



At RAIN, we are building a future-ready manufacturing ecosystem through targeted capacity expansions, process optimisation and sustainable production practices. By deploying advanced technologies, energy-efficient systems and reliable infrastructure, we are enhancing productivity, product consistency and supply reliability across all business segments.

### Focus areas

- Capacity enhancement
- Productivity and efficiency
- Product quality and safety
- Sustainable manufacturing
- Ensuring raw material security

### 2025 highlights

# 1.09 Mn MWh

Energy generated from waste-heat recovery

### Stakeholders impacted

- Customers
- Government and regulators
- Employees
- Vendors and suppliers

### Material topics associated

- Climate and energy
- Circularity and innovation

# Manufactured capital

Manufactured capital

## Capacity enhancement

We made targeted investments, improved asset utilisation and advanced capacity-building programmes across our three business segments to scale our manufacturing capabilities. Enhanced raw material availability supported higher throughput at key facilities, while our strategic expansion projects continued to progress, strengthening long-term competitiveness. With phased capacity additions and reinstated operational flexibility, we are building a more resilient, efficient and future-ready manufacturing base.

### Enhanced utilisation of existing assets

We strive to improve throughput across our manufacturing locations by ensuring consistent raw material availability, operational agility and efficient planning.

#### Key developments

- Enhanced throughput at Indian Carbon facilities as stabilised raw material inflows enabled plants to function seamlessly without disruptions
- Better operating consistency across Carbon, Advanced Materials and Cement plants through targeted process improvements
- Reinstated blending operations to maintain material flexibility, streamline dispatch planning and better support regional supply requirements
- Leveraged contingency sourcing measures to drive production continuity during supplier disruptions and feedstock volatility

#### Outcome

Improved operational continuity supported stronger utilisation levels and reinforced supply reliability across customer locations.

## Capacity enhancement dashboard

Capacity level	2025 progress
Higher utilisation of existing assets	Improved throughput at Indian calcination units Stronger CPC volumes
Segment-wise capacity utilisation	Carbon: 69% Advanced Materials: 57% Cement: 64%
Solar electricity generation expansion	Completed and online in 2025

## Productivity and efficiency

During the reporting period, we focused on optimising processes, improving raw material utilisation, and enhancing energy and logistics efficiency to keep our facilities operating reliably in a dynamic environment.

### Process optimisation across segments



#### Carbon

- Leveraged contingency sourcing and flexible feedstock planning to minimise the impact of supplier disruptions
- Reinstated blending infrastructure to support smoother production and enhance responsiveness to customer requirements



#### Advanced Materials

- Optimised operations in an energy-intensive environment, balancing product mix and demand cycles
- Refined process controls and planning to manage the impact of higher utility costs in Europe
- Improved internal workflows to support consistent output and maintain service levels despite market variability



#### Cement

- Maximised outbound freight planning to improve cost competitiveness across our core markets
- Enhanced production planning to adapt to seasonality and sustain stable capacity utilisation

## Our efficiency levers

### Cost efficiency

#### Logistics innovations to manage cost and movement efficiency

We strengthened logistics performance across our Carbon and Cement businesses by improving transportation efficiency and refining freight planning.

#### Blending operations

The ability to import CPC into our SEZ facility enabled us to revive and scale our blending strategy, giving us greater flexibility in managing raw material inputs and optimising blend costs. This improvement also supported our US operations, helping increase capacity utilisation and strengthen overall cost competitiveness.

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**Operational efficiency**

**Using a broader range of GPC grades**

We enhanced our ability to utilise a wider spectrum of GPC grades. This flexibility allowed us to support consistent calcination throughput even as raw material markets remained competitive, particularly due to increased demand from the lithium-ion battery industry.

**Leveraging ACP technology for feedstock flexibility**

By using our proprietary Anhydrous Carbon Pellets (ACP), it would structurally help the consistency of incoming raw materials, enabling the use of diverse GPC qualities.

**Usage of alternative raw materials to expand sourcing options**

We increased the deployment of alternative raw materials in our operations, reducing reliance on traditional input sources and improving availability under volatile market conditions. Furthermore, we are now exploring the use of biocarbon materials in our carbon-based product portfolio. These include using:

- Bio-based raw materials in NOVARES® resins
- Alternative raw materials in PETRORES® and LIONCOAT® products

**Technology-led efficiency**

- Strengthened digital monitoring and control systems in our energy-intensive operations, which allowed us to operate through steadier processes and employ quicker adjustments during feedstock and energy fluctuations
- More integrated monitoring of inbound shipments and inventory flows resulted in faster response during supply disruptions
- Adoption of advanced technologies in our calcination kilns optimised the conversion of GPC into CPC, thereby maximising yield and profitability, including reduced production costs
- Employed technological innovations to broaden the raw material sourcing pool for our distillation business

**Product quality and safety**

We uphold stringent product quality and safety standards across all our manufacturing operations. By adhering to industry norms and aligning with global certifications, we ensure that every batch we produce meets customer requirements. Supported by mature quality management systems and technology-enabled monitoring, our approach maintains product consistency, process transparency and continuous improvement.

