Ethanol Blending Programme Development & Future Prospects Indian Perspective

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India's Energy Demand and Need For Alternative Biofuels

India is the world's third largest energy consuming Nation.

A significant part of India's energy requirement is met through imported fossil fuels.

India's share in global energy consumption is set to double by 2050.

A rising energy demand and high reliance on import poses significant energy security challenges.

India's Energy Demand and Need For Alternative Biofuels Contd.

As per the updated NDC submitted to UNFCCC in August 2022, India stands committed to –

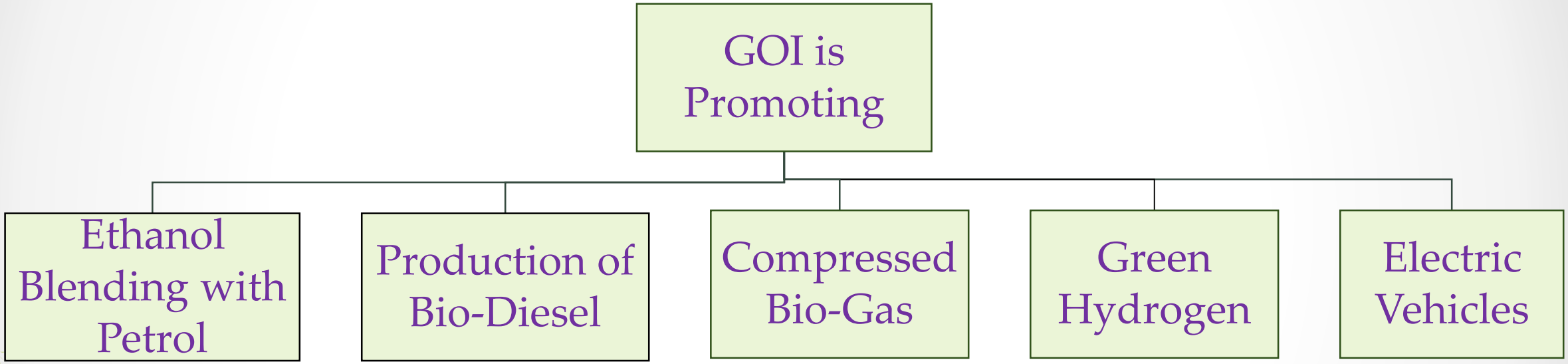
- Reduce Emissions Intensity of its GDP by 45 percent by 2030, from 2005 level.
- Achieve 50 % cumulative electric power capacity from non-fossil fuel-based energy resources by 2030.

India's Step Towards Achieving the Goals

To achieve the above goals following biofuels and alternative sources of energy are available:

- Ethanol
- Bio-Diesel
- Compressed Bio-Gas
- Green Methanol
- Green Hydrogen
- Non fossil fuel based electricity like Hydel, Solar, Wind, Tidal and Nuclear

India's Step Towards Achieving the Goals Contd.



Among The biofuels Ethanol Blending with Petrol is the first Choice

Ethanol Blending Programme in India

Based on following merits Ethanol is considered most promising biofuel that can easily be used by mixing with petrol :

- Ethanol not only replaces the quantity of petrol but being an oxygenate fuel, also improves the energy efficiency of Engine (By clean burning of Petrol). 20 % blend of Ethanol reduces 50 % Carbon monoxide and 20 % hydrocarbon emissions in two wheelers and 30 % Carbon monoxide and 20 % hydrocarbon emissions in four wheelers.
- Each liter of Petrol replaced with Ethanol saves 2.3 kg of CO_2 emission.
- Ethanol being derived from agricultural sources has great potential to improve rural economy.
- Since the Ethanol is locally produced and blended it also saves huge emission arising out of extracting crude petroleum, transport and refining process etc. apart from direct saving of emission as stated above.
- Easy process of handling, transportation and storage.

Ethanol Blending Programme in India Contd.

In India EBP was started in the year 2003

Subsequent to introduction of National Biofuel policy 2018, no. of encouraging initiatives on EBP Programme, no. of amendments were done in Acts like Cane Control Order 1966, IDR Act, EIA Notification 2006 to make the program successful.

Several Changes were also done in procurement process of Ethanol by OMCs.

Financial assistance in the form of Interest subvention on term loan were extended by GOI for speedy enhancement of production capacity of Ethanol.

