Strategic Analysis: Operational Resilience and Future Trajectory of LEUNA-Harze GmbH in the European Epoxy Market

1. Executive Summary

The European chemical sector is currently navigating a period of profound structural transformation, defined by the convergence of volatile energy markets, stringent decarbonization mandates under the European Green Deal, and intensifying global competition. Within this turbulent landscape, LEUNA-Harze GmbH, an owner-managed medium-sized enterprise located in the historic Leuna Chemical Complex in Saxony-Anhalt, Germany, distinguishes itself through a strategy of vertical integration, technological agility, and proactive sustainability.

This report provides an exhaustive analysis of LEUNA-Harze GmbH's development status as of early 2025 and projects its future outlook through the next decade. The company has evolved from the privatized remnants of the former VEB Leuna-Werke into a leading independent European manufacturer with an annual production capacity of 70,000 tonnes of liquid epoxy resins and 10,000 tonnes of reactive diluents.[1] Unlike multinational competitors such as Westlake Corporation, which recently announced the cessation of operations at its Pernis facility due to deteriorating European business conditions, LEUNA-Harze has maintained a trajectory of capacity expansion and modernization.[3]

A central pillar of the company's resilience is its "Move to Green" strategy. By leveraging the synthesis of epichlorohydrin from glycerin—a renewable by-product of biodiesel production—rather than the traditional petrochemical propylene route, LEUNA-Harze has successfully commercialized a portfolio of bio-based resins (the Epilox® G-Series) that offer significant carbon footprint reductions without compromising technical performance.[5] This technological differentiation, combined with the company's physical integration into the Leuna site's "Verbund" infrastructure, provides a competitive hedge against feedstock volatility and energy costs.

Financially, the company demonstrates stability with total assets of €185.7 million as of December 31, 2024, and a revenue trajectory consistent with its expanded asset base.[7] However, the outlook is not without challenges. The German domestic market faces headwinds from a contracting construction sector and high industrial electricity prices. Nevertheless, the ongoing anti-dumping investigations initiated by the European Commission against low-priced imports from Asia may provide a critical protective mechanism for European producers in 2025 and beyond.[8]

The analysis concludes that LEUNA-Harze is uniquely positioned to capitalize on the consolidation of the European supply base. As competitors exit the market, LEUNA-Harze's backward-integrated, bio-preferred manufacturing model offers a strategic blueprint for the survival and growth of the European chemical "Mittelstand" in a post-fossil era.

2. Macro-Strategic Context: The European Chemical Industry Crisis

To fully appreciate the development status of LEUNA-Harze GmbH, one must first situate the company within the broader crisis affecting the European chemical industry. This context is essential for understanding why LEUNA-Harze's continued expansion is both an anomaly and a strategic triumph.

2.1 The Energy and Feedstock Dilemma

Germany, traditionally the chemical powerhouse of Europe, has faced severe competitiveness challenges following the energy crisis precipitated by the geopolitical events of 2022. The chemical industry is energy-intensive, and German producers have historically relied on affordable pipeline gas. The structural shift in energy pricing has placed European manufacturers at a disadvantage compared to competitors in the United States (benefiting from shale gas) and the Middle East (advantaged by low-cost hydrocarbons). Reports from ICIS and Atradius indicate that German chemical production (excluding pharmaceuticals) is expected to contract further in 2025, driven by weak domestic demand and high operating costs.[10]

In this environment, LEUNA-Harze's integration into the Leuna Chemical Complex is a decisive factor. The site's centralized energy infrastructure and the company's ability to utilize steam and waste heat allow for cost mitigation that standalone producers cannot achieve.[12] Furthermore, by shifting feedstock dependence from crude-oil-derived propylene to vegetable-oil-derived glycerin for its epichlorohydrin production, LEUNA-Harze partially decouples itself from the volatility of the petrochemical energy complex.[6]

2.2 Regulatory Pressure and the Green Deal

The European Union's Chemical Strategy for Sustainability and the "Fit for 55" package impose stringent requirements on chemical producers to reduce carbon emissions and eliminate hazardous substances. The upcoming Carbon Border Adjustment Mechanism (CBAM) will eventually tax carbon-intensive imports, theoretically leveling the playing field for greener European production. However, in the interim, European companies bear the high capital costs of compliance.

