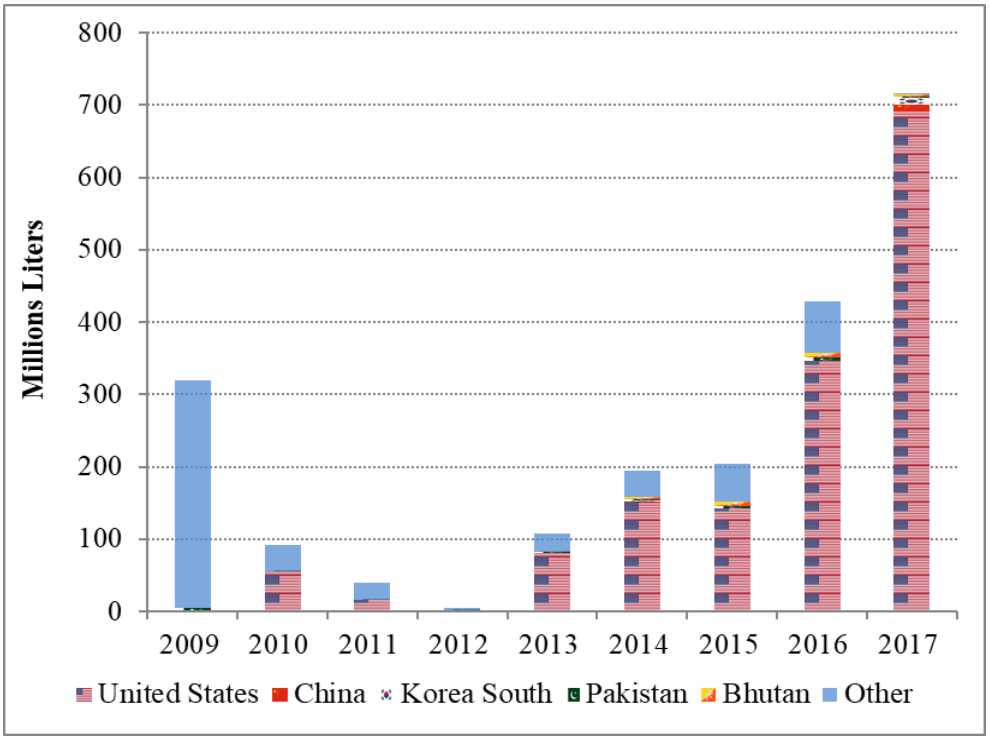
Note: Developments in EBP are covered in the Appendix.

Table 4. India: Ethanol Used as Beverage, Fuel, and Other Industrial Chemicals (Million Liters)

Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Beginning Stocks	453	112	125	33	60	60	76	61	124	140
Production	1,073	1,522	1,681	2,154	2,057	2,002	2,292	2,061	1,671	2,547
Imports	320	144	61	5	104	157	194	428	716	642
Exports	14	53	119	177	233	180	165	136	141	164
Consumption	1,720	1,600	1,715	1,955	1,932	2,000	2,345	2,290	2,230	3,070
Fuel Consumption	100	50	365	305	382	350	685	1,110	675	1,250
Ending Stocks	112	125	33	60	56	35	11	74	90	45
Production Capacity										
Number of Refineries	115	115	115	115	115	115	160	161	161	166
Nameplate Capacity	1,500	1,500	1,500	2,000	2,000	2,000	2,100	2,210	2,215	2,300
Capacity Use (%)	0.72	1.01	1.12	1.08	1.03	1.00	1.09	0.93	0.75	1.11
Co-product Production (1,000 MT)										
Bagasse	85,509	87,690	102,714	108,309	102,360	105,642	108,699	97,485	79,176	113,869
Press Mud	11,401	11,692	13,695	14,441	13,648	14,086	14,493	12,852	10,438	15,012
Feedstock Use for Fuel (1,000 MT)										
Molasses	417	208	1,521	1,271	1,592	1,458	2,854	4,625	2,813	4,167
Market Penetration (Liters - specify unit)										
Fuel Ethanol	100	50	365	305	382	350	685	1,110	675	1,250
Gasoline	17,606	19,563	20,716	21,842	23,749	25,848	29,651	33,265	35,956	39,015
Blend Rate (%)	0.6	0.3	1.8	1.4	1.6	1.4	2.3	3.3	1.9	3.2

