Principle 06

Environmental Responsibility

Our commitment to reducing environmental impact is evident in our resource efficiency, emissions reduction and renewable energy investments. Through initiatives like waste-heat recovery, solar power generation and a focus on recycling and resource optimisation, we demonstrate our dedication to sustainable manufacturing and environmental stewardship.

Material Topics

- Climate Action
- Environmental Management, Regulations and Compliance
- Circularity and Innovation

Capitals Impacted

- Natural Capital
- Social and Relationship Capital

Stakeholders

- Vendors and Suppliers
- Communities

Key highlights of CY 2024

0.42 MT tCO_2e
Avoided due to waste-heat recovery

~0.28 Mn MT
Of total waste recycled

Contribution to SDGs

Essential Indicators

1. Details of total energy consumption (in Joules or multiples) and energy intensity:

Parameter	CY 2024	CY 2023
From renewable sources		
Total electricity consumption (A)	121 TJ	111 TJ
Total fuel consumption (B)	0	0
Energy consumption through other sources (C)	0	0
Total energy consumed from renewable sources (A+B+C)	**121**	**111**
From non-renewable sources		
Total electricity consumption (D)	2,606 TJ	2,823 TJ
Total fuel consumption (E)	10,097 TJ	11,005 TJ
Energy consumption through other sources (F)	0	173 TJ
Total energy consumed from non-renewable sources (D+E+F)	12,703	14,001 TJ
Total energy consumed (A+B+C+D+E+F)	**12,823**	**14,112**
Energy intensity per Rupee of turnover (Total energy consumed / Revenue from operations)	0.00000008	0.000000075
Energy intensity per Rupee of turnover adjusted for Purchasing Power Parity (PPP) (Total energy consumed / Revenue from operations adjusted for PPP)	0.00002	0.0000062
Energy intensity in terms of physical output	0.0023 TJ / metric ton of products produced	0.0024 TJ / metric ton of products produced
Energy intensity (optional) – the relevant metric may be selected by the entity	NA	NA

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y /N) If yes, name of the external agency

Yes, independent assessment for all environmental KPIs: External certifier DQS.

2. Does the entity have any sites / facilities identified as Designated Consumers (DCs) under the Performance, Achieve and Trade (PAT) Scheme of the Government of India?:

No

If yes, disclose whether targets set under the PAT scheme have been achieved. In case targets have not been achieved, provide the remedial action taken, if any:

Not applicable

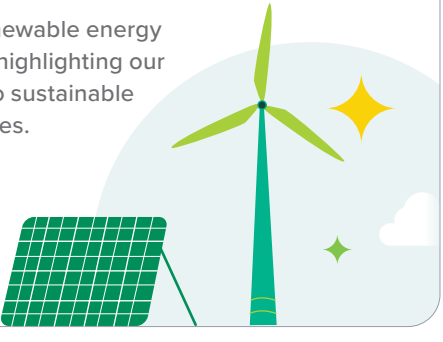
3. Provide details of the following disclosures related to water:

Parameter	CY 2024	CY 2023
Water withdrawal by source (in kilolitres)		
(i) Surface water	1,319,255	11,67,024
(ii) Groundwater	1,889,348	28,53,037
(iii) Third party water	1,734,529	15,35,636
(iv) Seawater / desalinated water	2,137,262	12,77,933
(v) Others	59,533	26,108
Total volume of water withdrawal (in kilolitres) (i+ii+iii+iv+v)	**7,139,927**	**68,59,738**
Total volume of water consumption (in kilolitres)	**3,703,718 KL**	Water withdrawal comprises the water taken from surface water bodies (fresh and saltwater), groundwater aquifers or from third-party suppliers. However, the discharge additionally comprises the sources storm- and rainwater. Therefore, water consumption calculated from withdrawal minus discharge is not a representative value and thus not included as an indicator in the current assessment.
Water intensity per Rupee of turnover (Total water consumption / Revenue from operations)	0.000024	NA as water consumption is not calculated
Water intensity per Rupee of turnover adjusted for Purchasing Power Parity (PPP) (Total water consumption / Revenue from operations adjusted for PPP)	0.0050	NA as water consumption is not calculated
Water intensity in terms of physical output	1.26 (m^3 total water withdrawal / metric ton production volume)	1.23 (m^3 total water withdrawal / metric ton production volume)
Water intensity (optional) – the relevant metric may be selected by the entity	NA	NA

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency.