LEUNA-Harze has turned this regulatory burden into a strategic offensive. By achieving certifications such as ISO 14001, ISO 50001, and maintaining EMAS (Eco-Management and Audit Scheme) registration for 25 years, the company positions itself as a "safe harbor" supplier for downstream customers (e.g., in automotive and wind energy) who are themselves under pressure to decarbonize their supply chains.[13]

3. Corporate DNA and Historical Evolution

3.1 From State Combine to Family Ownership

The industrial lineage of LEUNA-Harze GmbH traces back to 1956, when epoxy resin research and production began at the VEB Leuna-Werke in the former German Democratic Republic (GDR). For decades, the site was a central node in the Eastern Bloc's chemical production network. Following German reunification, the massive industrial combine was unbundled and privatized.

In 1995, the epoxy resin business unit was re-established as LEUNA-Harze GmbH, an independent, medium-sized enterprise. This transition from a state-run entity to an owner-managed company marked a profound

shift in corporate culture and strategy. Under the stewardship of the management team, led by Managing Director Klaus Paur, the company adopted a philosophy of "Experience, Performance, Innovation," focusing on long-term value creation rather than quarterly stock performance.[15] This ownership structure has proven critical during market downturns, allowing the company to sustain capital investment cycles—such as the construction of new plants—when public companies might have frozen spending to protect dividends.

3.2 Chronology of Strategic Expansion

The company's growth has been characterized by a stepwise cadence of capacity expansion and vertical integration, transforming it from a simple resin formulator into a fully integrated chemical synthesizer.

- **1995:** Foundation of LEUNA-Harze GmbH.
- **1998–2007:** Phase I Expansion. Construction and commissioning of new production plants (LH1, LH2, LH3), increasing liquid resin capacity from an initial 8,000 tonnes to 40,000 tonnes annually.[2]
- **2004–2008:** Diversification into reactive diluents, achieving a capacity of 7,000 tonnes.
- **2008: Strategic Milestone: Backward Integration.** Commissioning of the Bisphenol F plant. This was the first major step toward feedstock independence, securing the supply of this high-performance component.[2]
- **2012: Technological Breakthrough.** Commissioning of the chlorine-alkali electrolysis and epichlorohydrin (ECH) plants. This investment enabled the "Glycerin-to-ECH" route, forming the technical basis for the company's current sustainability strategy.[2]
- **2015:** Investment in a dedicated hardener production plant, strengthening the company's position as a complete system provider.[17]
- **2017:** Commissioning of "LEUNA-Harze 4," a major capacity expansion adding 30,000 tonnes of Bisphenol A/F resins, bringing total liquid resin capacity to 70,000 tonnes per year.[1]
- **2020–2021:** Construction of a third phenolic resin plant to meet increased market demand, executed by EPC Engineering & Technologies GmbH despite the challenges of the pandemic era.[18]
- **2023:** Expansion of tank storage facilities for bio-based epichlorohydrin, signaling a commitment to scaling up the green product portfolio.[13]

4. Industrial Ecosystem: The Leuna Advantage

LEUNA-Harze does not operate in a vacuum; its competitiveness is deeply rooted in the industrial ecology of the Leuna Chemical Complex. This site operates on the "Verbund" principle, a highly integrated network of material and energy flows that maximizes efficiency and minimizes waste.

4.1 Infrastructure and Services

The site operator, InfraLeuna GmbH, provides a comprehensive suite of services that allows LEUNA-Harze to function with the lean overhead of a medium-sized company while accessing the infrastructure of a major industrial park.

- **Energy and Utilities:** InfraLeuna operates power plants and supplies steam, electricity, and technical gases. LEUNA-Harze utilizes steam from the site network for its thermal processes, contributing to high energy efficiency.
- **Logistics:** The site features an extensive internal rail network, pipeline connections, and road access, facilitating the bulk transport of raw materials like glycerin and the distribution of finished resins.[12]

- **Safety and Emergency Response:** A centralized site fire brigade and security force reduce the fixed costs for individual tenants.

4.2 Material Integration

The "Verbund" extends to chemical flows. LEUNA-Harze's production of chlorine (via electrolysis) creates hydrogen as a by-product. In a non-integrated site, this hydrogen might be vented or flared. At Leuna, it is fed back into the site's hydrogen network for use by other chemical producers (e.g., for hydrogenation processes), creating a revenue stream or credit that subsidizes production costs.[6] Similarly, the brine (salt solution) resulting from ECH production is treated and recycled back into the electrolysis process, closing the loop on material usage.