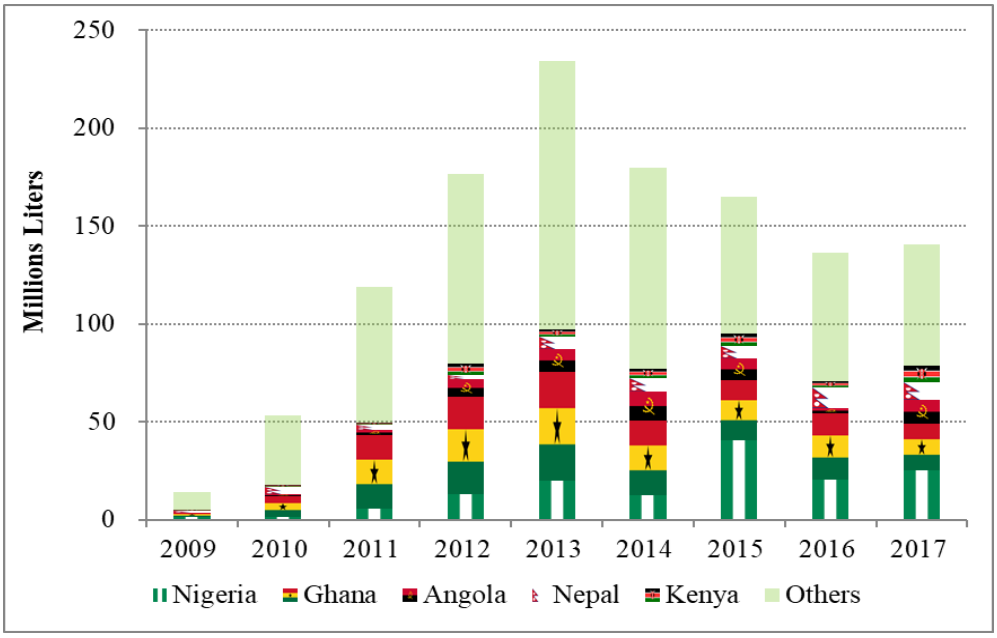
Source: FAS and Industry Source

Figure 4: India. Ethanol Imports



Source: U.S. Census Bureau, GTA and Ministry of Commerce, GOI

Figure 5: India. Ethanol Exports



Source: GTA and Ministry of Commerce, GOI
Others: include Tanzania, Uganda, Jordan, Kenya, Angola, Cote d'lvoire and Congo

IV. Biodiesel/Renewable Diesel

The market for biodiesel is still nascent and can grow only if there is a strong commercially viable strategy for building a sustainable biodiesel industry. Presently, India has six plants with combined annual capacity (installed) to produce about 650 million liters of biodiesel per year. The production capacity of existing plants range from 11 million liters to 280 million liters. Biodiesel is mainly produced from palm stearin, UCO and animal fats. Past field trials using ***jatropha spp*** and non-edible oilseeds grown on non-arable, rainfed lands have failed to support the development of a commercially viable biodiesel industry, and there is little indication that this model can ever succeed to produce significant volumes of biofuel even with government support. India does not produce drop-in renewable diesel.

Consumption

Although conservative by some estimates, the annual consumption of biodiesel is reported to be growing steadily at 2-3 percent (CAGR). It is estimated that transport by road and rail account for roughly half of all biodiesel use, and the other half is consumed by off-road farm transport and various stationary applications. The national average blend rate for on-road transport and stationary applications are each estimated at one-seventh of one percent (0.14%) today or slightly higher than the estimated 0.04% blend rate ten years ago.

A few of the bulk buyers are the Indian Railway, State Road Transport Corporation (of Karnataka and Telangana states), fleet owners of road transport companies, and port authorities. Other end-users or consumers are largely an unorganized group representing small and medium scale enterprises, progressive farmers (operating irrigation pumps and tractors), brick kilns, cellular mobile communication towers, and back-up power diesel generators. Per media reports, biodiesel will be retailed at select government owned outlets.

According to industry sources, locally produced biodiesel is usually offered at an 8 to 10 percent discount to the prevailing retail price of diesel, which means its price is roughly equal to diesel after accounting for the slightly lower energy density of biodiesel. The current GST rate on biodiesel is 12 percent (as of January 25, 2018). Earlier, with the implementation of GST from July 1 2017, tax levied on biodiesel had gone from 6 percent in excise duty to 18 percent, making it unviable for the manufacturers, and not profitable for the end users[12]. Further, industry experts acknowledge that without incentives to cover a portion of production costs or tax policy that favors biodiesel over diesel at the pump, growth of the biodiesel sector will remain mostly flat.

