Twitter Thread by The Tycoon Mindset



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Roadmap for Ethanol blending In India 2020-25:

Decoding the opportunities in Ethanol Blending in India and how certain sector can benefit out of it.

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Data-facts:
• 98% of India fuel requirement in road transportation is met through fossil fuel.
• Bio fuels only consist about 2% of use for road transportation.

• Ethanol is the important part of biofuel. It is naturally produced from fermentation of sugar by years or via petrochemical process such as ethylene hydration.
• Combined ethanol distillation capacity of India is 684 crore litres

There are different types of Ethanol variants:
1. E-10: In this, 90% of usage is gasoline & 10% Ethanol.
2. E-10 is maximum used in India.
E-20:
3. In this, 80% of usage is gasoline & 20% Ethanol.

The calorific value of ethanol is around 2/3rd of gasoline

Recent Target Improvements:

• National Policy for Biofuel has increased the target of Ethanol Blending to 20% from 10%
• With low quantity around 50% of petrol sold is E10 blended & rest is unblended(E0).
• Current level of Ethanol blending is ~7-8%, & 10% is expected by 2022

Ethanol Industry Size:

• Global production of fuel ethanol touched 110 Bil. Ltrs in 2019, growing at CAGR 4% from last decade.
• USA & Brazil contributes 92 Billion Ltrs (~84% share). Rest is contributed by Europe, China, India, Canada & Thailand.

Ethanol Supply and Blending Trends						
Year	Qth Supply (In cr Ltr)				Total	Blending %
	C-Heavy	B-Heavy	Sugarcane	Maize		
2014	38	-	-	-	38	1.53%
2015	67.4	-	-	-	67.4	2.33%
2016	111.4	-	-	-	111.4	3.51%
2017	66.5	-	-	-	66.5	2.07%
2018	150.5	-	-	-	150.5	4.22%
2019	145.8	33.3	-	9.5	188.6	5%
2020	74.12	68.14	14.83	15.95	173	5%
2021	136	132.8	30	33	332	8.50%

There has been constant increase in Ethanol Supply and Blending Trends. In past 2 year we have seen massive shift in C-Heavy Molasses to B-Heavy Molasses.

Read about B-Heavy & C-Heavy Molasses here.

https://t.co/T3PwQyaRBQ

> Molasses are of different types of boiling.
>
> A. C-Heavy Molasses: 3 Times of Boiling of Sugarcane Juice is C-Heavy Molasses. Content:
>
> 1 Ton of Sugar= 9.5-13% Sugar + 4-5% Molasses + 30% Bagasse + Rest Water)
>
> — The Tycoon Mindset (@tycoonmindset05) June 28, 2021

Reason behind increase in B Molasses:

Sugarcane price is the highest for ethanol(Rs 62.3). Sugar companies priority is to manufacture sugar. Hence there won't be much traction here (entire shift to ethanol), while the price difference between B-Molasses and Sugarcane is only Rs5

Table 4.1: Feedstock cost and ethanol yield

Feedstock	Cost / MT of the feedstock (Rs.)	Quantity of ethanol per MT of feedstock	Ex-mill Ethanol Price (Rs./litre)
Sugarcane juice / Sugar / Sugar syrup	2850 (Price of sugarcane at 10% sugar recovery)	70 litre per ton of sugarcane	62.65
B Molasses	13,500	300 litre	57.61
C Molasses	7123	225 litre	45.69
Damaged Food Grains (Broken Rice#)	16,000	400 litre	51.55
Rice available with FCI	20,000	450 litre	56.87
Maize#	15,000	380 litre	51.55

#The rates vary from region to region and also in accordance with demand/supply or quality.

