

Tyre Pyrolysis Plant Setup, Feasibility Study, ROI Analysis and Business Plan Consultant

A Detailed DPR Covering CapEx/OpEx, Thermal Pyrolysis Process, Multi-Product Economics, ROI and the Global Opportunity in Pyrolysis Oil, Recovered Carbon Black

BROOKLYN, NY, UNITED STATES, May 19, 2026 /EINPresswire.com/ -- Setting up a tyre pyrolysis plant converts an environmental liability into a three-revenue-stream industrial operation. Waste tyres are generated in enormous and growing volumes globally with nowhere viable to go — landfilling is restricted, open

burning is prohibited, and stockpiles pose fire and public health risks. Pyrolysis thermally decomposes waste tyres in an oxygen-free environment to yield tyre pyrolysis oil (TPO), recovered carbon black (rCB), reusable steel wire, and syngas. Each output has a defined commercial market, and the syngas self-fuels the reactor — reducing energy costs. India’s waste tyre pyrolysis plant investment opportunity is strengthened by the EPR (Extended Producer Responsibility) framework, which obligates tyre producers to finance waste tyre collection and processing, providing certified pyrolysis operators with a structured supply chain.



IMARC Group’s [Tyre Pyrolysis Plant Project Report](https://www.imarcgroup.com/tyre-pyrolysis-manufacturing-plant-project-report/requestsampl) is a complete DPR and tyre pyrolysis feasibility study for waste management investors and circular economy entrepreneurs. It covers the full tyre pyrolysis plant setup — a waste tyre pyrolysis plant setup — from tyre shredding and pre-treatment through pyrolysis reactor operation, vapour condensation, carbon black processing, and steel separation — with complete tyre pyrolysis plant CapEx and OpEx modelling and 10-year financial projections.

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Three forces are converging to make tyre pyrolysis a commercially viable and policy-supported investment:

India's EPR policy for waste tyres (notified July 2022 under Hazardous Waste Rules) mandates that tyre producers and importers take responsibility for end-of-life tyre collection and processing. EPR obligations scaled from 35% in 2022–23 to 100% by 2024–25. Tyre producers fulfil these obligations by purchasing EPR certificates from registered pyrolysis and recycling operators. This creates a commercial revenue mechanism—beyond product sales—for compliant pyrolysis operators. India recycled approximately 3 million MT of tyres in FY2024–25, with pyrolysis accounting for 2.68 MMT of that volume.

Tyre pyrolysis oil (TPO) is a viable substitute for furnace oil in cement kilns, industrial boilers, and power generation. As conventional fuel prices rise and refineries explore circular feedstocks, demand for TPO is expanding. NITI Aayog's May 2026 national conference on waste tyre management proposed allowing TPO from imported tyre-derived feedstock for use in refineries—a significant policy upgrade that would further expand the domestic TPO market.

Recovered carbon black (rCB) from tyre pyrolysis has historically been used as a low-grade filler in rubber and road construction. Advances in post-processing technology—thermal or chemical upgrading—are improving rCB quality to ASTM N300–N500 grade specifications, making it suitable for tyre manufacturing and specialty rubber applications. Global demand for rCB as a sustainable replacement for virgin carbon black is growing alongside circular economy mandates. NITI Aayog has proposed national quality standards and a separate HSN code for rCB to formalise the market.

Figure 1: Tyre pyrolysis co-products

A tyre pyrolysis production plant generates four co-products from each tonne of waste tyre processed:

- **Pyrolysis oil (TPO)—35–45% yield:** The primary revenue product. Used as fuel in cement kilns, ceramic kilns, industrial furnaces, and marine vessels. A pyrolysis oil manufacturing plant targeting cement and ceramics clusters has consistent, large-volume offtake. Calorific value of 9,000–10,500 kcal/kg—comparable to light furnace oil.
- **Black powder residue (rCB)—30–35% yield:** Black powder residue from the pyrolysis reactor. Used in rubber compounding, plastic masterbatch, pigments, and road construction. Higher grades suitable for tyre production after thermal upgrading. A recovered carbon black plant adds significant value over raw carbon char through grinding, pelletising, and quality

certification.