Yes, independent assessment for all environmental KPIs: External certifier DQS.

9%
increase in renewable energy consumption, highlighting our commitment to sustainable energy practices.



4. Provide the following details related to water discharged:

Parameter	CY 2024	CY 2023
Water discharge by destination and level of treatment (in kilolitres)*		
(i) To surface water	1,442,692	2,453,682
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
(ii) To groundwater	0	0
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
(iii) To seawater	1,130,078	721,349
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
(iv) Sent to third parties	801,130	2,907,817
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
(v) Others	NA	0
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
Total water discharged (in kilolitres)	**3,373,900**	**6,082,848**

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y / N)
If yes, name of the external agency

Yes, independent assessment for all environmental KPIs: External certifier DQS.

Yes, independent assessment for all environmental KPIs: External certifier DQS.

5. Has the entity implemented a mechanism for Zero Liquid Discharge? If yes, provide details of its coverage and implementation:

Yes (at selected sites)

Carbon & Advanced Materials segment: There is no mechanism of Zero Liquid Discharge (ZLD) except for the two Carbon segment plants in India, where ZLD mechanism is implemented.

Cement segment: We have Zero Liquid Discharge at our cement plants. From the overhead tank through pipeline water is pumped to bearings [Note: After cooling, the bearing water will come to water cooling sump and against it will go to heat exchangers, the same water is collected in a sump, further cooled in the cooling tower and stored in soft water tank pumped to overhead tank for recycling.] The same was used for cooling the bearings. Installed lotus system in cooling tower discharge for water softening. There is no liquid discharge in the above system. Colony STP outlet treated water is used for colony plantation and green belt development. Treated water from STP is also being used for dust control. Demineralised Plant effluent water, boiler blow down and auxiliary cooling tower water is reused in process and green belt development.

6. Please provide details of air emissions (other than GHG emissions) by the entity, in the following format:

Parameter	Please specify unit	CY 2024	CY 2023
NO_x *	Metric tons	3,937	3,383
SO_x **	Metric tons	16,208	13,033
Particulate matter (PM) ***	Metric tons	730	887
Persistent organic pollutants (POP)	Nil	NA	NA
Volatile organic compounds (VOC) ****	Metric tons	228	237
Hazardous air pollutants (HAP) *****	Metric tons	173	147
Others – please specify	Nil	NA	NA

* Data available for all applicable sites, except Castrop-Rauxel, Kedzierzyn-Kozle and Visakhapatnam
** Data available for all applicable sites, except Castrop-Rauxel and Kedzierzyn-Kozle
*** Data available for all applicable sites, except Castrop-Rauxel, Zelzate and Kedzierzyn-Kozle
**** Data available for all applicable sites, except Castrop-Rauxel, Duisburg, Kedzierzyn-Kozle, Visakhapatnam and Atchutapuram
***** Data available for all applicable sites, except Castrop-Rauxel, Zelzate and Visakhapatnam

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency.

Yes, independent assessment for all environmental KPIs: External certifier DQS.