'B' and 'C' molasses has price difference of Rs 12. The production cost from 'B' to 'C' molasses is not that significant, with respect to price gain of Rs12. Hence the production of ethanol has been shifted from C-Molasses to B-Molasses

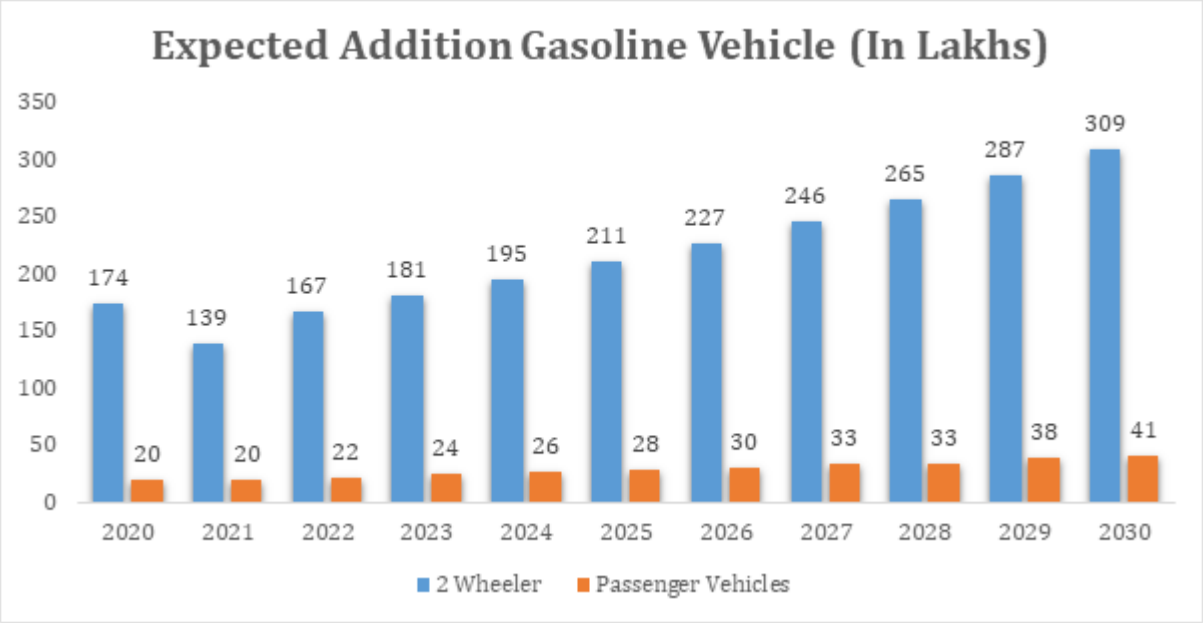
GST on Ethanol:

- GST on C Molasses- Rs 3.13
- GST on B Molasses- Rs 2.28
- GST on Petrol- Rs 33

Vehicles Trend in India

The gasoline vehicles (2 wheelers & 4 wheelers) in the country can be tuned to suit ethanol blended fuels ranging from E0 to E5 depending on the vehicle type. On material front the rubber and plastic components are compatible with E10.

However government has targeted E20 (80% gasoline and 20% Ethanol) for which there would be need of both vehicles and material advancement. Government expect gasoline vehicles to increase by 6% every year till 2030



Society of Indian Automobile Manufacturers have assured government with the availability of making of E10 & E20 base vehicle, with increase in Ethanol blending.

Table 3.1. Emission reduction potential of ethanol-gasoline blends [8]

Emissions	Gasoline	Two-wheelers		Four-wheelers	
		E10*	E20*	E10*	E20*
Carbon Monoxide	Baseline	20% lower	50% lower	20% lower	30% lower
Hydrocarbons	Baseline	20% lower	20% lower	20% lower	20% lower
Oxides of nitrogen	Baseline	No significant trend	10% higher	No significant trend	same

* E10 project was carried out in 2009-10, E20 project in 2014-15. Hence, the test vehicles were not the same. However, the emission trend is similar.

Pricing of E20 Vehicle:

The cost of E20 compatible vehicles is expected to be higher in the range of Rs 3,000 to Rs 5,000 for four-wheeler and Rs 1,000 to Rs 2,000 for two-wheeler, over and above the cost of ordinary vehicles tailored to run on 100% gasoline.