- **Iron and steel scrap** — 10–15% contribution: Separated from the carbon residue by magnetic separation. Sold directly to steel scrap dealers or rolling mills. Minimal processing required. Low-margin but 100% recoverable revenue contribution.
- **Non-condensable gas** — 10–15% contribution: Non-condensable gas produced during pyrolysis. Calorific value of 3,500–4,500 kcal/Nm³. Used to self-fuel the pyrolysis reactor, reducing external fuel consumption and tyre pyrolysis plant OpEx by 20–30%.

More information on tyre pyrolysis plants: <https://www.imarcgroup.com/tyre-pyrolysis-manufacturing-plant-project-report>

Tyre pyrolysis is a thermochemical decomposition process conducted in an oxygen-free reactor environment. Two main configurations exist: batch/advanced batch, and continuous. Gujarat Pollution Control Board approved continuous pyrolysis plants in India, signalling the regulatory direction:

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- **Feedstock collection**: Passenger car, truck, and OTR (off-the-road) tyres are collected through EPR-registered collection channels. Tyre type and size determine shredder configuration and expected product yields. Consistent feedstock is critical for stable reactor operation
- **Feedstock preparation**: Whole tyres are shredded into chips (50–150 mm) or crumbs (2–25 mm) for continuous systems. Steel wire may be partially removed by magnetic separation at this stage. Pre-treatment reduces reactor loading time and improves heat transfer efficiency
- **Pyrolysis reactor**: Shredded tyres are loaded into the pyrolysis reactor (rotary kiln, fixed batch vessel, or continuous screw reactor). The reactor is heated to 400–600°C under nitrogen or syngas blanket in the absence of oxygen. Tyre rubber thermally cracks into vapour, liquid, solid char, and gas fractions over 45–240 minutes depending on reactor design
- **Condensation**: Hot pyrolysis vapours exit the reactor and pass through a condenser system (spray condenser or shell-and-tube heat exchanger). The vapours cool and condense into liquid TPO collected in storage tanks. Non-condensable syngas exits the condenser and is piped back to the reactor burner
- **Char residue**: Solid carbon char residue remains in the reactor after each cycle. It is removed by auger or pneumatic conveyor, cooled, and processed through a ball mill or raymond mill for size reduction. Magnetic separation removes residual steel. The resulting rCB is tested for iodine number, DBPA, and mesh residue for quality

classification

- **Steel separation and baling:** Steel separated from the carbon residue is collected, baled, and sold to scrap dealers. In pre-shredding with magnetic separation, steel wire may be baled before the reactor cycle
- **Raw TPO settling and filtering:** Raw TPO is settled and filtered to remove suspended carbon and water. Distillation can further fractionate TPO into diesel-range and light fuel fractions. Purified oil is stored in bunded steel tanks and dispatched to industrial fuel buyers

Operational parameters:

Production capacity:

- The proposed facility is designed with an annual production capacity ranging between 20,000–50,000 MT of waste tyre input, enabling economies of scale while maintaining operational flexibility

Financial performance:

- Gross Profit: 35–45%
- Net Profit: 15–20% after financing costs, depreciation, and taxes

Operating costs breakdown:

- Raw Materials (waste tyres): 30–40% of total OpEx—significantly lower than most manufacturing sectors due to the low or zero cost of waste tyre feedstock; EPR certificate income partially offsets this
- Utilities: 20–25% of OpEx—reactor heating and condensation are the primary energy consumers; syngas self-fuelling reduces external fuel dependency

Facility layout and components:

- **Key components:** tyre storage yard (covered), shredder bay, reactor building, condensation and oil storage area, carbon black processing unit, steel separation and baling area
- **Process equipment:** tyre shredder, pyrolysis reactor (batch, advanced batch automated, or continuous), condenser and oil collection system, syngas handling and burner system, rotary cooler for carbon char

- **粉碎及筛分系统**：球磨机或雷蒙磨，磁选机，造粒机或打包系统 for rCB
- **废气处理系统**：燃烧室 for syngas, 文丘里除尘器 and 湿静电除尘器 for stack emissions, 废水处理系统
- **合规与许可**：CPCB EPR registration, SPCB Consent to Operate, Hazardous Waste Authorisation, fire NOC; 轮胎热裂解工厂设置成本包括运营前合规费用 and 初始轮胎供应协议。

更多详细信息请参见：

<https://www.imarcgroup.com/request?type=report&id=19444&flag=C>

全球轮胎热裂解油市场

The global tyre pyrolysis oil market, valued at USD 383.32 million in 2025, is projected to reach USD 622.75 million by 2034 at a CAGR of 5.5%. Asia Pacific leads both tyre waste generation and pyrolysis capacity, with India being the fastest-growing market.