Parallel to these amendments, a target for 10 % ethanol blending by 2022 and 20 % Ethanol blending by 2025-26 was also fixed.

Ethanol Blending Programme in India Contd.

Flex fuel vehicles manufacturing has started from current year.

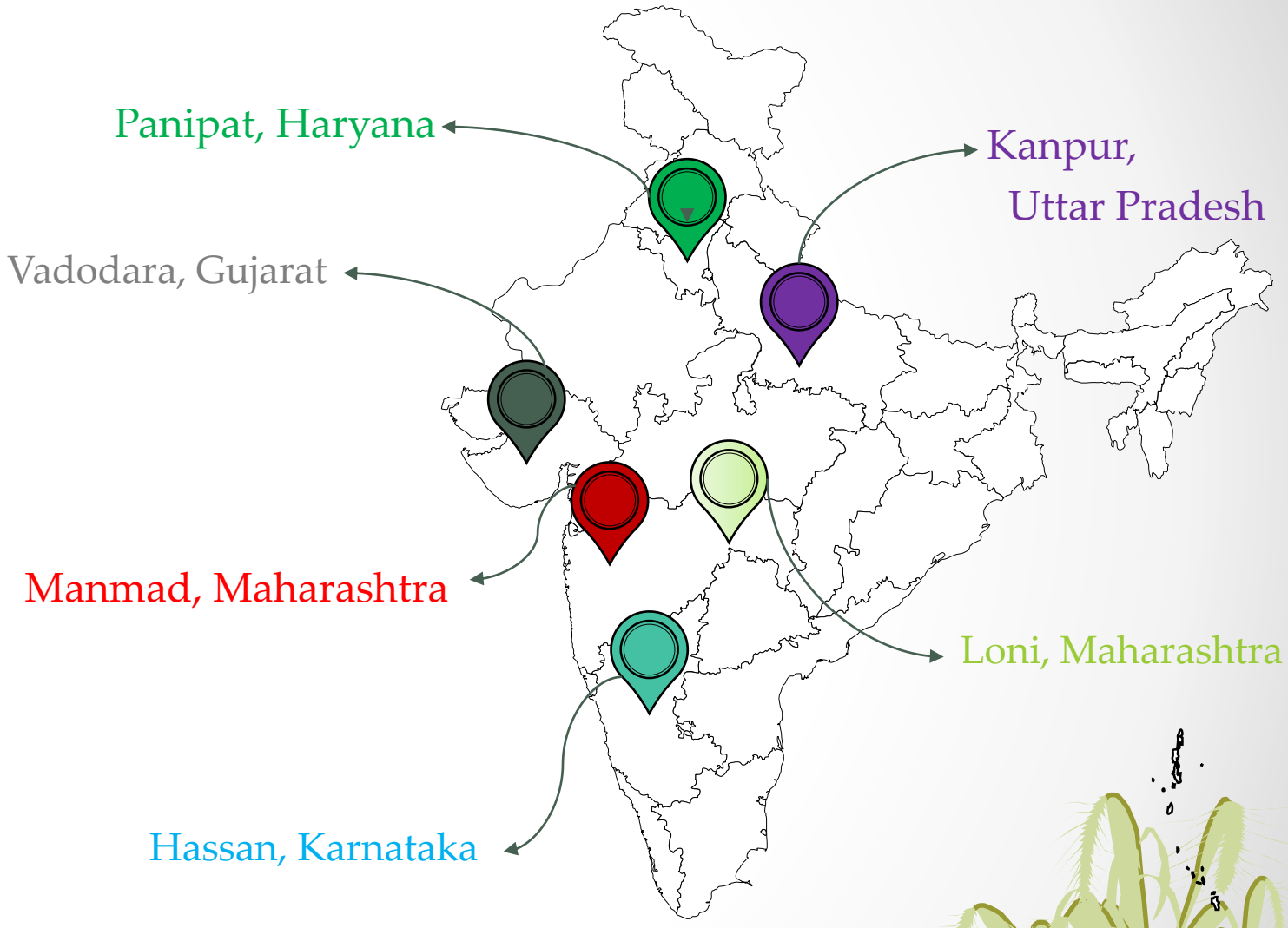
Development on Infrastructure for Distribution and Dispensing of Ethanol by Oil Marketing Companies:

a. Logistic improvement by OMCs

b. Dispensing facilities of E 20 petrol at selected outlets.