Government Ambition towards Pollution control:

With usage of Ethanol based petroleum, there is expectation of decline in Carbon Monoxide and Hydrocarbons.

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However it has certain impact on fuel efficiency as well:

A. 6-7% for 4 wheeler designed for E0 and calibrated for E10
B. 6-7% for 4 wheeler designed for E0 and calibrated for E10
C. 1-2% for 4 wheeler designed for E10 and calibrated for E20

Global Companies for Ethanol Blending:

Brazil continuous the mandate for blending of 18-27.5% of ethanol in Gasoline, which was started in 2015. US and EU in their Renewable Fuel policy also started with the ethanol blending.

In India Ethanol blending policy has been brought up a decade ago, but with no implementation on ground level. Now that government is serious on increase national bio fuel, the policy can be favourable for short period.

Table 2.1: Roadmap / Mandate for ethanol blending in various countries

Country	Roadmap / Mandate for ethanol blends	Program	Implementation by	Vehicle Type
Brazil [2]	National policy of Brazil continues the mandate for blending of 18-27.5% of ethanol in gasoline which originally started from 2015. This is currently at 27%.	National biofuels policy (Dec 2017)	Ministry of mines and energy (MME)	Mainly flex. Motorbikes and other two wheeler engines use E27
United States [3]	The clean air Act requires EPA to set the Renewable Fuel Standards (RFS) volume requirements annually. EPA updates volume requirements each year based on fuel availability.	Renewable fuel standard (RFS) program	Environmental protection agency (EPA)	Primarily normal; Flex for E30 or E85 only.
European Union (EU) [4]	EU aims to have 10% of the transport fuel of every EU country come from renewable sources, such as bio-fuels by 2020	Renewable energy directive	European commission	Flex and normal
China [5]	In September 2017, the Chinese government announced legislation proposing the use of ethanol in fuel for all of China with the target of 10% ethanol blending.	Fuel quality standards	National energy administration	Primarily normal
Thailand [6]	Alternative Energy Development Plan (ADEP) targets the share of renewable and alternative energy from biofuel to increase from 7% of total fuel energy use in 2015 to 25% in 2036	ADEP	Ministry of Energy	Primarily normal

Flex Fuel:

Brazil has continuously adopted flex fuel which run on more than 1 fuel blended with ethanol or methanol, stored in common tank.
Brazil represents over 80% of total number of new vehicles sold in country. Flex fuel vehicles used in Brazil operate with E27 to E100.

Government target for Ethanol Blending:

Govt. has targeted to generate ethanol blending of 550cr ltr from sugar & 466cr ltr from Grain.
Govt. is also targeting for other crops than sugar, as it is environmental costly crop, because it requires much higher amount of water.

Government Ethanol Blending Target						
Year	Est. Petrol Sales (MMT)	Est. Petrol Sale (Cr)	Blending	Est Ethanol Blending (Cr Litre)		
				Grain	Sugar	Total
2020	24.1 (Actual)	3413 (Actual)	5%	16	157	173
2021	27.7	3908	8.50%	42	290	332
2022	31	4374	10%	107	330	437
2023	32	4515	12%	123	425	542
2024	33	4656	15%	208	490	698
2025	35	4939	20%	438	550	988
2026	36	5080	20%	466	550	1016

Water Cost in Sugar:

1 tonne of sugarcane produce 100kg of sugar, & 70 ltr of ethanol.
Cultivation of 1kg of sugar requires 1600 to 2000 ltr of water. Hence, 1ltr of ethanol from sugar requires about 2860ltr of

water. Sugarcane & paddy use around 70% of irrigation water of India

Sugar blending target is expected to increase 2.5x in next 5yr, while grain target is expected to increase 30x in next 5 year. Government target is to generate 1,016 cr litre ethanol blending till 2026. While rice is also expected to be next priority crop for ethanol blending.

Additional Capacity Required for Blending Target:

As per government report, India will be required additional capital of 1,500 cr ltr till the next 5 year for coming to this Ethanol Blending Target.

