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Project Appraisal and Monitoring Services
Ethanol Industry
India's Ethanol Ascent: Fuelling the Next Phase of Green Growth

About Us

Resurgent India Ltd. is a top-tier financial advisory firm and a Category I Merchant Banker, serving SMEs, large corporates, and government bodies. Our services span Techno-Economic Viability (TEV) studies, Lender's Independent Engineer (LIE) assessments, Agency for Specialized Monitoring (ASM), Detailed Project Reports (DPRs), and Due Diligence assignments. We also support clients through specialised practices in Debt Syndication, Capital Markets, and Valuations, alongside Investment Banking and NBFC Advisory. In addition, we provide Stressed Asset Advisory, Insolvency (IBC) Services, Corporate Legal Services, ESG Advisory, Government Advisory, FinTech Solutions, and Training, enabling clients to access a complete suite of financial and strategic solutions.

Our Project Appraisal and Monitoring vertical provides independent assessments of project viability along with reports that assist in both pre- and post-disbursement decision-making for lenders. We have delivered over 1,500 Techno-Economic Viability (TEV) studies and more than 500 Lenders' Independent Engineer's (LIE) reports. Furthermore, Resurgent India is empaneled with nearly all public sector banks, several private banks, and NBFCs for LIE and TEV studies, and with the Indian Banks' Association (IBA) as an Agency for Specialised Monitoring (ASM). With over 20 years of experience and our team of experts, including engineers, chartered accountants and industry specialists, we have successfully handled numerous assignments in TEV in various sectors like Agriculture, Logistics, Packaging, Education, FMCG, Textiles, Real Estate, Solar Power, Chemicals, Pharmaceuticals, Infrastructure, Healthcare, Hotel, Ethanol, Iron & Steel etc.

Ethanol Industry: Fuelling the Next Phase of Green Growth

India's ethanol sector has emerged as a key pillar of the country's energy transition strategy, supported by a strong policy framework, diversified feedstock base, and expanding production capacity. The sector plays a critical role across three strategic priorities — energy security, agricultural income support, and decarbonisation — thereby presenting a structurally favourable opportunity for lenders and investors.

At the global level, the ethanol market is estimated at approximately USD 94–100 billion in 2024 and is projected to grow to USD 160+ billion by 2032, implying a CAGR of ~7% (as per industry estimates). The United States and Brazil together account for nearly 80% of global production, with blending mandates across more than 60 countries ranging between 5% and 27%.
(Source: MoPNG/PPAC/PIB/Industry Reports)

Within India, the ethanol market is estimated at approximately USD 3–4 billion and is projected to grow at a CAGR of ~14% over the next decade (industry estimates), driven primarily by policy-led demand creation under the Ethanol Blended Petrol (EBP) Programme. (Source: MoPNG/PPAC/PIB/Industry Reports)

Structural Architecture: India's Ethanol Supply Value Chain

India's ethanol supply chain is anchored in an upstream feedstock base, a mid-stream distillation and refining network, and a downstream blending and distribution infrastructure operated by Oil Marketing Companies (OMCs). Feedstocks fall into two broad categories:

- **First-generation (1G)** sources, which include sugarcane-derived products such as B-heavy molasses, C-heavy molasses, sugarcane juice and syrup, along with food grains such as rice, maize, and broken wheat.
- **Second-generation (2G)** sources, comprising lignocellulosic agricultural residues such as rice straw and wheat straw, as well as municipal solid waste. The government's progressive feedstock liberalisation since 2018, extending permitted sources beyond C-heavy molasses to include grains and, more recently, sugarcane juice and syrup, has significantly widened the raw material base and enhanced supply resilience.

Blending Progress: A Decade of Transformative Acceleration

India's EBP Programme, originally launched in 2003 and significantly accelerated post-2014, has witnessed substantial progress. Ethanol blending increased from 1.53% in ESY 2013-14 to ~15% in 2023-24, and further to ~20% in ESY 2025-26, achieving the E20 target ahead of the original 2030 timeline (as per PPAC / MoPNG data). (Source: MoPNG/PPAC/PIB/Industry Reports)

The Government has indicated its intent to explore higher blending targets beyond E20, with an Inter-Ministerial Committee (IMC) currently evaluating the roadmap for the post-ESY 2025-26 period. While discussions around E27–E30 blending have emerged, formal targets are yet to be notified.