7. Provide details of greenhouse gas emissions (Scope 1 and Scope 2 emissions) & its intensity:

Parameter	Unit	CY 2024	CY 2023
Total Scope 1 emissions* (Break-up of the GHG into CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3, if available)	Metric tonnes of CO_2 equivalent	2,899,852	30,98,543* (Only CO_2, CH_4 and N_2O; excluding mobile combustion
Total Scope 2 emissions (Break-up of the GHG into CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3, if available)	Metric tonnes of CO_2 equivalent	154,800	183,069
Total Scope 1 and Scope 2 emission intensity per rupee of turnover (Total Scope 1 and Scope 2 GHG emissions / Revenue from operations)	Metric tonnes of CO_2 equivalent / Rupee of turnover	0.000020	0.000018
Total Scope 1 and Scope 2 emission intensity per rupee of turnover adjusted for Purchasing Power Parity (PPP) (Total Scope 1 and Scope 2 GHG emissions / Revenue from operations adjusted for PPP)	Metric tonnes of CO_2 equivalent / Rupee of turnover adjusted for PPP	0.0041	0.00149
Total Scope 1 and Scope 2 emission intensity in terms of physical output	Metric tons CO_2e / metric ton produced	0.54	0.5595
Total Scope 1 and Scope 2 emission intensity (optional) – the relevant metric may be selected by the entity		-	-

*Only the following greenhouse gases are included in our assessment: CO_2, CH_4 and N_2O.

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency.

Yes, independent assessment for all environmental KPIs: External certifier DQS.

8. Does the entity have any project related to reducing Green House Gas emission? If Yes, then provide details:

Over the recent years the company has developed various concepts and measure to reduce RAIN's GHG emissions including the following:

Waste heat recovery and avoided emissions

RAIN's Carbon & Advanced Material segments:

- Significant work on GHG reduction opportunities (ACP technology, bio-chars and bio-oils)
- Monitoring emissions and energy consumption
- Improvement of steam generation and consumption (overhaul of steam pipeline network at Castrop-Rauxel)
- Energy audits and related energy saving initiatives (at Visakhapatnam, India and all US sites)
- Using state-of the art technology (techno-economic study of CCUS, furnace replaced at tar distillation at Castrop-Rauxel which reduced NO_x within limit and also increased energy efficiency)
- Quantifying and understanding emission sources: CEMS equipped with CO_2 analysers at 3 US sites, efforts being made to make CO_2 calculations through mass balance, enhancing existing CEMS's CO_2 measurement capabilities at Indian calcination plants)
- Greenhouse gas generation depends on the amount of natural gas consumed. Commissioning of the second pitch cooler under the TDU.4 project increased the temperature of oil in the HTF system and reduced natural gas consumption by 50,000 m^3 per month (at Russian site)

RAIN's Cement segment:

- Use and identification of alternative fuels
- Use of renewable energy by way of Installation / RECs / PPA's
- Increasing PPC production
- Energy management system
- Energy management policy
- Continuous monitoring
- Variance analysis
- Improvement area identification
- Resource allocation & project implementation
- Awareness, learning & development

9. Provide details related to waste management by the entity, in the following format:

Parameter	CY 2024	CY 2023
Total waste generated (in metric tonnes)	Not assessed	Not assessed
Plastic waste (A)	Not assessed	Not assessed
E-waste (B)	Not assessed	Not assessed
Bio-medical waste (C)	Not assessed	Not assessed
Construction and demolition waste (D)	Not assessed	Not assessed
Battery waste (E)	Not assessed	Not assessed
Radioactive waste (F)	Not assessed	Not assessed
Other hazardous waste. Please specify, if any. (G)	138,719 metric tons	29,204 metric tons
Other Non-hazardous waste generated (H). Please specify, if any. (Break-up by composition i.e., by materials relevant to the sector)	206,134 metric tons	79,093 metric tons
Total (A+B+C+D+E+F+G+H)	**344,853 metric tons**	**108,296 metric tons**
Waste intensity per Rupee of turnover (Total waste generated / Revenue from operations)	0.0000022	0.000000597
Waste intensity per Rupee of turnover adjusted for Purchasing Power Parity (PPP) (Total waste generated / Revenue from operations adjusted for PPP)	0.00046	0.000049

Parameter	CY 2024	CY 2023
Waste intensity in terms of physical output	0.061 (metric ton total waste / metric ton production volume)	0,0185 (metric ton total waste / metric ton production volume)
Waste intensity (optional) – the relevant metric may be selected by the entity	-	-
For each category of waste generated, total waste recovered through recycling, re-using or other recovery operations (in metric tonnes)		
Category of waste		
(i) Recycled	279,905 metric tons	65,410 metric tons
(ii) Re-used	4,277 metric tons	0 metric tons
(iii) Other recovery operations	12,782 metric tons	9,137 metric tons
Total	**296,964 metric tons**	**74,547 metric tons**
For each category of waste generated, total waste disposed by nature of disposal method (in metric tonnes)		
Category of waste		
(i) Incineration	36,966	11,126
(ii) Landfilling	4,286	7,619
(iii) Other disposal operations	7,388	5,964
Total	**48,640**	**24,709**

Note: Indicate if any independent assessment / evaluation / assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency.

