



Carbon

Our Carbon business segment transforms by-products of other industries into high-value, carbon-based products that are critical raw materials for the aluminium, graphite, carbon black, wood preservation, titanium dioxide and refractory

industries, among others. With operations in Europe, India and North America, we are the world's largest producer of coal tar pitch (CTP) and second-largest producer of calcined petroleum coke (CPC).

**2.53** Mn MT

Sales volume

₹98,249 Mn

Revenue from operations


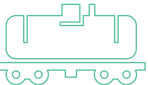

68%

Contribution to consolidated revenue

22%

Operating margin

Our carbon products

Products	Raw materials used	Manufacturing process	Uses	Production Facilities
Calcined petroleum coke (CPC) 	Green petroleum coke, a by-product of crude oil refining	Using rotary-kiln and vertical-shaft technologies in a high-temperature process called calcining, which removes moisture and volatile matter from GPC	Raw material in the production of primary aluminium, steel and titanium dioxide	8 production units with combined production capacity of 2.4 MTPA in North America and Asia
Coal tar pitch (CTP) 	Coal tar, a by-product of metallurgical coke, used in the iron and steel industry	Produced through distillation of coal tar. Distillation is a process that separates the components of a product based on different boiling points	Raw material used by the aluminium, graphite and refractory industries	5 coal tar distillation plants with combined capacity of 1.3 MTPA in Europe and North America
Other carbon products (creosote oil, carbon black oil and others) 	Same as CTP	Same as CTP	Raw materials used by the wood treatment, carbon black, construction and other industries	

Our global network of plants and flexible logistics infrastructure helped maintain our raw material sources to ensure steady calcined petroleum coke deliveries to our customers. This allowed us to continue producing CPC despite tight green

petroleum coke availability. This was driven by continued softness in refinery production of automobile and aviation fuels due to the impact of the pandemic in some parts of the world.

BUSINESS SEGMENT REVIEW - CARBON

Operational highlights of 2021

- Commissioned the vertical-shaft calciner in India and completed its first sale of CPC
- Commissioned the anhydrous carbon pellet production facility in the US
- Recovered quickly at the Chalmette, Gramercy, Norco and Purvis calcination and energy facilities in the US following Hurricane Ida in September





Market overview

- Primary industries consuming RAIN's CPC and CTP – aluminium, titanium dioxide and steel – saw vigorous recovery in 2021
- Aluminium and steel industries in the rest of world, excluding China expanded at their fastest rate in a decade
- The escalation of energy prices in Europe significantly impacted segment performance during the second half of the year, partially offset by our non-European operations and the ability to pass through costs
- There is an ongoing effort to maintain a favourable position on the cost curve versus our competitors. This includes activities to reduce our energy costs through improved energy efficiency and the utilisation of alternative fuels while also working to contain and reduce our CO₂ footprint
- We are continuing to roll out several key initiatives to optimise and rationalise our global production locations and supply chain. We are focused on driving efficiency improvements and targeting cost reductions across all areas of the business to improve our bottom line and maintain our business' strength for the future.

Outlook

The Carbon segment is expected to enjoy continued strong volumes in the coming year. Calcined petroleum coke and coal tar pitch sales should continue to benefit from robust demand in the aluminium industry. In addition, we anticipate that demand for CPC within the titanium dioxide industry will remain solid. CTP volumes should also remain strong due to increasing demand for engineered products such as CARBORES® and PETRORES®. Beyond CTP, we expect ongoing demand for our other carbon distillation products to remain solid.

At the same time, the availability of high-quality raw materials continues to be a challenge – especially low-sulphur, anode-grade GPC for our calcination business. Aluminium smelters understand that this situation is not likely to improve, and they are finding ways to work with our Company and adapt to relaxed specifications to the maximum extent possible. In terms of GPC pricing, decreased Chinese GPC production has prompted China to import more, triggering increased competition and higher costs on the seaborne market. We will be watching the Chinese production and

energy situation, which could continue to experience volatility well into 2022. As with calcination, our distillation operations are dealing with an ongoing challenge of securing coal tar in a very tight global market and facing the resultant cost increases.

During 2022, we also expect that our new vertical-shaft calciner in India and anhydrous carbon pellet production facility in the US will begin to provide the return on investment. In late 2021, CPC production at the Indian calciner began to ramp up, and we are preparing to export our first shipment of shaft CPC during the first half of 2022. Looking ahead, we continue to work with Indian authorities to secure a GPC import allocation for the vertical-shaft calciner. We also plan to ship a trial blend of calcined ACP and CPC to a major global aluminium industry customer during the first half of 2022. In the months ahead, in addition to gaining customer feedback from this initial shipment, we will continue to learn and optimise the production process for this new material. With additional operational and testing experience, we will continue to fine-tune the ACP throughput and production costs.