The programme has delivered significant macroeconomic benefits. As per Government estimates (PIB):

- Foreign exchange savings of over ₹1,00,000 crore (Source: MoPNG/PPAC/PIB/Industry Reports)
- Reduction in crude oil imports
- Meaningful CO_2 emission reduction
- Substantial income support to farmers and distilleries

Exhibit 1: Ethanol Blending Progress Trajectory — ESY 2013-14 to ESY 2024-25

Ethanol Supply Year (ESY)	Volume Blended	Blending %	Key Milestone
ESY 2013-14	38 crore litres	1.53%	Programme inception
ESY 2019-20	173 crore litres	5.0%	Policy acceleration under CCEA
ESY 2021-22	460 crore litres	10.17%	E10 target achieved 5 months early
ESY 2022-23	502 crore litres	12.06%	Grain feedstock diversification
ESY 2023-24	545 crore litres	14.60%	Multi-feedstock capacity ramped
ESY 2024-25 (Full Year)	~800+ crore litres	~19.9% (peak Jul 2025)	E20 achieved ahead of schedule
ESY 2025-26 (Nov 2025–Feb 2026)	353.7 crore litres*	20% (sustained)	E20 milestone held; 30% target by 2030 announced

*Nov 2025–Feb 2026 cumulative per PPAC/MoPNG data; ESY 2025-26 runs Nov 2025–Oct 2026.
Source: PPAC, Ministry of Petroleum and Natural Gas / PIB

The cumulative impact of this accelerating programme has been substantial. Between 2014 and 2025, the EBP Programme generated foreign exchange savings of approximately ₹1,06,072 crore, reduced crude oil imports by 181 lakh metric tonnes, and averted 544 lakh metric tonnes of CO2 emissions. OMCs disbursed ₹1,45,930 crore to distillers and over ₹87,558 crore to farmers, creating a meaningful rural income multiplier. In ESY 2025-26, which runs from November 2025 to October 2026, India has sustained 20% blending since November 2025 — the earliest month of the supply year — maintaining it consistently through February 2026. Between November 2025 and February 2026, OMCs received 327.5 crore litres of ethanol and total blending reached 353.7 crore litres. OMC public sector units held ethanol stocks of 77.8 crore litres as of February 2026, reflecting a well-supplied system. India's total ethanol production capacity stood at approximately 1,990 crore litres as of November 2025, against a target of 1,700 crore litres — indicating the sector has comfortably exceeded its capacity benchmarks. (Source: MoPNG/PPAC/PIB/Industry Reports)

The government has officially announced a post-E20 target of 30% ethanol blending (E30) by 2030, though the Ministry of Petroleum and Natural Gas has clarified that a formal Inter-Ministerial Committee (IMC) has been constituted to recommend blending targets

starting from ESY 2026-27, with its report yet to be submitted as of April 2026. The sugar industry, through the Indian Sugar and Bioenergy Manufacturers Association (ISMA), has advocated for an interim E27 target, noting that the sector has invested over ₹40,000 crore and holds annual production capacity exceeding 9,000 million litres from sugarcane alone — sufficient to support blending well beyond E20. (Source: MoPNG/PPAC/PIB/Industry Reports)

Exhibit 2: Financing Structure — India Ethanol Distillery Sector

Financing Channel	Share of Total	GST/Tax Position	Strategic Implication
Bank Loans / Term Debt	~45–50%	Low (5% GST for EBP)	Backbone of expansion; key for mid-size distilleries
Private Equity & Venture	~20–25%	Market-linked	Growth capital for large chains; M&A-driven
Government Schemes (EISS, JI-VAN, VGF)	~15–20%	Subsidized / Nil	Supports 2G plants and cooperative mills
Internal Accruals & Promoter	~10–15%	—	Sustains brownfield expansions

Source: RIL Research; Ministry of Petroleum & Natural Gas; Industry Estimates

Competitive Landscape: Key Players and Strategic Positioning

India's ethanol production base is fragmented across hundreds of sugar mills, standalone distilleries, and integrated agro-processing facilities. Consolidation is underway, led by:

- **Praj Industries —** Leading technology provider and EPC contractor with strong presence in 1G and 2G ethanol projects; plays a critical role in capacity creation across India.
- **Indian Oil Corporation Limited —** Public sector major developing large-scale 2G ethanol capacity, including the Panipat plant, as part of its energy transition strategy.
- **Bajaj Hindusthan Sugar Ltd —** Among the largest integrated sugar and ethanol producers with substantial distillery capacity across multiple plants.
- **Balrampur Chini Mills Ltd —** One of the most efficient sugar players with significant ethanol capacity expansion and strong operational metrics.
- **Triveni Engineering & Industries Ltd —** Integrated player with diversified revenue streams and increasing focus on ethanol-led growth.
- **Dalmia Bharat Sugar and Industries Ltd —** Actively expanding distillery capacity with a strategic shift toward ethanol as a core revenue driver.
- **Godavari Biorefineries Ltd —** Diversified bio-refinery player with ethanol, chemicals, and grain-based distillery expansion.
- **Shree Renuka Sugars Ltd —** One of the largest sugar and ethanol producers with domestic and international operations (including Brazil).
- **NSL Sugars Ltd —** Significant player in southern India with integrated sugar and ethanol operations.
- Davangere Sugar Company Ltd — Karnataka-based integrated sugar and ethanol producer; represents the growing importance of southern India in ethanol capacity.

The FCI rice allocation has been a critical government lever: 52 lakh MT each for ESY 2024-25 and 2025-26, supplementing 40 LMT of sugar permitted for ethanol use in ESY 2024-25. Maize now accounts for 45.68% of ESY 2025-26 allocations, followed by FCI rice (22.25%), sugarcane juice (15.82%), and B-heavy molasses (10.54%). (Source: MoPNG/PPAC/PIB/Industry Reports)

Key Challenges and Headwinds

- **Food vs. fuel usage:** Diversion of maize and rice to ethanol has converted India from a net maize exporter to importer (US$ 103M imports in Apr–Jun 2024); NITI Aayog estimates E20 requires ~4.8 million additional hectares of maize cultivation (Source: MoPNG/PPAC/PIB/Industry Reports)
- Vehicle Compatibility: E20 fuel in vehicles originally designed for E0/E10 can lead to a modest reduction in fuel efficiency — typically 2–4% in two-wheelers and 4–6% in four-wheelers, as noted by SIAM and ARAI. The government has mandated that all new vehicles manufactured from April 2025 be tuned for E20 compatibility, which will significantly mitigate efficiency losses going forward. (Source: MoPNG/PPAC/PIB/Industry Reports)
  Source: Society of Indian Automobile Manufacturers (SIAM) and the Automotive Research Association of India (ARAI)
- **Feedstock price volatility:** Sugarcane FRP (Fair and Remunerative Price) raised to ₹355/quintal for SMY (Sugar Marketing Year) 2025-26 (+4% YoY); administered ethanol output prices may not always keep pace with input cost escalation, compressing distillery margins (Source: MoPNG/PPAC/PIB/Industry Reports)

- **Long-term EV risk:** Rising BEV (Battery Electric Vehicle) penetration in Europe (>20% of new registrations in 2024) and China (35.7% NEV sales in 2025) will gradually compress the petrol pool; material for long dated 2G project underwriting. (Source: MoPNG/PPAC/PIB/Industry Reports)
- **Capacity Overhang and Demand-Supply Imbalance:** India's ethanol production capacity has expanded to ~1,700–1,990 crore litres per annum as of 2025 (Source: MoPNG/DFPD), while the requirement for achieving 20% blending (E20) is ~1,000–1,100 crore litres (Source: PIB; NITI Aayog). This implies a surplus capacity of ~800–900 crore litres.

Strategic Initiatives and Policy Environment

The policy architecture supporting India's ethanol sector is multi-layered and has seen significant reinforcement in 2024-25. At the central level, the National Policy on Biofuels 2018, as amended in 2022, remains the overarching framework, articulating feedstock permissions, blending targets, and institutional roles. The EBP Programme is administered by the Ministry of Petroleum and Natural Gas in coordination with the Ministries of Food Processing and Agriculture.