Yes, independent assessment for all environmental KPIs : External certifier DQS.

10. Briefly describe the waste management practices adopted in your establishments. Describe the strategy adopted by your company to reduce usage of hazardous and toxic chemicals in your products and processes and the practices adopted to manage such wastes:

Our production processes aim to achieve the highest resource efficiency in converting as much raw material as possible into products and thus, minimising waste volumes. We implemented multiple activities across our global operations that are described in the non-statutory section of this report.

All of our facilities go through a chemical approval process to reduce / eliminate employee exposure to hazardous chemicals while reducing or eliminating environmental concerns. The process identifies chemicals reviewed and approved by the responsible official and their designees.

In our Carbon segment's calcination facilities for example, a chemical approval form will be completed by the site and submitted to the SHE Manager, North America for approval. The form must state how the chemical will be used and whether or not it will replace an existing chemical. A Safety Data Sheet must also be provided listing any hazards associated with the chemical.

Purvis: There is a relatively low amount of hazardous and toxic chemicals. Our main practices are around handling used batteries, aerosols and used oil. Each have designated outlets designed to properly handle the waste streams.

Robinson: There is a relatively low amount of hazardous and toxic chemicals. Our main practices are around handling used batteries, aerosols and used oil. Each have designated outlets designed to properly handle the waste streams.

Lake Charles: There is a relatively low amount of hazardous and toxic chemicals. Our main practices are around handling used batteries, aerosols and used oil. Each have designated outlets designed to properly handle the waste streams.

Chalmette: There is a relatively low amount of hazardous and toxic chemicals. Our main practices are around handling used batteries, aerosols and used oil. Each of which have designated outlets designed to properly handle the waste streams.

Gramercy: We do not use many toxic chemicals at Gramercy. Waste controls are used at the plant which include batteries, used oils and aerosol cans. We also have multiple waste spill stations throughout the plant to ensure proper disposal is practiced.

Castrop-Rauxel: Waste is collected, separated and disposed of at a central location according to its type and characteristics. To ensure this, waste is categorised and collected separately in accordance with the European Waste Catalogue and the German Waste Catalogue Ordinance (AVV). The focus is on waste-free production, with waste primarily arising from renovation and construction measures.

Hamilton: Hazardous wastes are registered with Ontario's RPRA system and follow requirements for manifesting each shipment. New wastes are tested to determine if they are hazardous. Movement offsite of hazardous wastes follow strict procedures to ensure compliance with regulations such as use of registered carriers, receiving sites, manifesting of shipments, classification of waste streams.

With respect to use of non-feedstock hazardous and toxic chemicals we use some that are needed for running the processes (e.g. Hydrogen peroxide).

Atchutapuram: All waste is collected, segregated and disposed out to authorised waste handler as per the local State Pollution Control Board.

Visakhapatnam: All the waste are collected, segregated and disposed out to authorised waste handler as per the local State Pollution Control Board.

Zelzate: We aim to prevent waste at the source / condensate as much as possible in the distillation process / find new techniques to generate value out of waste.

Nandyal and Suryapet: Since January 2021, we have implemented a waste management system at our two cement plants. Both plants have a township with close to 200 houses, from which waste is collected using electric vehicles and transported to a dedicated waste management unit within the plant, where it is separated into wet and dry categories. Wet waste, such as food scraps and dry leaves, is composted using coco peat and then used as a growing medium or substrate for growing plants inside the plant. Dry waste, including paper, plastics and glass, is responsibly disposed of or used as fuel in the kiln. This practice enhances sustainability and promotes a cleaner environment around the plant premises.