LOGISTIC IMPROVEMENT BY OMCs:

OMCs have started rack loading facilities at six railway stations for Ethanol transportation from major Ethanol producing states to far off deficit states like J&K, North east states, Kerala etc.

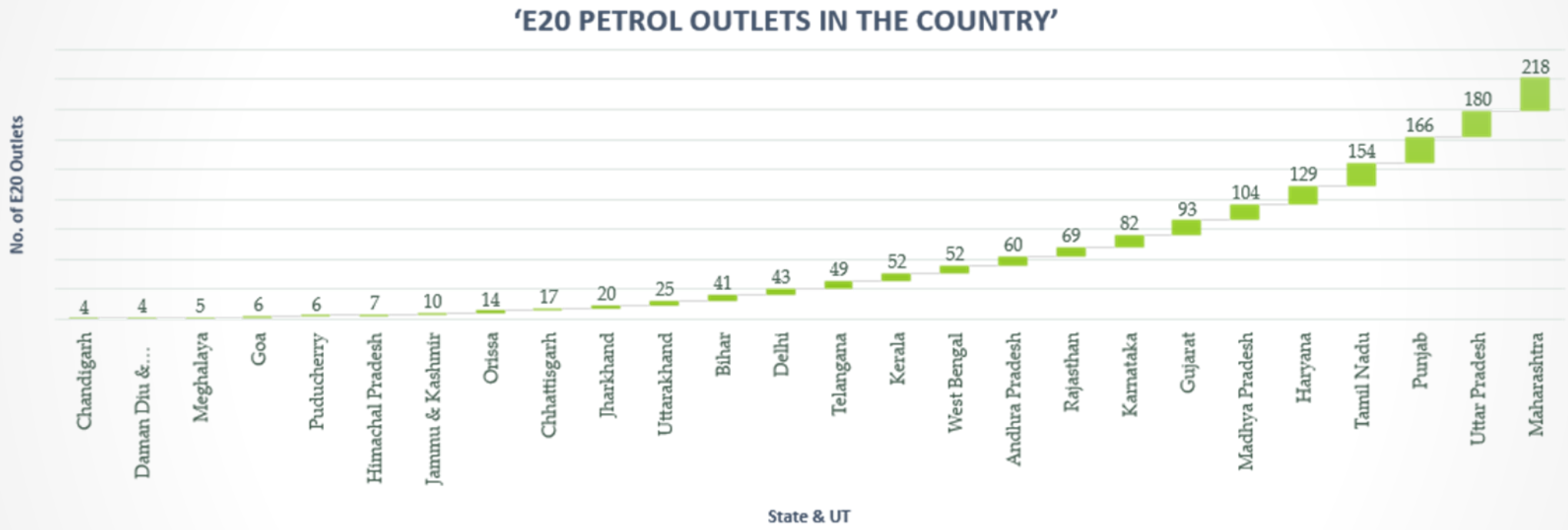


LOGISTIC IMPROVEMENT BY OMCs CONTD.

Pipeline Transportation of EBMS (Ethanol Blended Motor Spirit) is being carried out at :