The Union Cabinet, in August 2024, approved the modified Pradhan Mantri JI-VAN Yojana, extending its timeline to 2028–29 and expanding its scope beyond cellulosic ethanol to advanced biofuels. The scheme has sanctioned six commercial and four demonstration 2G ethanol plants along with additional funding for demonstration units and a Centre of Excellence. In early 2025, three new 2G ethanol plants with a combined capacity of 350 million litres were approved, indicating a shift toward lignocellulosic feedstocks such as rice and wheat straw. India targets blending 5–10 billion litres of cellulosic ethanol by 2030. On March 6, 2025, the government introduced a subvention scheme enabling Cooperative Sugar Mills to convert existing distilleries into multi-feedstock units, addressing structural limitations in the sector. Additionally, the GST rate on ethanol for the EBP Programme remains at 5%, providing a key fiscal incentive to support its economic viability. (Source: MoPNG/PPAC/PIB/Industry Reports)

The Global Biofuels Alliance, launched under India's G20 Presidency in 2023, provides an important multilateral platform that reinforces India's position as a global biofuels leader and opens pathways for technology collaboration, standards harmonisation, and knowledge transfer on 2G and sustainable aviation fuel (SAF) pathways. India's ambition to produce 8 to 10 million metric tonnes of SAF by 2040 underlines the longer-term strategic trajectory of the ethanol and biofuels sector beyond conventional blending applications. (Source: RIL Research; Ministry of Petroleum & Natural Gas; DFPD; Industry Sources)

Global Scenario: Recent Developments and Trade Dynamics

The global ethanol landscape is being actively reshaped by policy, trade, and technology forces in 2024-25. Brazil, the world's second-largest producer, raised its ethanol blend requirement to 27.5% in 2024 under its 'Combustível do Futuro' legislation, creating an incremental demand pool of approximately 1.3 billion litres and boosting sugarcane ethanol output to 36 billion litres — sufficient to fuel an estimated 20 million cars annually. Raízen, Brazil's leading integrated sugar-ethanol company, launched a US$ 1 billion sugarcane ethanol facility in São Paulo in 2024, converting 18 million tonnes of sugarcane per year into 2.2 billion litres of ethanol. Brazil's E27.5 blend mandate, combined with the fact that over 90% of new vehicles sold are flex-fuel capable, underscores the maturity and depth of its ethanol economy relative to other markets.

In the United States, the Renewable Fuel Standard (RFS) remains the cornerstone policy driver, mandating approximately 15 billion gallons of corn ethanol annually. In September 2024, POET, the country's largest biofuel producer, expanded its bioethanol production capabilities with a new facility designed to serve escalating demand. ADM partnered with Marathon Petroleum to build a US$ 400 million carbon capture ethanol facility in Illinois targeting sequestration of 2 million metric tonnes of CO2 annually — reflecting a strategic pivot by US ethanol producers towards carbon intensity reduction as the pathway to premium pricing under low-carbon fuel standards and voluntary carbon markets. Alto Ingredients entered a definitive agreement for a carbon capture and storage (CCS) project at its Pekin campus in early 2024, further illustrating this trend.

Conclusion

India's ethanol sector has, as of April 2026, validated the effectiveness of its integrated policy architecture. E20 has been achieved and sustained since the start of ESY 2025-26 — six years ahead of the original 2030 deadline. The next challenge is managing the consequences of this success: the 1.7x oversubscription of the ESY 2025-26 Cycle 1 tender reveals an emergent supply overhang that, without timely post-E20 policy signals, could weigh on plant utilisation and debt serviceability. With E30 targeted by 2030 and 2G cellulosic ethanol emerging as the next frontier, the investment cycle is far from complete. For lenders, revenue visibility has improved substantially through administered pricing and LTOAs — but feedstock volatility, allocation competition, and 2G technology risk require the kind of specialised, rigorous technical due diligence.

Resurgent India Limited's imprint in the ethanol industry

Resurgent India Limited has progressively expanded its footprint across India's ethanol sector, covering diverse project types from molasses-based distilleries to grain-based and emerging 2G ethanol facilities. This pan-India engagement has enabled it to develop insights into feedstock-linked operations, comparing performance across sugarcane- and grain-based ecosystems.

RIL has also differentiated between integrated sugar complexes, standalone distilleries, and multi-feedstock facilities, analysing their financial and operational models. Furthermore, its exposure to evolving policy frameworks, blending mandates, and supply chain dynamics has strengthened its understanding of the sector's structural drivers. These insights now support Resurgent India's feasibility studies and project appraisal capabilities, assisting stakeholders in navigating investment decisions within India's ethanol landscape.

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