

## **FAQs on 1G Bio-Ethanol**

### **1. What is 1G Bio-Ethanol and how it is produced?**

First-generation (1G) Bio-Ethanol is produced from biomass such as sugar containing materials (like sugar cane juice, molasses, sugar beet etc.) and starch containing materials (such as corn, cassava, rotten vegetables such as potatoes, damaged food grain etc.). Ethanol is generally produced from the fermentation of C5 and C6 sugars (mostly xylose and glucose) using classical or GMO yeast strains such as *Saccharomyces cerevisiae*.

### **2. What are the uses of Ethanol?**

Extra Neutral Ethanol is used for Potable purpose. Ethanol is a feedstock for Pharmaceutical and Chemical Industry. Fuel Grade Ethanol (purity > 99.5%) is used for blending with Petrol as transportation fuel.

### **3. How Ethanol blending in Petrol is beneficial?**

Ethanol is a better blend component for Petrol due to higher Research Octane Number of 108.5, which helps in improved engine power and performance. It also helps in significantly reducing other pollutants (Carbon Monoxide, Sulphur Oxides, Nitrogen Oxides, Hydrocarbon and Particulate Matter) in vehicle exhaust when compared with fossil fuels.

Lifecycle analysis (LCA) of Ethanol produced using feedstocks derived from agriculture route, indicates significant reduction in Green House Gas (GHG) emission as compared to conventional fossil fuels.

### **4. What is EBP programme?**

Ethanol Blended Petrol (EBP) programme is initiated by GoI to promote use of indigenously produced Bio-Ethanol as transportation fuel along with Petrol (Motor Spirit or Gasoline) in order to reduce Carbon Dioxide CO<sub>2</sub> emission as well as reduce import of fossil fuel.

### **5. What are the targets set under EBP Programme and current status?**

As per the National Policy on Biofuels - 2018, the EBP programme aims to achieve a blending ratio of 10% ethanol with petrol by 2021-22 and 20% by 2030, which is under review for preponing to 2025.

For further details please refer National Policy on Biofuels - 2018.

Ethanol blending percentage has increased from 1.5% in Ethanol Supply Year 2013-14 (ESY - December to November) to 5% in ESY 2019-20 (170.5 Cr. Litres) and 7.2% for present ESY 2020-21 (as on 30<sup>th</sup> March 2021).

Ethanol requirement to meet 10% EBP target for ESY 2021-22, is estimated at 412 Cr. Litres, while Ethanol availability for EBP is expected to be 360 Cr. Litres. Around 1000 crore liters Fuel Grade Ethanol is required to meet proposed 20% blending target.

**6. What is the difference between Ethanol for Potable Alcohol and Fuel Grade Ethanol for blending with Petrol?**

Extra Neutral Ethanol or Potable Ethanol has around 95% Ethanol content.

Fuel Grade Ethanol used for EBP Programme has Ethanol content more than 99.5% and should meet IS 15464:2004 specifications or revisions thereof. Fuel Grade Ethanol also contains denaturants, which makes it unfit for potable purpose.

**7. What are the steps taken by Government of India (GoI) for increasing Bio-Ethanol production in the country?**

Ministries / Departments under GoI have announced various schemes to promote Bio-Ethanol production in the country;

- \* Re-introduction of administered price mechanism;
- \* Opening of alternate route for ethanol production;
- \* Amendment to Industries (Development & Regulation) Act, 1951 which legislates exclusive control of denatured ethanol by the Central Government for smooth movement of ethanol across the country;
- \* Reduction in Goods & Service Tax (GST) on ethanol meant for EBP Programme from 18% to 5%;
- \* Extension of EBP Programme to whole of India except islands of Andaman Nicobar and Lakshadweep w.e.f. 01<sup>st</sup> April, 2019;
- \* Raw materials apart from C heavy molasses were allowed for ethanol production viz. B heavy molasses, sugarcane juice, sugar, sugar syrup, damaged food grains like wheat and rice unfit for human consumption, Surplus Rice grain available with FCI, Maize etc.
- \* Also, different ex-mill price of ethanol, based on raw material used for ethanol production, was fixed by the Government in case of sugarcane juice/sugar/sugar syrup, B heavy molasses and C heavy molasses.
- \* Department of Food and Public Distribution (DFPD) notified an Interest Subvention Scheme on 19th July, 2018 for extending financial Assistance to sugar mills for enhancement and augmentation of the ethanol production capacity. The Scheme is also extended to Grain based Ethanol production facilities.
- \* MoP&NG has also issued a 'Long Term Ethanol Procurement Policy' under EBP Programme on 11.10.2019.
- \* MoEF&CC has taken various measures which has significantly reduced average time taken in granting EC to a distillery project related to EBP Programme. Average time taken during this year has come down to about 65-70 days against the stipulated time line of 105 days.

**8. What are the byproducts of Grain Based 1G Ethanol Plant and their uses?**

Byproduct during Grain Based Ethanol production is 'Distillers Wet Grain with Soluble' (DWGS) and 'Distillers Dried Grain with Soluble' (DDGS) which is used as a feed for Cattle / other livestock.

