

AFTER E20

India's Ethanol Blending Programme: Cost, Capacity and the Next Phase

Professional source-based report from CEEW analysis

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India achieved **20% ethanol blending** in petrol in **March 2025, five years ahead of target**. CEEW's analysis examines what comes next as India considers **E85** and **E100** flex-fuel vehicles, with particular attention to **public expenditure**, feedstock costs, petrol demand, **electric-vehicle adoption**, and **food and water security**.

Key Indicators

Indicator	CEEW / cited figure
E20 milestone	20% blending achieved in March 2025
2025 ethanol demand	~1,016 crore litres
Potential 2028 demand	~1,600 crore litres
Installed ethanol capacity	~1,700 crore litres
ESY 2024-25 OMC procurement cost	₹62,566 crore
Estimated true public cost	₹87,390 crore
Additional public expenditure / foregone revenue	~₹24,824 crore
Petrol demand outlook	~5,700 crore litres by 2032; ~3,700 crore litres by 2050

1. From E20 to Higher Ethanol Blends

India's Ethanol Blending Programme has helped build a domestic fuel source and an additional market for sugarcane, maize and surplus rice. According to government figures cited by CEEW, the programme has substituted about **270 lakh metric tonnes** of imported crude oil, saved roughly **₹1.59 lakh crore** in foreign exchange, and paid **₹1.18 lakh crore** to farmers.

The next phase is structurally different. In **April 2026**, **MoRTH** released a draft notification to recognise flex-fuel vehicles running on **E85** and **E100**, and around **48 public-OMC retail outlets** began rolling out **E85** in **June 2026**. Existing **E20-compatible vehicles** cannot use **E100** without changes to engine calibration and fuel-system components.

2. Demand Growth and Stranded-Capacity Risk

CEEW estimates that if E20 continues and flex-fuel vehicles reach **20% of new vehicle registrations** by 2028, ethanol demand could increase from around **1,016 crore litres** in 2025 to about **1,600 crore litres** in 2028, an increase of **more than 50%**. Current installed production capacity of about **1,700 crore litres** could theoretically meet near-term demand.

Longer-term demand is less certain. CEEW's transport modelling suggests petrol demand could peak at roughly **5,700 crore litres by 2032** and decline to about **3,700 crore litres by 2050** as electric vehicles gain share. Because ethanol plants typically operate for **20-30 years**, capacity built now could face a shrinking market and **stranded-investment risk**.

3. The True Public Cost of Ethanol

CEEW argues that OMC procurement prices do not capture the programme's full fiscal cost. When feedstock subsidies, electricity subsidies, fertiliser subsidies and foregone GST revenue are included, the estimated true cost for **ESY 2024-25** rises to approximately **₹87,390 crore**, compared with an OMC procurement cost of **₹62,566 crore**. The gap of about **₹24,824 crore** represents additional public expenditure or foregone revenue.

Fertiliser and electricity subsidies account for approximately **46%** of this additional outlay. If ethanol demand rises to **1,600 crore litres by 2028**, CEEW estimates additional public expenditure or foregone revenue of roughly **₹38,226 crore**, before any future increase in procurement costs.

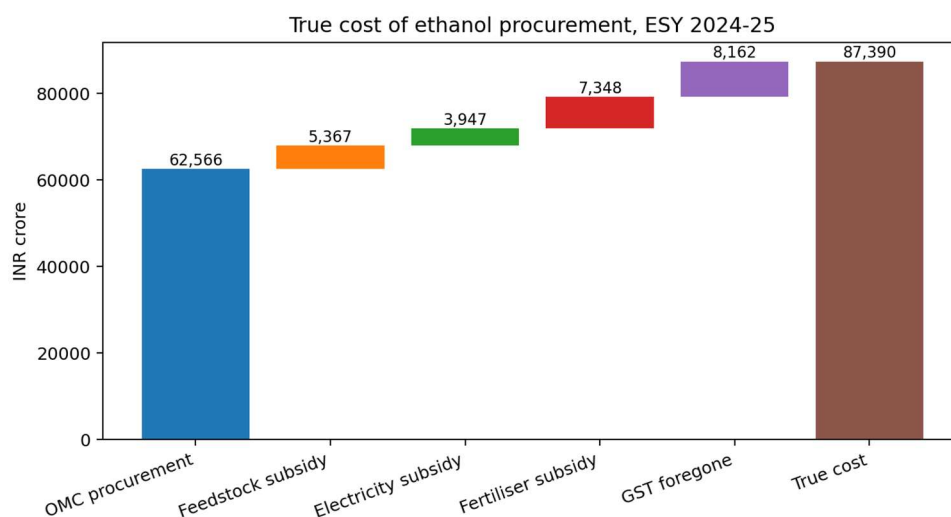


Figure 1. Recreated from CEEW's stated cost components: estimated true public cost of ethanol procurement, ESY 2024-25.