Further minimising our environmental footprint is a key element of RAIN's strategy

11. If the entity has operations / offices in / around ecologically sensitive areas (such as national parks, wildlife sanctuaries, biosphere reserves, wetlands, biodiversity hotspots, forests, coastal regulation zones, etc.) where environmental approvals / clearances are required, please specify details in the following format:

S. No.	Location of operations /offices	Type of operations	Whether the conditions of environmental approval / clearance are being complied with? (Y / N) If no, the reasons thereof and corrective action taken, if any.
1	Chalmette	Calcination	Yes
2	Gramercy	Calcination	Yes
3	Lake Charles	Calcination	Yes
4	Zelzate	Coal tar and PFO distillation, benzol distillation and production of PA	Yes (an impact assessment is done extensively in the environmental effect report (MER) and more limited in every permit application where an impact is possible)
5	Hamilton	Coal tar and petroleum distillation	Yes (We applied for a renewal of our Site Specific Standard for benzene and B(a)P and our ECA (Operating Permit) which is under review by MECP Ontario

12. Details of environmental impact assessments of projects undertaken by the entity based on applicable laws, in the current financial year:

Name and brief details of project	EIA Notification No.	Whether conducted by independent external agency (Yes / No)	Results communicated in public domain (Yes / No)	Relevant Web link
1	Zelzate: Last permit was applied in Feb 2024	OMV_2023101920_EA	Permit was approved on February 1, 2024	Weblink
2	Zelzate: Currently a permit application is ongoing	OMV_2024095095	Permit application was submitted on the November 25, 2024	Weblink
3	Chalmeete 316(b) Project for LPDES Permit Renewal	2023 year	Yes but not available online yet.	Weblink

13. Is the entity compliant with the applicable environmental law / regulations / guidelines in India; such as the Water (Prevention and Control of Pollution) Act, Air (Prevention and Control of Pollution) Act, Environment Protection Act and rules thereunder (Y / N). If not, provide details of all such non-compliances, in the following format:

Yes. The Company has complied with the applicable environmental law / regulations / guidelines in India; such as the Water (Prevention and Control of Pollution) Act, Air (Prevention and Control of Pollution) Act, Environment Protection Act and rules thereunder.

S. No.	Specify the law / regulation / guidelines which was not complied with	Provide details of the non-compliance	Any fines / penalties / action taken by regulatory agencies such as pollution control boards or by courts	Corrective action taken if any
	NA	NA	NA	NA

Leadership Indicators

1. Water withdrawal, consumption and discharge in areas of water stress (in kilolitres):

For each facility / plant located in areas of water stress, provide the following information:

(i) Name of the area: Production sites that operate in areas with water stress are Hamilton (high (40-80%)), Zelzate (extremely high (>80%), Nandyal (extremely high (>80%)) and Suryapet (high (40-80%))

(ii) Nature of operations: Manufacturing of Calcined Petroleum Coke, Coal Tar Pitch and Cement.

(iii) Water withdrawal, consumption and discharge in the following format:

Parameter	CY 2024	CY 2023
Water withdrawal by source (in kilolitres)		
(i) Surface water	749,397	944,378
(ii) Groundwater	153,846	125,881
(iii) Third party water	330,803	322,419
(iv) Seawater / desalinated water	0	0
(v) Others	18,087	16,038
Total volume of water withdrawal (in kilolitres)	1,252,133	1,408,716
Total volume of water consumption (in kilolitres)	880,426	Water withdrawal comprises the water taken from surface waterbodies (fresh and saltwater), groundwater aquifers or from third party suppliers. However, the discharge additionally comprises the sources storm- and rainwater. Therefore, water consumption calculated from withdrawal minus discharge is not a representative value and thus not included as an indicator in the current assessment.
Water intensity per rupee of turnover (Water consumed / turnover)	0.00001	Not assessed, see comment above
Water intensity (optional) – the relevant metric may be selected by the entity	0.36 (m3 water withdrawal / metric ton of products produced)	0.40 (m^3 water withdrawal / metric ton of products produced)
Water discharge by destination and level of treatment (in kilolitres)		
(i) Into Surface water	2,99,130	2,82,760
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA
(ii) Into Groundwater	0	0
- No treatment	0	0
- With treatment – please specify level of treatment	0	0
(iii) Into Seawater	0	0
- No treatment	0	0
- With treatment – please specify level of treatment	0	0
(iv) Sent to third parties	72,576	133,313
- No treatment	NA	NA
- With treatment – please specify level of treatment	NA	NA