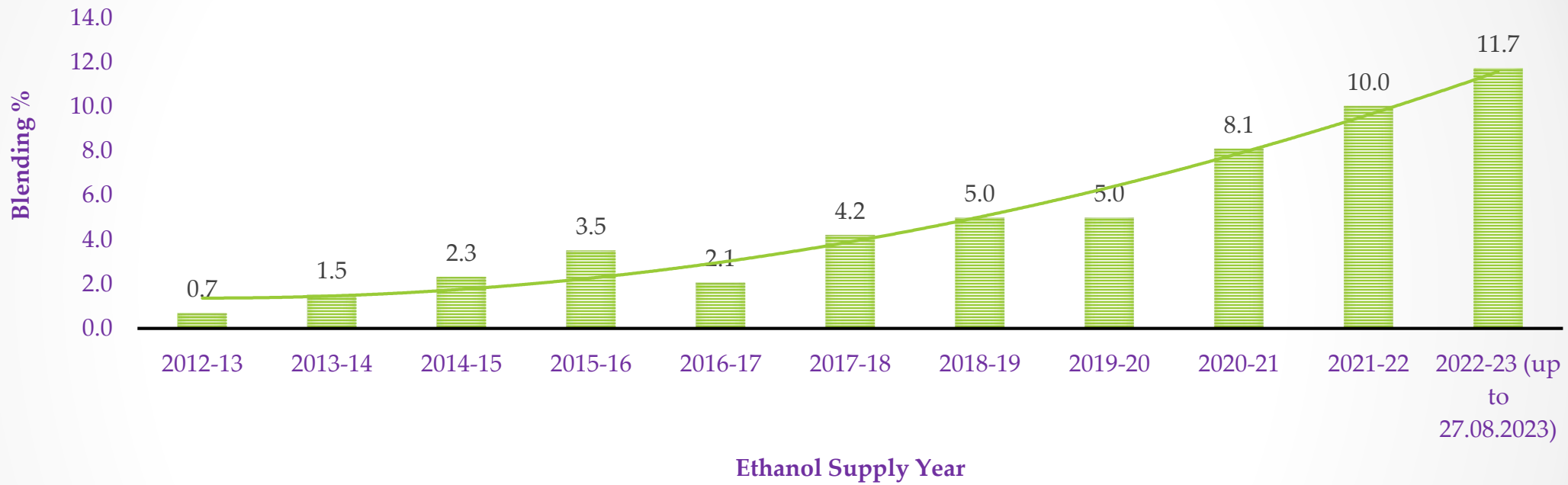
- Mathura-Agra
- Koyali-Dumad
- Panipat-Rewari