4. Feedstock Economics

Feedstock selection materially changes the fiscal footprint. CEEW estimates a true cost of about **₹126 per litre** for rice-based ethanol and **₹95 per litre** for maize-based ethanol. Sugarcane juice and B-heavy molasses are lower at approximately **₹85.5** and **₹71.7 per litre** respectively.

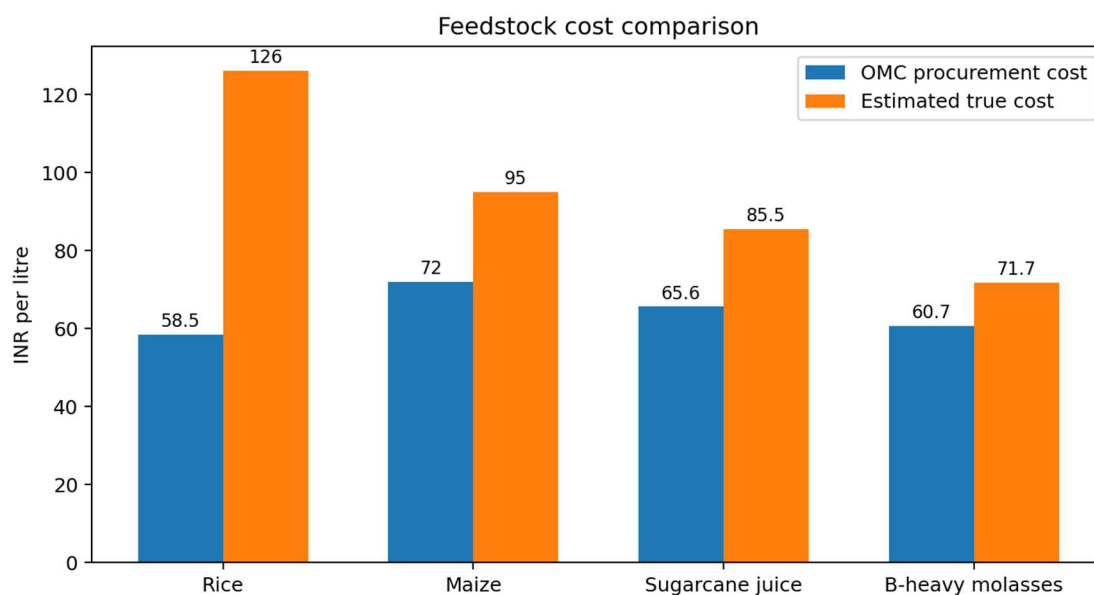


Figure 2. Recreated from CEEW's feedstock cost figures, comparing OMC procurement cost with estimated true cost.

5. Flex-Fuel Vehicle Economics

Ethanol has about **28% lower gross calorific value** than petrol. CEEW notes that vehicles running on ethanol typically deliver **20-25% lower fuel economy** per litre. Its 2028 four-wheeler TCO analysis found petrol **2-14% cheaper** than E100 at current retail prices, around **15% cheaper** at OMC procurement prices, and **15-25% cheaper** when ethanol is valued at its estimated true cost.

For flex-fuel vehicles to reach cost parity, CEEW estimates ethanol would need to retail at roughly **₹52-₹73 per litre** across states, below the assessed production cost of commercially viable feedstocks. A **20% flex-fuel market share** in the petrol segment could require an additional **₹3,500 crore** to bring TCO to parity with standard petrol cars.

6. Food, Land and Water Security

India's programme still relies predominantly on **first-generation feedstocks** such as sugarcane, rice and maize. CEEW warns that higher blends could intensify pressure on **food systems, land use and water resources**.

- In ESY 2024-25, about **52 lakh metric tonnes** of surplus FCI rice were allocated for ethanol production, according to figures cited by CEEW.
- During the 2025-26 kharif season, maize cultivation increased by roughly **9 lakh hectares** while oilseed area declined.
- CEEW cites water requirements of about **210 litres per kilogram** for sugarcane and about **500 litres per kilogram** for maize, highlighting the importance of regional water stress in feedstock planning.

7. CEEW's Recommended Planning Priorities

- Publish annual estimates of the programme's **full public expenditure**, including procurement costs, feedstock/fertiliser/electricity subsidies and foregone tax revenue.
- Periodically **reassess feedstock incentives**, with closer scrutiny of **rice-based ethanol** because of its estimated true cost and food/water implications.
- Redirect part of the savings from rationalising grain-based support toward **second-generation ethanol** from agricultural residues.
- Address 2G barriers in **cellulosic conversion technology, biomass aggregation** and logistics, while using the **IOCL Panipat plant** as a learning platform.
- Align future ethanol capacity with **petrol-demand projections** and **electric-vehicle adoption** rather than assuming liquid-fuel demand will rise indefinitely.

Conclusion

CEEW describes India's Ethanol Blending Programme as a **genuine success** in energy security and rural economic development, while arguing that the **post-E20 phase** requires more explicit accounting of **fiscal costs and trade-offs**. Its central recommendation is to coordinate ethanol capacity with **future petrol demand and EV adoption**, while reassessing feedstock support against **food security, water use and fiscal objectives**.