5. Technical Operations and Backward Integration

A distinct competitive advantage of LEUNA-Harze is its depth of manufacturing. While many "epoxy manufacturers" are merely compounders who purchase Liquid Epoxy Resin (LER) and mix it with additives, LEUNA-Harze synthesizes the molecules from basic building blocks.

5.1 Chlorine-Alkali Electrolysis

The foundation of the company's chemical chain is its on-site membrane electrolysis plant. This facility converts sodium chloride (salt) into chlorine gas and caustic soda (sodium hydroxide).

- **Strategic Importance:** Chlorine is difficult and dangerous to transport over long distances. On-site production guarantees supply security and eliminates the high logistical costs and risks associated with hazardous material transport. Caustic soda is utilized in the subsequent dehydrochlorination step of epoxy synthesis.

5.2 Epichlorohydrin Synthesis: The Green Route

The production of Epichlorohydrin (ECH) is the most critical technical differentiator for LEUNA-Harze.

- **Traditional Process (Competitors):** Most global competitors (e.g., Olin, Westlake) utilize the high-temperature chlorination of propylene (from crude oil) to produce allyl chloride, which is then oxidized to ECH. This process is energy-intensive and ties the producer to oil prices.
- **LEUNA-Harze Process (GTE):** LEUNA-Harze employs the Glycerin-to-Epichlorohydrin process. Glycerin reacts with hydrogen chloride (generated from the company's own chlorine) to form dichloropropanol, which is then treated with caustic soda to yield ECH.
    - **Chemistry:** $C_3H_8O_3 (Glycerin) + 2HCl \rightarrow C_3H_6Cl_2O + 2H_2O \rightarrow C_3H_5ClO (ECH)$
    - **Sustainability:** The feedstock, glycerin, is a byproduct of biodiesel production (transesterification of rapeseed or waste cooking oils). This is a renewable, bio-based feedstock that is often in surplus in Europe due to biofuel mandates.
    - **Efficiency:** The process operates at milder conditions than propylene chlorination and produces fewer chlorinated by-products.[5]

5.3 Bisphenol Production

The company produces Bisphenol F on-site. Bisphenol F (produced from phenol and formaldehyde) imparts

lower viscosity and higher chemical resistance to epoxy resins compared to the ubiquitous Bisphenol A. Producing this molecule in-house allows LEUNA-Harze to dominate the niche for chemical-resistant tank linings and industrial flooring, where these properties are mandatory.[2]

6. Product Portfolio Analysis

The LEUNA-Harze product range, marketed under the **Epilox®** brand, covers the entire spectrum of thermoset polymer requirements. The portfolio is structured to serve diverse industries, from civil engineering to high-tech electronics.

6.1 Epilox® Epoxy Resins

The core business volume is driven by liquid resins.

- **Unmodified Liquid Resins:** Standard DGEBA (Bisphenol A) and DGEBF (Bisphenol F) resins. Capacity: ~70,000 t/a. These are the workhorses of the industry.
- **Crystallization-Resistant Blends:** Pure Bisphenol A resin tends to crystallize (turn solid) at low temperatures, a major headache for logistics in European winters. LEUNA-Harze produces optimized A/F blends (e.g., Epilox® T 19-27) that remain liquid, facilitating handling on construction sites.[20]
- **High-Purity Electronic Grade:** For applications in semiconductor encapsulation (potting), resins must have extremely low ionic impurities (chlorine, sodium). LEUNA-Harze's controlled synthesis allows for the production of electronic-grade resins used in electric vehicle (EV) power electronics.
- **Solid Resins:** Produced for the powder coatings market, offering solvent-free coating solutions for metal appliances and automotive parts.

6.2 Epilox® Reactive Diluents

Reactive diluents are critical for adjusting the viscosity of epoxy systems without compromising the cross-linked network structure (unlike non-reactive solvents).