Production

India will produce upwards of 185 million liters of biodiesel in 2018, an additional 18 million liters above last year. Biodiesel producers use non-edible industrial oil (palm stearin), UCO, animal fats, tallows and 'other oils' (sludge, acidic oils, and tree borne oils etc.) to produce biodiesel, thereby utilizing close to 29 percent of the installed capacity. While the use of animal fats and tallows has remained constant, the remaining feedstock use has shown steady growth, namely non-edible industrial

[12] Basis New Delhi, a dealer pays INR 15.33 per liter (equal to 36 percent that includes Central excise duty and road cess) for obtaining fossil diesel from OMCs. After adding his commission, let us say INR 2.53/liter (4.3%), a VAT of 17.1% (includes pollution cess) equal to INR 10.45 per liter) is charged which will bring retail diesel price to INR 71.34 per liter. The basic cost of fuel after refining is INR 43.03 per liter as of September 4, 2018. Kindly note: the Central excise duty is a fixed amount and not a percentage on price. Additionally, the 5 percent road and infrastructure cess on ethanol-blended petrol up to 10 percent and bio-diesel up to 20 percent has been abolished (Excise on Biodiesel, Excise on 10% blend gasoline, Excise on 5% blend gasoline).

oil and UCO.

There is no official regulation on the supply of UCO or 'other oils' for biodiesel production, and biodiesel sales have shown just only the smallest incremental growth in recent years, with most of the feedstock sourced from the food processing industry and restaurants. Some firms claim to import smaller quantities of biodiesel and sell it locally after meeting prescribed Bureau of Indian Standards (BIS) standards. The new biofuel policy for biodiesel focuses on stringent norms to prohibit UCO from reuse in the food stream, and developing suitable collection mechanisms to increase the availability of UCO for biodiesel production.

Additionally, for sustainable biodiesel production to grow there is a need for a strong commercially viable strategy, as capacity utilization is less than 30 percent. In past, a few measures such as deregulated diesel prices, allowing bulk sale of biodiesel (B100) by authorized dealers, and authorization of joint ventures of OMCs and private manufacturers to supply to bulk consumers have supported some of the efforts downstream.

Trade

Beginning 2014 and running through 2016, a little more than a quarter of total biodiesel production was exported before declining through 2018 as growing domestic demand left little exportable surplus. Compared to average export sales of 39 million liters made during 2014 to 2016, the export forecast for 2018 is just 7.4 million liters. However, during same period, imports grew five-fold to 10 million liters in 2018, indicating small but steady growth. The EU, China, Malaysia and Indonesia are major suppliers of biodiesel to India while India's major export destinations are the Malaysia and EU.

Table 5. India: Biodiesel Production from Multiple Feedstocks (Million Liters)

Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Beginning Stocks	0	45	15	13	14	14	9	12	12	18
Production	75	100	111	126	132	138	152	158	170	187
Imports	0.0	0.0	0.0	0.0	0.3	1.7	0.8	2.7	7.1	9.9
Exports	0	0	0	0	3.9	41.5	33.1	41.7	7.6	7.4
Consumption	30	131	113	125	125	81	106	108	163	187
Ending Stocks	45	15	13	14	18	31	23	23	18	21
Production Capacity (Million Liters)										
Number of Biorefineries	5	5	5	5	6	6	6	6	6	6
Nameplate Capacity	450	450	450	460	465	480	500	550	600	650
Capacity Use (%)	16.7%	22.2%	24.7%	27.4%	28.4%	28.8%	30.4%	28.7%	28.3%	28.8%
Feedstock Use for Fuel (1,000 MT)										
Non-edible Industrial	30	50	58	65	70	75	85	90	100	110
Used Cooking Oil	35	38	42	48	49	50	55	55	55	60
Animal Fats & Tallow's	3	6	6	7	7	6	5	6	6	8
Market Penetration (Million Liters)										
Biodiesel, on-road use	15	36	31	42	49	32	41	48	72	83
Diesel, on-road use	39,834	42,625	45,520	49,343	49,354	49,605	52,239	55,179	57,025	61,247
Blend Rate (%)	0.04	0.09	0.07	0.08	0.10	0.06	0.08	0.09	0.13	0.14
Diesel, total use	66,390	71,041	75,866	82,238	82,256	82,674	87,064	91,965	95,041	102,079

Source: Industry and Post estimates
* CY 2018 is projected

Few key developments in for NBM for 2017 and 2018 are separately covered in the Appendix.