Parameter	CY 2024	CY 2023
(v) Others	0	0
- No treatment	0	0
- With treatment – please specify level of treatment	0	0
Total water discharged (in kilolitres)	**3,71,706**	**4,16,073**

Sites in water stress: Production sites that operate in areas with water stress are Hamilton (high (40-80%)), Zelzate (extremely high (>80%), Nandyal (extremely high (>80%)) and Suryapet (high (40-80%))

Note: Indicate if any independent assessment / evaluation /assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency.

Yes, independent assessment for all environmental KPIs: External certifier DQS. 49th Annual Report 2023 183

At RAIN, we recognise the critical challenge of water stress, particularly at our production sites located in water-scarce regions such as Hamilton (high stress), Zelzate, Nandyal and Suryapet (extremely high stress). To address this, we have implemented strategic water management initiatives. Through the Purvis project, focused on non-contact cooling water reduction, we've successfully reduced our water consumption by 39%, demonstrating our proactive approach to managing water resources in areas facing the greatest environmental pressures.

2. Please provide details of total Scope 3 emissions & its intensity, in the following format:

Parameter	Unit	CY 2024	CY 2023
Total Scope 3 emissions (Break-up of the GHG into CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3, if available)	Metric tonnes of CO_2 equivalent	Carbon and Advanced Materials segments ~11.60 Mn tCO_2e Cements segment ~0.18 Mn tCO_2e	Not Assessed
Total Scope 3 emissions per rupee of turnover	-	Not Assessed	Not Assessed
Total Scope 3 emission intensity (optional) – the relevant metric may be selected by the entity	-	Not Assessed	Not Assessed

Note: Indicate if any independent assessment / evaluation /assurance has been carried out by an external agency? (Y / N) If yes, name of the external agency. **No.**

3. With respect to the ecologically sensitive areas reported at Question 10 of Essential Indicators above, provide details of significant direct & indirect impact of the entity on biodiversity in such areas along-with prevention and remediation activities:

For the Chalmette 316(b) project, the Mississippi Roiver Intake velocity was found to be less then the 0.5ft/s impact threshold on marine life in the river.

Currently, biodiversity is not a material topic for RAIN. We consider biodiversity a topic of increasing relevance. This is why we have started conducting impact studies for some of our sites.

Zelzate: The impact study done in the last permit application showed no significant impact on the biodiversity.

4. If the entity has undertaken any specific initiatives or used innovative technology or solutions to improve resource efficiency, or reduce impact due to emissions / effluent discharge / waste generated, please provide details of the same as well as outcome of such initiatives, as per the following format:

Sl. No.	Initiative undertaken	Details of the initiative (Web-link, if any, may be provided along-with summary)	Outcome of the initiative
	Purvis: Once through non-contact cooling water reduction	Reduce volume of water used for "once through non-contact cooling" to reduce the overall volume of water being pulled from the water well.	Reduced volume by 39%
	Norco: Energy efficiency	– Installation of VFD drive air compressor – Installation of energy monitoring equipment to determine inefficiencies. – Continually updating bulbs to LED lighting.	Reduced energy consumption. Ability to determine if equipment is performing efficiently or needs to be upgraded.
	Gramercy: Energy efficiency	Energy monitoring equipment installed to precisely monitor where the bulk of the energy is consumed to improvements can be made.	Reduced energy consumption, ability to determine if equipment is performing efficiently or needs to be upgraded.
	Chalmette: Energy efficiency	Energy monitoring equipment to determine inefficiencies	Reduced energy consumption, ability to determine if equipment is performing efficiently or needs to be upgraded.
	Castrop-Rauxel: Coal Tar Distillation (CTD) furnace project	With installation of furnace D21 the furnace project for the CTD is completed. In the CTD, the specific natural gas consumption of the system is determined by two influencing factors: 1. throughput of the distillation plant 2. the proportion of distillation heat via steam in the falling film evaporator. In order to be able to make a reliable statement about the efficiency of the furnaces, these two influencing factors must be excluded. For this purpose, this key figure was determined for a throughput of 50-55 t/h feed. The falling film evaporator always operates at these throughputs.	Reduction in the consumption of energy vs the old setup (after reducing steam temperature (ffv): 0,247 (MWh/t) after D20 (Jan-Aug23): 0,218 (MWh/t) after D20 + D13 (MTD 10Oct23): 0,211 (MWh/t) Q3 CY 2024 repl. old K22/K21 by new D21: 0,206 (MWh/t)
	Castrop-Rauxel: Efficiency steam generation & network	Improving the efficiency of steam generation and steam quantity recording – The gas to steam factor (MWh(gas) to 1 MWH (steam))of the energy centre was reduced from 1.44 in CY 2023 to 1.40 YTD 11/24. – Replacement of desalination valves – Reduction of the steam boiler reserve – Optimisation of the feed water preheating – Shutdown of the gas turbine – Shutting down and dismantling no longer required segments of the steam network (approx.. 2.300 m of piping) The combined effect of the individual measures, some of which were implemented simultaneously, led to a reduction in the amount of unallocated steam. The improvement from CY 2024 to CY 2021 was around 44 GWh. In relation to total steam production, the proportion of unallocated steam fell from 25% in 2021 to 8% in YTD 2024.	

Sl. No.	Initiative undertaken	Details of the initiative (Web-link, if any, may be provided along-with summary)	Outcome of the initiative
	Castrop-Rauxel: Steam condensers pitch storage	By installing of 'Venturi' condensers, the steam consumption of the EPT could be reduced by approx. 4 GWh/a.	Saving of approx. 4 GWh/a
	Castrop-Rauxel: Steam condensers TAN	Venturi steam condensers are currently being installed in the tank wagon heating area of the tar preparation plant. Steam savings of approx. 20% are expected.	Approx. 2 GWh/a savings are estimated
	Castrop-Rauxel: Waste water recirculation	By treating the 'AW4' wastewater stream with the help of a water treatment plant, we were able to stop using surface water for steam generation. We now use treated waste water for steam generation and cooling towers.	
	Atchutapuram: Supporting fuel requirement for the running VSKs made zero	Individual VSK shaft draughts are being adjusted continuously to maintain the temperatures without using the supporting fuel.	Reduced LPG consumption to zero
	Visakhapatnam	Conveyor belt BC-4, radiator along with cooling fan was replaced with a lesser kW motor (0.75 kW from existing 3.75kW drive) as suggested by OEM.	Energy conservation of 36 units per day is achieved from October 2024 (considering 12 hours operation per day).
	Duisburg: Trials for ozonolisation of waste water to remove organic components	– Trials are running since 12/24 – First results are expected Q1 2025	Ongoing trials
	Duisburg: Wastewater reducing project	After a visual inspection, clean surface water from the tank farms can now be discharged into the plant's own sewer system and from there into the neighbouring watercourse. For this purpose, the surface water was separated from the slop system. This has greatly reduced the amount of contaminated wastewater.	Reduction of wastewater volume and thus disposal costs.
	Duisburg: Xylene-recycle-project	A cooling system was added to the resin distillation process to reduce the xylene content in the output. The xylene can therefore be recovered.	Reduction in the cost of procuring new xylene and saving resources.
	Duisburg: Liquid resin distillation via DSV	Instead of distilling liquid resin in a vacuum steam stripping process, campaigns of these resins are distilled via FFE /TFE, a water free process. This avoids the need to dispose of process water.	Process implemented and significant waste avoidance
	Zelzate: Air emissions	Renewal of 40W703 in the waste gas incinerator BTX	Better SO_3 to H_2SO_4 conversion
	Zelzate: Air emissions	Renewal of catalyst in the waste gas incinerator BTX	Better SO_2 to SO_3 conversion
	Zelzate: Energy efficiency + noise	Renewal of internal parts cooling tower BTX + installing frequency drives	Better control and adjustment of the energy needs of the cooling system BTX
	Zelzate: Energy	New electrical charging stations (20 pieces) for electric vehicles	Electrification of cars