Additional Capacity Requirement (In Cr Ltr)			
Capacity Required	**Grain**	**Sugar**	**Total**
2020	258	426	684
2021	260	450	710
2022	300	519	819
2023	350	625	975
2024	450	725	1175
2025	700	730	1430
2026	740	760	1500

For the estimated ethanol supply of 1350cr ltr, there would additional capacity of 723 cr ltr required to meet the target.

Government is targeting to add 241 molasses based and 482 grain based capacity for ethanol blending for this capacity augmentation.

Estimated Expansion Amount			
Ethanol Supply in 2025-26 (In Cr Ltr)			
Ethanol Supply	**Fuel ethanol**	**Other Uses**	**Total**
From sugar	550	134	684
From Grain / Maize	466	200	666
Total Supply	1016	334	1350
Capacity Augmentation			
Ethanol Capcity (In Cr Ltr)	**Molasses based**	**Grain Based**	**Total**
Existing Ethanol Capcaity	426 (231 distilleries)	258 (113 distilleries)	684
Capacity Additon from Project	93 (March 2022)	0	93
New Capcacity	241	482	723
Total Capacity Required by 2026	760	740	1500

Note: 1. Molasses based distilleries can produce 20% additional ethanol from B-Heavy Molasses

Ethanol Blending Policy:

For this project, government has eased the norms of Environmental Clearance. After preparation of EIA report based on

ToR, it is submitted to SPCB. SPCB further writes this to District Collector with takes 2-4 months.

Further application of EC approval is submitted to MoEF & CC/SEIAA and the permission is granted by them.

These whole activity take now atleast 10 months which previously used to take around 1.5-2 year.

Driving Factors for Ethanol:

A. Demand Enrichment: Increasing minimum blending percentage, & adopting E20 blending
B. Supply Enrichment: Schemes for ethanol production, thereby fulfilling gap of demand & supply.
C. Incentives to manufacturer Ethanol Blending to the sugar mills

Outlook:

Ethanol Policy drive benefit to sugar companies as government are incentivizing sugar mills to produce ethanol.

This will stabilize the demand – supply gap in sugar industry, and government expenditure to protect sugar mills and farmer's income will be reduced.

Other focus area to look at is the rice and grains manufacturers, as the ethanol blending base is very low. Hence ethanol blending target for rice manufacturers is targeted to be 36x in next 5 year.

However not all the rice manufacturers will get benefit as the cost of ethanol from rice doesn't yield higher margins. While currently the MSP in rice has been increased. Certain rice manufacturers has ethanol blending cost higher than ethanol price announced by government.

As mentioned by government, the blending target from crops can be change. Hence there is even possibility of shifting the grain based ethanol to sugar based ethanol.

How long will this theme survive?

1. Until the price of ethanol are sustainable:

GST in Petrol from ethanol is only 2-3 ltr. Hence govt. source of revenue will be decreased.
With ethanol blending of 332cr ltr, revenue loss to the government amounts to Rs. 10,950 crore per annum

2. Every sugar players are increasing the capacity. Over years, as the capacity increases, supply will increase. This will eventually again exceed the demand.

3. If government increase the ethanol blending target post 2025 these theme may again work, which even has higher possibility.

As an investor one has to enter companies which has sustainable BS, good Corporate Governance, and to stay in the ride of industry tailwind, until the theme is sustainable. Upcoming supply is expected to take atleast 1-2 year, until when there

can be few sustainable years.

Industry figures (on production and supply of sugar) should be in consistent watchlist. Government measures should be tracked properly.

While for filtering companies in sugar sector, you can refer to our previous thread.

https://t.co/aJTFeO91tt

> Filters:
> 1. Average Capacity Utilization of Company
> 2. Yield per Tonne. Higher the yield will have higher margin
> 3. Ethanol facility per tonne of cane crush.
> 4. D/E of the company. (Higher D/E will have priority of debt repayment first. Hence there is no scope for dividend)
>
> — The Tycoon Mindset (@tycoonmindset05) June 28, 2021