- **Capacity:** ~10,000 t/a.
- **Chemistry:** The company produces glycidyl ethers of various alcohols:
  - *Monofunctional:* C12-C14 alcohol glycidyl ethers (Epilox® P 13-18) for general viscosity reduction.
  - *Difunctional:* Hexanediol diglycidyl ether (Epilox® P 13-20) for maintaining mechanical strength.
  - *Trifunctional:* Trimethylolpropane triglycidyl ether (Epilox® P 13-30) for increasing cross-link density and chemical resistance.[21]
- **Innovation:** A key recent development is the introduction of **CMR-free diluents** (e.g., Epilox® P 13-17G). Traditional C12-C14 diluents faced regulatory reclassification as skin sensitizers or potential hazards. The new variants allow customers to formulate products that do not require the GHS08 (Health Hazard) pictogram, a significant marketing advantage for consumer-facing DIY epoxy kits.[13]

6.3 Epilox® Hardeners

To act as a "System House," LEUNA-Harze produces curing agents tailored to their resins.

- **Polyamines & Polyaminoamides:** The standard curing agents for coatings and construction.
- **Waterborne Hardeners:** Designed to emulsify liquid epoxy resins in water, enabling the production of Zero-VOC coatings that meet the strictest indoor air quality standards (e.g., AgBB schema in Germany).[22]

7. The "Move to Green" Strategy

The "Move to Green" initiative is not merely a marketing slogan but the central operational strategy for the company's future viability. It addresses the existential threat of carbon pricing and the market demand for sustainable materials.

7.1 Bio-Based "G-Series"

The **Epilox® G-Series** represents the commercial realization of the Glycerin-to-ECH technology. These products are chemically identical to petrochemical equivalents (drop-in solutions) but carry a renewable carbon burden.

- **Bio-Carbon Content:**
  - *Reactive Diluents:* **Epilox® P 13-18G** achieves **100% bio-based content**, as both the alcohol and the epichlorohydrin components can be sourced from renewables.
  - *Epoxy Resins:* **Epilox® A 19-00G** (Bisphenol A) typically contains ~28% bio-content, representing the ECH portion of the molecule. **Epilox® F 17-00G** (Bisphenol F) achieves ~30% bio-content.[5]
- **Segregated Production (No Mass Balance):** A critical differentiator is LEUNA-Harze's claim of segregated production lines. Unlike competitors who use "Mass Balance" accounting (allocating green credits to a specific batch while mixing feedstocks), LEUNA-Harze processes bio-glycerin in dedicated campaigns, ensuring the physical presence of bio-molecules in the final product. This transparency is verified by radiocarbon (C14) dating.[14]

7.2 Life Cycle Assessment (LCA)

The company commissioned the **Ifeu Institute** (Heidelberg) to conduct a cradle-to-gate Life Cycle Assessment according to DIN EN ISO 14040/14044. The study confirmed that the glycerin-based ECH route generates significantly lower CO2 emissions than the propylene route. The utilization of waste glycerin (upcycling) credits the system with a lower environmental burden compared to using virgin crops. This data is essential for customers in the automotive and wind sectors who must report Scope 3 emissions in their ESG disclosures.[5]

7.3 Energy Transition 2035

Beyond raw materials, energy consumption is the second lever of decarbonization. LEUNA-Harze has set a target to power its production exclusively with renewable energy (wind and solar) by **2035**. Given the high energy intensity of chlorine electrolysis, this will require substantial Power Purchase Agreements (PPAs) with renewable generators in the Saxony-Anhalt region, which is a hub for wind energy in Germany.[5]

8. Market Position and Competitive Landscape

The European epoxy market is an oligopoly currently undergoing a phase of brutal consolidation.

8.1 Major Competitors

- **Olin Corporation (USA/Global):** The global volume leader. Olin operates massive assets but has been aggressively shutting down high-cost capacity in Europe (e.g., Stade, Germany) and the US to manage global oversupply.

- **Westlake Corporation (USA/Global):** Formerly Hexion's epoxy business. Westlake is a key competitor that is currently retreating.
- **Spolchemie (Czech Republic):** A regional peer located in Ústí nad Labem. Like LEUNA-Harze, Spolchemie focuses on green epoxy (EnviroPOXY) using bio-ECH. They are the closest direct competitor in terms of strategy and geography.
- **Asian Importers:** Manufacturers from China (e.g., Jiangsu Sanmu), Korea (Kumho, Kukdo), and Taiwan (Nan Ya) have historically exported large volumes to Europe.