**9. Is the technology for Grain based 1G Ethanol Production an established technology?**

Yes, there are many operating plants in India with Grain based Ethanol production. Several technology providers and plant manufacturers are available in India for setting up Grain based 1G Ethanol Plants with sufficient experience.

**10. What is Area required for 100 KL/D Grain Based Ethanol Plant?**

Plot area required to set up 100 Kilo Litres per Day (KL/D) Fuel Grade Ethanol plant is around 18 to 20 acres.

**11. What is the water and power required for 100 KL/D Grain Based Ethanol Plant?**

Typical water and power requirement for 100 KL/D Grain based Ethanol Plant is around 1000 KL/D and 3 MWh respectively.

**12. What are the benefits of supplying Ethanol for Fuel Grade blending purpose?**

Interest subvention scheme for setting up New Ethanol Plants or expansion of existing plants only for those distilleries which will supply at least 75% of Ethanol produced from added distillation capacity to OMCs for blending with petrol. The scheme has been extended for Grain based Ethanol production plants too in Dec. 2020. Under the scheme, the government would bear interest subvention for five years, including a one-year moratorium against the loan availed by project proponents from banks at 6% per annum or 50% of the rate of interest charged by banks whichever is lower. Further details may be referred from Department of Food and Public Distribution (DFPD) website.

**13. What are the feedstock which can be used for fuel grade 1G Ethanol production?**

Apart from C-heavy molasses GoI has allowed use of following for fuel grade Ethanol production - B heavy molasses, sugarcane juice, sugar, sugar syrup, damaged food grains like wheat and rice unfit for human consumption, Surplus Rice grain available with FCI, Maize etc.

**14. What is the Ethanol Price offered by PSU OMC for EBP Programme?**

Ethanol prices are announced by PSU OMC every year before start of ESY depending on the feedstock being used for production of Ethanol.

From ESY 2020-21 two new feedstocks i.e. Surplus Rice & Maize have been added and the Prices of various feedstock have been revised upward as below:

<b>Feed Stock</b>	<b>ESY 20-21 (₹/Ltr.)</b>	<b>ESY 19-20 (₹/Ltr.)</b>	<b>Change</b>
SCJ (Sugarcane Juice / Sugar Syrup / Sugar)	62.65	59.48	5.3%
BHM (B-Heavy Molasses)	57.61	54.27	6.1%
CHM (C-Heavy Molasses)	45.69	43.75	4.4%
SR (Surplus Rice)	56.87	NA	NA

DFG (Damaged Food Grain)	51.55	50.36	2.3%
Maize	51.55	NA	NA

The above price is excluding the applicable taxes and transportation cost. Transportations rates are also fixed depending on the distance and are revised at regular interval.

### 15. What is procedure followed for procurement of Ethanol for EBP Programme by PSU OMCs?

Based on Long term procurement policy, Ethanol producers, who are interested in supply of Ethanol to OMCs are registered with OMCs for a 5 year period (Dec 2020 to Nov 2025). Once registered, they need not submit documents again and again for every tender. They have to offer ethanol quantity at a published rate whenever there is a requirement of OMCs. Registration is done at regular intervals. Central Procurement Organisation - Marketing (CPO-M), BPCL is the nodal agency for ethanol procurement process on behalf of OMCs.

OMCs release quantity bids for requirement of each location (Total of all three OMCs in a location).

Price of Ethanol and transportation rates are published by OMCs.

Rates for Ethanol from different feed stock for ESY 2020-21 are as below.

Raw material	Rate (₹ / Litre)
SCJ (Sugarcane Juice / Sugar Syrup / Sugar)	62.65
BHM (B-Heavy Molasses)	57.61
CHM (C-Heavy Molasses)	45.69
DFG (Damaged Food Grains)/Maize	51.55
SR (Surplus Rice)	56.87

Revised Rates for Ethanol Transportation w.e.f. 1<sup>st</sup> April 2021 are as follows;

Distance Slab (Kilometers)	Previous rate (₹/KL)	Revised rate (₹/KL)	% increase
0 to 75	155	160	3.04%
>75 to 200	339	359	5.85%
>200 to 400	721	763	5.85%
>400 to 600	1209	1279	5.76%
>600 to 800	1697	1795	5.75%
>800 to 1000	2184	2309	5.74%
>1000 to 1200	2904	3057	5.28%
>1200	2904 + 2.09 for addl KM beyond 1200 KM	3057 + 2.23 for addl KM beyond 1200 KM	

Note: Rates are subject to be review and revision at regular interval.

Ethanol Producers are required to offer quantity from different feed stock against each location.

Allocation is done as per priority of feed stock and distance as stipulated in the tender.

Allocation is done first within the state. i.e., for requirement of a particular state from suppliers having plants within that state. After exhausting the ethanol available within the state allocation is done for inter-state supplies.

Quantity bids are also invited at regular intervals as per requirement.

After allocation is done, individual OMCs will take management approval for placing Purchase Order.