**Upholding global standards**

**ISO 9001**  
Quality Management System

**ISO 14001**  
Environmental Management System

**ISO 45001**  
Occupational Health and Safety Standards

**ISO 50001**  
Energy Management System

**Quality management system**

**Core QMS objectives**

- Systematic monitoring and control of all critical production parameters
- Standardised documentation and audit practices across facilities
- Monthly KPI review cycles to track product consistency
- Structured non-conformance reporting for rapid issue resolution
- Continuous improvement driven by root-cause analysis and preventive actions

**Technology-led quality**

**Real-time kiln performance diagnostics**

- Deployment of online carbon dioxide monitoring to identify deviations early
- Yield-measurement systems ensuring stable conversion from GPC to CPC
- Continuous kiln-health tracking to prevent deterioration of product quality

**Energy fluctuation control**

- Integration of power-consumption tracking systems to prevent temperature instability that can compromise product consistency

**Process stabilisation through operational optimisation**

- Stabilisation of kiln operations
- Reduction in unplanned disruptions contributes indirectly but materially to consistent product quality in both Carbon and Cement segment operations

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## Customer-centric quality improvement

We maintain open channels of engagement with customers to continue delivering on their expectations.

### Key mechanisms

- Certificates of Analysis shared with each shipment
- Regular customer surveys to gather feedback
- On-site visits and audits for closer collaboration
- Annual management reviews incorporating customer input

We consistently serve premium customers requiring stringent quality norms. This reinforces the consistency of formulations, calcination parameters and traceability across batches.

### Quality-driven impact in 2025

- Improved operational stability in Carbon kilns through optimisation measures
- Stronger product-mix management in Advanced Materials to maintain steady performance
- Stable and consistent Cement quality supported by process-efficiency measures
- Enhanced customer engagement and feedback loops, reinforcing end-use alignment
- Continued compliance with global ISO standards across key facilities



## Increasing usage of alternative and bio-based feedstocks for carbon and resin manufacturing

### Objective

The declining availability of coal tar and C9 raw material streams, particularly in Europe, posed a strategic risk to the long-term availability of raw materials for our Carbon and Advanced Materials businesses. To maintain continued production and material performance, it became essential to identify alternative feedstocks that could be reliably integrated into our existing manufacturing processes. Our objective was to broaden the range of usable raw materials by moving beyond direct substitution and developing conversion-based solutions.

### Actions taken

- Tested biogenic raw materials and recycling streams as alternatives to coal tar in carbon distillation
- Explored alternative aromatic raw material streams from petrochemical, biogenic and recycling sources

- Developed chemical and thermal processes to convert aromatic byproduct streams into usable feedstocks
- Increased the use of styrene and  $\alpha$ -methyl styrene to replace declining C9 monomers in resin formulations
- Launched NOVARES® SN and ST resin product families based on modified monomer composition

### Impact

These initiatives ensured ready access to suitable feedstocks, streamlined the production of carbon precursor materials, and delivered resin products with performance comparable to traditional C9-based grades across adhesive, rubber, tyre and coatings applications.

Case study

## Sustainable manufacturing

Across our business segments, we are improving energy efficiency, transitioning to cleaner power, adopting environmentally responsible raw materials and strengthening resource circularity. Our efforts are aligned to global sustainability expectations while ensuring long-term operational resilience and efficient manufacturing performance.

### Energy-efficient operations

- Waste-heat recovery systems
- Solar power projects
- Annual energy audits

### Certified sustainable offerings

Our Advanced Materials portfolio includes ISCC-Plus certified products, reflecting our commitment to verified sustainable sourcing and transparent value-chain practices.

## Key developments

### Greater energy recovery through higher throughput (Zelzate Advanced Materials plant)

- Increased phthalic anhydride production volumes improved energy efficiency
- Higher throughput enabled more waste-heat steam generation for internal use
- Reduced reliance on external power sources and lowered per-unit energy intensity

### Active transition toward bio-based raw materials

- R&D teams are evaluating multiple bio-based solid and liquid inputs across all segments
- Conducting internal trials, as well as collaborating with customers and suppliers
- Adoption will be aligned to customer industry readiness for greener inputs

### Solar plant capacity addition

In 2025, RAIN strengthened its commitment to energy efficiency and sustainable operations through the expansion of its solar power facility in Suryapet, India, initiated by our Cement segment. The project involves a 2.10 MW capacity addition to the existing solar installation.

## Green power transition target

### By 2028, our Cement segment aims to increase the share of green power to 45-50% of its total electricity consumption

This transition is supported by expanded solar generation & sourcing and greater utilisation of Waste-Heat Recovery (WHR) systems, helping stabilise energy costs and lowering the Carbon intensity of our growing operations.