8.2 The Westlake Pernis Exit: A Structural Shift

In a definitive move during 2024/2025, Westlake Corporation announced the permanent closure of its epoxy production facility in Pernis, Rotterdam. This plant produced Liquid Epoxy Resin (LER) and Bisphenol A. Westlake cited "continued business deterioration in Europe" and high costs as the reasons.[3]

- **Impact on LEUNA-Harze:** The closure of the Pernis plant removes a significant chunk of capacity from the European market. Customers who previously relied on Westlake's Dutch production must now secure alternative supply. LEUNA-Harze is the primary beneficiary of this redistribution of market share, particularly for customers in Germany and Central Europe who require short lead times and supply security.

8.3 Anti-Dumping Investigations

In late 2024, the "Ad Hoc Coalition of Epoxy Resin Producers" (comprising Olin, Westlake, and Spolchemie) successfully petitioned the European Commission to launch an anti-dumping investigation into imports from China, Korea, Taiwan, and Thailand.

- **The Allegations:** The coalition alleges that Chinese producers are dumping resin at margins of **140–170%**, effectively selling below the cost of raw materials to capture market share.[9]
- **Strategic Implication:** While LEUNA-Harze was not named as a primary petitioner in the snippet, the company stands to gain immensely. If the Commission imposes provisional duties in 2025 (as is expected in such cases), the price of Asian imports will spike. This will restore pricing power to European producers, allowing them to pass on their higher energy costs and improve margins. It effectively creates a protected market fortress for EU manufacturers.

9. Financial and Operational Health

9.1 Financial Metrics

While LEUNA-Harze is a private company and does not publish detailed quarterly earnings calls like Olin, statutory filings provide a snapshot of its health.

- **Balance Sheet (2024):** The company reported total assets of **€185.7 million** as of December 31, 2024. The liability side balances equally, reflecting a standard double-entry accounting structure.[24]
- **Revenue Trends:** Data visualizations suggest a revenue trajectory that scaled significantly with the commissioning of the LH4 plant in 2017. While exact 2024 revenue figures are redacted in the snippets, the asset base suggests a turnover in the mid-nine-figure range (estimated €150M–€200M).
- **Investment Capability:** The company has self-financed or bank-financed consecutive expansions (€22M for Bisphenol F, undisclosed millions for LH4 and the hardener plant). This indicates strong cash flow generation and a trusting relationship with lenders.[25]

9.2 Human Resources

The company employs approximately **200 people**. The workforce is highly stable, evidenced by the celebration of 25-year work anniversaries for 24 employees in 2020. This retention is crucial for the safe operation of complex chemical plants.[13]

10. Corporate Social Responsibility and Regional Integration

LEUNA-Harze operates with a strong sense of regional responsibility, characteristic of the German "Mittelstand."

10.1 Awards and Recognition

- **EcoVadis Bronze (2025):** The company was awarded a Bronze medal by EcoVadis, placing it in the top 35% of companies assessed for sustainability performance. This covers environment, labor rights, ethics, and procurement.[13]
- **Environmental Alliance Special Prize (2024):** Recognized as a finalist for the "Environmental Alliance of Saxony-Anhalt" prize for its synthesis of bio-based resins from waste oils.[13]
- **EMAS Anniversary:** In March 2025, the company celebrated 25 years of continuous registration with EMAS, one of the most rigorous environmental management systems globally.[13]

10.2 Education and Community

- **Deutschlandstipendium:** The company actively funds scholarships for high-achieving students at the Hochschule Merseburg, fostering the next generation of chemical engineers.[13]
- **"Chemie zum Anfassen":** LEUNA-Harze provides financial support to student laboratories that introduce children to chemistry, combating the skills shortage by sparking early interest in STEM fields.[13]
- **Bildungsakademie Leuna (BAL):** The company participates in open days to recruit apprentices for roles such as Chemical Technician (Chemikant) and Laboratory Technician, ensuring a pipeline of skilled labor.[13]

11. Future Outlook (2025–2035)

11.1 Short-Term Outlook (2025-2026): Stabilization and Opportunity

The immediate future for LEUNA-Harze will be defined by the "China Shock 2.0" and the European response.