V. Advanced Biofuels

ADVANCED BIOFUELS

The Indian biofuel industry, both private and public sector, claim some success in developing the technology needed to convert biomass from wood and agricultural wastes (corn cob, bagasse, stalk of forage crops). Trials, which are mostly in R&D stage, are still underway to process municipal solid waste and micro-algae into advanced biofuels. The new biofuel policy proposed to take advanced biofuel program forward through host of fiscal incentives, investment in R&D (with foreign collaboration) and a differential pricing structure. Later will however be decided by the National Biofuel Coordination Committee (please refer policy section). Note: advanced biofuels defined in Appendix.

Industry experts believe that the suitability of second-generation biofuels for countries respective needs must be evaluated against available bio-energy options to achieve the best possible socio-economic benefit. Generally speaking, the only breakthroughs observed in this domain are biofuel and other bio-chemicals made from municipal solid waste using everything that is thrown away except metal and glass; another breakthrough involves a process which uses waste gasses from steel plants and heavy industry.

VI. Appendix

The National Policy on Biofuels-2018 **defines biofuels** and permits the use of the following feedstock:

1) **Bioethanol**: ethanol produced from biomass such as sugar containing materials, like sugar cane, sugar beet, sweet sorghum etc.; starch containing materials such as corn, cassava, rotten potatoes, algae etc., and cellulosic materials such as bagasse, wood waste, agricultural and forestry residues or other renewable resources like industrial waste;

2) **Biodiesel:** a methyl or ethyl ester of fatty acids produced from non-edible vegetable oils, acid oil, used cooking oil or animal fat and

3) **Advanced Biofuels**: fuels which are (1) produced from lingo-cellulosic feedstock's (i.e. agricultural and forestry residues, e.g. rice & wheat straw/corn cobs & stover/bagasse, woody biomass), non-food crops (i.e. grasses, algae), or industrial waste and residue streams, (2) having low CO2 emission or high GHG reduction and do not compete with food crops for land use. Fuels such as Second Generation (2G) Ethanol, Drop-in fuels, algae based 3G biofuels, bio-CNG, bio-methanol, Di Methyl Ether (DME) derived from bio-methanol, bio-hydrogen, Drop-in fuels with MSW as the source / feedstock material will qualify as "Advanced Biofuels".

i) **Drop-in Fuels**: any liquid fuel produced from Biomass, agricultural-residues, wastes such as municipal solid wastes (MSW), plastic wastes, industrial wastes etc. which meets the Indian standards for motor spirit (MS), high speed diesel (HSD) and jet fuel, in pure or blended form, for its subsequent utilization in vehicles without any modifications in the engine systems and can utilize existing petroleum distribution system.

ii) **Bio-CNG:** purified form of bio-gas whose composition & energy potential is similar to that of fossil based natural gas and is produced from agricultural residues, animal dung, food waste, MSW and sewage water.

The major thrust of this policy is to ensure availability of biofuels from indigenous feedstock. As a step in this direction, the creation of a National Biomass Repository is proposed following an appraisal of biomass across the country. Potential domestic raw materials for production of biofuels are:

a) For Ethanol Production: B-Molasses, Sugarcane juice, biomass in the form of grasses, agriculture residues (rice straw, cotton stalk, corn cobs, saw dust, bagasse etc.), sugar containing materials like sugar beet, sweet sorghum, etc. and starch containing materials such as corn, cassava, rotten potatoes, damaged food grains such as wheat and broken rice, and surplus food grains as available. Algal feedstock and cultivation of seaweeds can also be a potential feedstock for ethanol production.

b) For Biodiesel Production: Non- edible oilseeds, Used Cooking Oil (UCO), animal tallow, acid oil, algal feedstock etc.

c) For advanced biofuels: Biomass, and MSW.

 # Historical key policy developments:

- On August 1, 2016, MoPNG, GOI, announced initiatives to advance the biodiesel program (PIB Press Release):

- A newly formed Steering Committee in the Ministry is to lead the national biofuel program.
- A separate Biofuel Cell was initiated in the MoPNG with a dedicated focus on biofuels. The Cell, besides being a technical repository on biofuels, also monitors biodiesel procurement and blending by OMCs.
- The Bureau of Indian Standards (BIS) revised the standalone Biodiesel (B100) specification and developed specifications for biodiesel blends from B6-B20.