OMCs HAVE STARTED SELLING E20 BLENDS ON SELECTED OUTLETS TO ACHIEVE BLENDING BEYOND 10 %



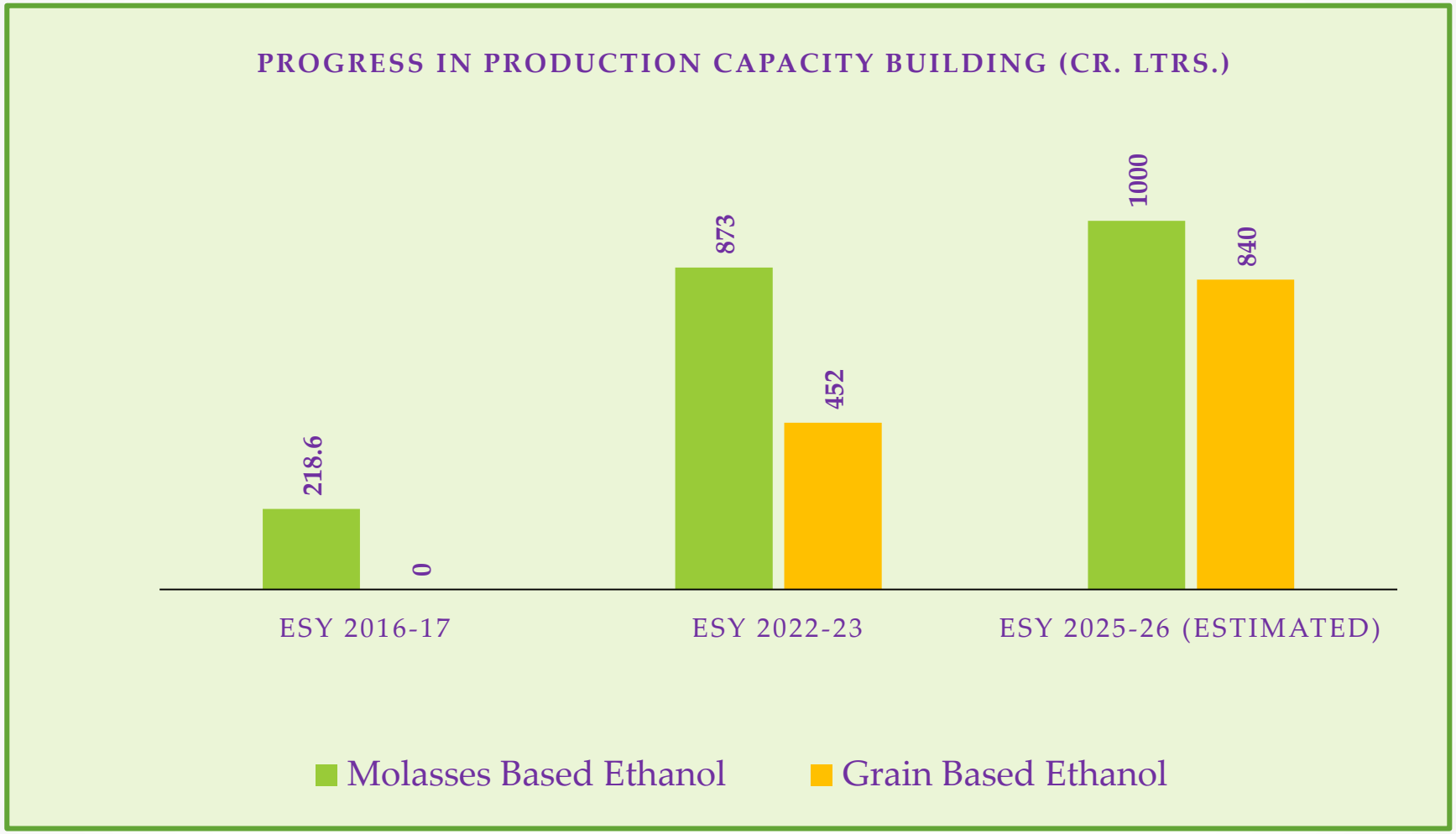
Outcome of the Schemes

Progress of Ethanol Blending Programme



Around 413.49 Crore liters of ethanol has been supplied in ESY 2022-23 up to 27.08.2023, resulting in an 11.70% blending rate, which is close to the set target for the current ESY.

Progress in Capacity Enhancement of Ethanol Production



Way Forward

1st Generation Ethanol:

- 1st Generation Ethanol is produced from Sugar and Starch containing raw materials such as Sugarcane Juice, Molasses, Sugarbeet, Rice, Corn, Cassava etc.
- Area under cultivation of Cane and Paddy has been almost fully explored.
- We need to move forward on cultivation of Maize which GOI is promoting.
- Further work is needed on development of suitable varieties of Sweet Sorghum and process optimization for Ethanol production from Sweet Sorghum juice.

Proposed Way Forward Contd.

2nd Generation Ethanol:

- 2 G Ethanol is produced from agri-residues like rice & wheat straw, Corn cobs, Bamboo, bagasse etc.
- The technology for production of 2 G Ethanol has now been developed and four plants of 100 KLPD capacity each are being installed at Panipat refinery Haryana, Bhatinda Refinery Punjab, Bargarh Orisa and Numbalgarh Assam. Panipat refinery has completed it's trial run. The commercial data are yet to come.

Contd.

- 2 G Ethanol technology is in it's infancy. More work needs to be done to have fully developed commercially viable technology and utilize the full potential of 2G Ethanol production.
- To promote 2 G Ethanol production, Government of India had launched "Pradhan Mantri JI-VAN (Jaiv Indhan - Vatavaran Anukool fasal awashesh Nivaran) Yojana" in March, 2019 for providing financial support for setting up Second Generation (2G) ethanol projects in the country. The total financial outlay for the scheme is Rs. 1969.50 crore for the period from 2018-19 to 2023-24.
- A 100 KLPD bio-refinery requires approximately 2 Lakh Metric Tons (LMT) of biomass per annum. As against this, the total availability of Paddy straw in the States of Punjab, Haryana and Odisha is approximately 260 LMT and the availability of bamboo in North East Region is approximately 500 LMT as per the crop production statistics of these states.

Way Forward Contd.

3rd Generation Ethanol:

- Ethanol is produced from algae substrate and industrial waste gases containing CO2, CO, CH4 etc. are categorised as 3 G Ethanol.
- India would be able to produce 40-50 KMTA of ethanol per refinery while saving about 1 million tonnes of CO2 per annum. This is the equivalent emissions savings as taking 8.5 lakh cars off the road in India.
- One 3G Ethanol plant of 128 KLPD has been installed at Panipat refinery of IOCL where 90 KL per day has been started from off gases of the refinery.

Contd.

- As per current total capacity of refineries there is potential of 60 – 62 cr. lits. production of ethanol per annum from oil refineries.

- Such off gases are also available in other industry like blast furnace of Iron & Steel industry. There is need to explore the possibilities of recovering Ethanol from such Industries.

Thank You

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