- **Market Share Capture:** The company will likely operate at high utilization rates to fill the void left by Westlake's Pernis closure.
- **Price Recovery:** Assuming anti-dumping duties are implemented, epoxy prices in Europe will decouple from the depressed Asian spot numbers. This will allow LEUNA-Harze to repair margins that were likely squeezed during the 2023-2024 destocking period.
- **Product Launch:** The roll-out of the new CMR-free reactive diluents and GHS08-free systems will be a key focus for the sales team, targeting the construction and flooring markets that prioritize worker safety.

11.2 Mid-Term Outlook (2027-2030): The Green Transition

As the EU Green Deal mandates tighten (e.g., mandatory Scope 3 reporting, potential plastic taxes), the "G-Series" will transition from a premium niche to a standard requirement.

- **Expansion of Bio-Capacity:** It is highly probable that LEUNA-Harze will need to expand its bio-ECH capacity or secure additional bio-glycerin sources to meet the demand from wind energy OEMs (who need green blades) and automotive manufacturers.
- **Integration with Renewables:** We can expect announcements regarding direct investments in wind parks or solar installations at the Leuna site to meet the 2035 net-zero energy goal.

11.3 Long-Term Vision (2035): A Sustainable Material Technology Provider

By 2035, LEUNA-Harze aims to complete its transformation.

- **Energy:** 100% Renewable Power.
- **Feedstock:** Maximized use of circular and bio-based carbon.
- **Position:** No longer just a "resin producer," the company will position itself as a critical enabler of the Green Economy. In a scenario where Europe de-industrializes its commodity chemicals, LEUNA-Harze's survival will depend on this specialization—providing the high-value, traceable, green molecules that cannot be easily imported from regions with lower environmental standards.

12. Conclusion

LEUNA-Harze GmbH stands as a testament to the resilience of the owner-managed industrial model. In an era where multinational giants are retreating from Europe due to high costs, LEUNA-Harze is doubling down on the region's strengths: integration, innovation, and sustainability.

The decision taken over a decade ago to invest in the Glycerin-to-Epichlorohydrin route was prescient. It has provided the company with a technological moat that is now protecting it against high oil prices and carbon taxes. With a robust balance sheet, a modernized asset base, and a favorable shift in the competitive landscape (competitor exits and trade protection), LEUNA-Harze is well-equipped to navigate the current crisis. The company is not merely surviving; it is actively shaping the future of a sustainable European epoxy industry.

Table 1: Technical Analysis of Selected LEUNA-Harze Bio-Based Products

The following table details the technical specifications of the key "G-Series" products, illustrating their equivalence to standard petrochemical grades.

Product Name	Chemical Classification	Bio-Carbon Content (%)	Viscosity (25°C, mPa·s)	Epoxy Equivalent Weight (g/eq)	Primary Application
Epilox® P 13-18G	Monofunctional Reactive Diluent (C12-C14)	**100%**	5 – 10	270 – 305	Universal viscosity reducer; Flooring; Coatings.
Epilox® A 19-00G	Bisphenol A Liquid Resin	~28%	9,000 – 13,000	182 – 192	Civil engineering; Adhesives; Standard composites.
Epilox® F 17-00G	Bisphenol F Liquid Resin	~30%	2,500 – 4,500	165 – 175	Chemical resistant tank linings; Solvent-free coatings.
Epilox® T 19-27G	Bisphenol A/F Blend	~28%	6,000 – 9,000	175 – 185	Winter-grade construction systems; Injection resins.
Epilox® P 13-30G	Trifunctional Reactive Diluent (TMP)	~60%	100 – 150	135 – 145	High cross-link density systems; Chemical resistance.
Epilox® T 19-38/500G	Modified Epoxy Resin	42%	450 - 550	185 - 200	Injection resins; Low viscosity formulations.

Source: Compiled from LEUNA-Harze technical data sheets and product announcements.[5]

Table 2: Production Capacity Overview

Product Category	Estimated Annual Capacity (Tonnes)	Key Production Units	Strategic Note
Liquid Epoxy Resins (LER)	70,000	LH1, LH2, LH3, LH4	Includes BPA, BPF, and A/F blends.
Reactive Diluents	10,000	Specialized Etherification Units	Includes high-complexity glycidyl ethers.
Epichlorohydrin (ECH)	(Internal Use)	Chlorine-Alkali / GTE Plant	Produced from glycerin; fully captive use.
Hardeners	Undisclosed	Hardener Plant (2015)	Formulated amines and adducts.

Source: Derived from historical press releases and capacity expansion announcements.[1]

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