- On August 10, 2015, the MoPNG, GOI, notified Amended Order 2015, (Notification No G.S.R. 621 (E)), Motor Spirit and High Speed Diesel) which included a clause directing limited purpose sale of bio-diesel blending with High Speed Diesel (HSD):

  - The Federal government may permit the **bulk sale** of biodiesel (B-100) for blending with HSD per prescribed BIS standards to **bulk consumers** having a minimum requirement of biodiesel for their own consumption by a tank truck load supply which shall **not be less than twelve thousand liters.**
  - In the linked policy, oil companies include the OMCs, any private bio-diesel manufacturer, the authorized dealer of such oil companies, and joint ventures of Public Sector OMCs authorized by the Federal government.

- On June 5, 2015, the GOI Union Cabinet approved the following decisions:

  - Ethanol produced from **non-food feedstock** besides molasses such as cellulosic and ligno cellulosic materials and including petro-chemical uses, will be allowed to be processed subject to meeting the relevant BIS standard.
  - Sugarcane juice may not be used for production of ethanol.
  - The MS and HSD Control Order may be amended to acknowledge private biodiesel manufacturers, their authorized dealers, and joint ventures (JVs) of OMCs authorized by MoPNG as dealers, to have marketing and distribution functions for the supply of biodiesel to consumers. Earlier, on January 16, 2015, the Union Cabinet amended Paragraph 5.11 and 5.12 of the national biofuel policy to address the direct sale of biodiesel.
  - Relaxation of marketing resolution No. 23015/1/20001 dated March 8, 2002 and a new clause giving marketing rights for B-100 to the private bio-diesel manufacturers and authorized dealers.
  - The price of bio-diesel will be market determined (Source: Cabinet-decisions-on-Biofuels).

- On December 10, 2014, the GOI announced a price control schedule for fuel ethanol procurement for multi-state OMCs. The program fixes landed ethanol prices at OMC depots from INR 48.50 to INR 49.50 per liter, a three to five percent increase over the previous price.

  - A Minimum Support Price (MSP) mechanism for inedible oilseeds was put in to place to provide a fair price to oilseed growers, subject to periodic revision.
  - Brought biofuels under the umbrella of "Declared Goods" by the GOI to ensure their unrestricted interstate and intrastate movement. Except for a concessional excise duty of 16 percent on bioethanol, no other central taxes and duties are proposed to levied on biodiesel and bioethanol.

 # Developments in EBP

CY 2017	OMC floated tender (2 cycles until Feb 2017) seeking 2.8 billion liters of ethanol for blending with gasoline for supply during CY 2017. Further, it is estimated that by end of CY 2017, India would require more than seven billion liters (Table 1) of ethanol to meet its ambitious target of 20 percent EBP. ^^ During CY 2017 an estimated 675 million liters of ethanol was blended with gasoline. On October 17, 2017, a tender was floated by OMC for the supply of 3.13 billion liters of anhydrous ethanol at OMC locations for the period of Dec 1, 2017 through November 30, 2018. Among other qualifying criteria in the tender document, one was that the bidder must be an **Indigenous manufacturer of Anhydrous Ethanol** such as sugar mills with ethanol plants, standalone distilleries producing ethanol, and complying with specifications as per IS 15464:2004. In addition to ethanol produced from SDS/molasses, the ethanol produced from other non-food feed stocks besides molasses like cellulosic and lingo cellulosic materials and including petrochemical route, shall be allowed subject to meeting the relevant BIS Standards. On November 1, 2017, the Cabinet Committee on Economic Affairs (CCEA) revised the administered price of ethanol to INR 40.85 per liter for MY 2017/18. GST and transportation	Against the requirement, quantity offered was 1.17 billion liters and of which volumes close to 807 million liters was finalized until April end. However, the actual quantity supplied until May 1, 2017 was 296 million liters. Industry estimates that 700 million should get blended by year-end. This will eventually bring down market penetration to 2 percent. The automotive industry seems to be gearing up for making vehicles compatible with the E-5 blends and will probably gear up for E-10 later. Industry sources believe that some models of two wheeler vehicles will have difficulty making their engines compatible initially. ^^ The fuel ethanol market penetration achieved was 1.9 percent. The approved price of ethanol then was INR 39/liter + applicable GST + freight but with a caveat that in case the administered price gets revised then the date for implementation will be effective in line with the PIB notification. Slab standard freight in INR/1000 liter: 1) 0 to 75 kilometers (kms): INR 100 2) 75 TO 200 kms : INR 280 3) 200 to 400 kms: INR 590 4) Above 400 kms: INR 1000 The revised price will be applicable for the same time period: Dec 1, 2017 through November 30, 2018 (PIB Press release).