印度：India processes approximately 3 million MT of waste tyres annually, with pyrolysis accounting for 2.68 MMT in FY2024–25. The Gujarat Pollution Control Board approved continuous pyrolysis plants, establishing the regulatory pathway for formal large-scale operations. NITI Aayog’s May 2026 conference proposed national quality standards for TPO and rCB, a separate HSN code, and GST rationalisation to formalise the market and improve producer economics. The government is also exploring import permissions for waste tyres to augment domestic feedstock supply.

欧盟：The EU Circular Economy Action Plan mandates progressive end-of-life tyre recycling targets and rCB reuse in new tyre manufacturing. Bridgestone Corporation began commercial TPO and rCB production in 2023. Contec S.A. commissioned its 3rd and 4th pyrolysis plants (November 2024). Emissions standards and quality frameworks in Europe are setting the benchmark that India’s policy proposals are now following.

美国：Growing demand for alternative industrial fuels and sustainability compliance is expanding the TPO market. Liberty Tyre Recycling launched the first nationwide bicycle tyre recycling programme in December 2024. IRA circular economy incentives are supporting tyre-derived fuel and rCB investment.

中国：China has the world’s largest tyre pyrolysis sector, though dominated by unregulated small-scale operators. Regulatory formalisation is consolidating the sector toward larger, emission-compliant plants. Southeast Asian markets are following similar trajectories.

Location Decisions for a Tyre Pyrolysis Plant

Location decisions for a tyre pyrolysis plant setup directly affect feedstock availability, emission compliance, and product market access:

- **Feedstock Availability:** Waste tyres are bulky and expensive to transport per unit of feedstock value. Proximity to dense tyre generation zones—auto workshops, fleet operators, tyre retreading clusters, and urban scrap markets—reduces collection logistics cost. Industrial states with dense vehicle populations (Maharashtra, Gujarat, UP, Tamil Nadu, Rajasthan) offer the best tyre collection density
- **Regulatory Compliance:** Tyre pyrolysis is classified as a hazardous waste processing activity under CPCB rules. Plants must be located in industrial zones designated for hazardous waste processing, with minimum setback distances from residential areas. Industrial estates with existing SPCB-approved hazardous waste infrastructure reduce environmental clearance timeline
- **Proximity to Buyers:** TPO buyers—cement plants, ceramics units, industrial boilers—are geographically concentrated. A tyre pyrolysis production plant located within 100–300 km of a cement cluster or ceramics belt maximises TPO logistics economics. rCB buyers in rubber and plastic compounding are similarly geographically clustered
- **Government Incentives:** India—EPR certificate income as a supplementary revenue stream, PMEGP and CGTMSE loan support for MSME-scale pyrolysis units, potential GST rationalisation on rCB and TPO under NITI Aayog proposals, state hazardous waste processing incentives

Process Flow and Equipment

IMARC Group's Tyre Pyrolysis Plant Project Report is a complete tyre pyrolysis business plan and technical reference:

- **Process Flow:** from tyre shredding through pyrolysis reactor, condensation, carbon black processing, steel separation, and dispatch
- **Equipment:** reactor, shredder, condenser, carbon processing, pollution control equipment
- **Operating Costs:** tyre pyrolysis plant OpEx covering feedstock, utilities, labour, emission compliance, and maintenance
- **Financial Metrics:** tyre pyrolysis plant ROI, IRR, NPV, DSCR, break-even, and sensitivity tables across feedstock cost and TPO pricing scenarios

- Batch versus advanced batch automated versus continuous reactor — CapEx, compliance, throughput, and product quality comparison for a waste tyre recycling plant
- TPO, rCB, steel, EPR certificates — blended margin and pricing scenario analysis
- across 20,000 and 50,000 MT/year input configurations
- CPCB SOP 2024, Hazardous Waste Rules authorisation, EPR registration, SPCB Consent to Operate, emission monitoring requirements

The report is built for circular economy investors evaluating a tyre pyrolysis plant investment, industrial fuel distributors considering backward integration, and banks requiring a bankable tyre pyrolysis feasibility study for project financing.

For more information, please contact us at info@imarcgroup.com or call us at +91 8860 441 630.

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