	will also be paid in addition to above.	
CY 2018	A second cycle for the above tender was again floated on February 15, 2018 for supply of 1.17 billion liters of anhydrous ethanol at OMC location for period April 1, 2018 to November 30, 2018	As of June 04, 2018, against the total requirement of 3.13 billion liters, total quantity offered by suppliers was 1.76 billion liters and total quantity allocated was 1.58 billion liters of which a total 657,900 liters was actually supplied until above mentioned date. The industry believes that by the end of CY 2018, almost 1.25 billion liters is likely to be supplied. This will bring the fuel market penetration to 3.2 percent, 0.1 percent below 2016 levels.
Source: Information on procurement of ethanol for EBP was sourced from the Indian Sugar Mills Association (ISMA), New Delhi		

 # Developments in National Biodiesel Mission (NBM)

March 2017	The Cabinet Committee on Economic Affairs has approved closure/winding up of CREDA HPCL Biofuel Ltd (CHBL) and Indian Oil - Chhattisgarh Renewable Energy Development Agency (CREDA) Biofuels Limited (ICBL).	The offices of CHBL/ICBL have been closed. Joint Ventures (JV) between CREDA HPCL Biofuel Ltd (CHBL) and Indian Oil-CREDA Biofuels Limited (ICBL) were formed for carrying out energy crop (Jatropha) planting and production of biodiesel in 2008 and 2009 respectively. The CREDA, an arm of Chhattisgarh state government, had provided wasteland to CHBL and ICBL through a Land Use Agreement for planting of Jatropha. Due to various constraints such as very poor seed yield, limited availability of wasteland, high plant maintenance cost etc. the project became unviable and Jatropha production activities were discontinued.
	Per media reports, on March 18, 2017, OMCs floated a tender for procurement of around 267.3 million liters of biodiesel (B-100) for the period from April 2017 to Oct 2017. (Tender No. 1000277414 (Tender ID-22454) closing on 07/04/2017 1400 hrs.) https://bharatpetroleum.com/pdf/BIO-diesel-April-17-to-Oct-2017final-18032017-2d8d36.pdf	Indian Oil Corporation Limited (IOC), Bharat Petroleum Corporation Limited (BPC), Hindustan Petroleum Corporation Limited (HPC), and public sector enterprises invite sealed tenders under the Two-Bid System, (Technical Bid and Price Bid) from indigenous manufacturer of Biodiesel (B-100) meeting IS 15607:2016 specification Biodiesel (B-100) (Latest revision during the period of tender) to various Depots.
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	diesel	road transport corporation and port authorities had stopped buying biodiesel. Additionally a 'no input tax credit' on biodiesel is a disincentive for a few biodiesel manufacturers. Earlier there was a zero percent tax on biodiesel (CST/VAT & ED exempted in states such as West Bengal, Chhattisgarh, Uttar Pradesh, Uttarakhand, Rajasthan, and Haryana) until March 31, 2017. The first issue for the industry came when in April the government levied a 6% excise duty on biodiesel which later became 18% on the introduction of GST.
Jan 25, 2018	The OMCs floated a tender for procurement of 325 million liters of biodiesel (B100- IS 15607-2016) at OMC locations. (Tender No. 1000297106 (Tender ID-33082).	The tender closed on February 15, 2018. The bid was for an indigenous manufacturer of biodiesel who will be able to supply B100 starting March 1, 2018 through October 31, 2018. Per notification (No.6/2018- Central Tax (Rate)) from the Ministry of Finance, GOI, dated January 25, 2018, the Central tax rate on biodiesel is 6 percent. Meaning that the GST rate on biodiesel has been brought down from 18 percent to 12 percent. Biodiesel development is still in nascent stage. Commercial availability of biodiesel and its availability across major retail centers will take its own time. Biodiesel prices are set based on the Malaysian palm oil board's established price. Presently, there is no concrete information on how much biodiesel has actually been blended with diesel. Post figures are based on certain inputs and broader assumptions