Sl. No.	Initiative undertaken	Details of the initiative (Web-link, if any, may be provided along-with summary)	Outcome of the initiative
	Zelzate: Waste water	Renewal of resins to absorb BTEX / phenol in waste water	Guarantee to respect legal limits of emitting waste water.
	Suryapet and Nandyal: Fixing taps, faucets, showers, health faucet with water aerators.	To modify high flow taps, faucets, showers & health faucet to a low flow system.	Lower and more efficient water usage for all domestic applications without any compromise in comfort. Approximately 75% reduction in domestic water usage in both plants and colonies.
	Suryapet and Nandyal: Converting Water based urinals to waterless urinals		100% reduction in water usage for urinals installed in plant.
	Suryapet and Nandyal: Installation of water bag inside flush tanks		Reduction of 30% water usage during flushing.
	Suryapet and Nandyal: Installation of centrifuge system for oil filtration		Increasing life of used oil & reducing oil waste generation.
	Hamilton: Abatement Plan- air emissions reduction	Created a site specific LDAR programme to capture more fugitive emission sources. Captured more components by having a reduced leaker threshold, reduced % benzene service. – Tar / Oil storage tanks: implemented tank PVRV VOCs emissions monitoring, repair, maintenance and replacement programme. – Storage tank inspection, repair, replacement. – Created groups of storage tanks on the FGI system to provide better emissions control. – Implemented pitch pump upgrades. – Installed a new pitch cooler to improve control of pitch loading temperatures and reduce steam usage. – Did a pilot trial on truck loading automation. – Installed three continuous VOC online monitors and weather station to identify and eliminate fugitive benzene emission sources.	A 4-fold increase in number of components in the programme.
	Hamilton: Waste Water Quality	Installed a vacuum pumps to replace steam ejectors of HSPP – Improved reliability of distillation units vacuum pumps to avoid operation of steam ejector	– Reduced steam consumption – Reduce waste water quantity and contaminant loadings (CN)
	Hamilton: Waste recycling	For projects involving equipment cleaning consider recycling of recovered residues, rinses back to the process where possible. – Set objective on recovery of potential tar spillage at truck unloading.	– Estimate 17% reduction vs CY 2023
	Hamilton: Reduce Water Consumption	Installed a reverse osmosis system to reuse treated stormwater as boiler feed water vs water from the City of Hamilton.	Commissioned in 2024 – Reduction of water consumption due to recycling and better-quality leads to increased cycle rates of the boilers. Less blow down and less chemical consumption. – Reduced plant effluent
	Hamilton: Secondary Containment	Installed secondary containment in the tar /oil tank farm	Completed in 2024

Sl. No.	Initiative undertaken	Details of the initiative (Web-link, if any, may be provided along-with summary)	Outcome of the initiative
	Hamilton: Raw Material Substitution	Continued to implement use of petroleum feedstocks in P3 creosote production, trials on LPSB production	
	Hamilton: Energy Consumption	Conducted a steam system audit and performed related repairs Installed air preheating for the new unit process heater Above mentioned vacuum pumps to replace steam ejectors Pitch cooler (mentioned above) Optimised process condition (e.g. reduced A2/A102 feed temperature by 10 degrees C)	15-20% lower natural gas consumption. Higher average condensate return rates

5. Does the entity have a business continuity and disaster management plan? Give details in 100 words / web link:

We have emergency preparedness plans in place for each site to address any external and internal disasters.

These plans have a clear focus on minimising exposure with hazardous situations and cover various scenarios with clear assignments of responsibilities. This also includes business continuity measures per business segment.

6. Disclose any significant adverse impact to the environment, arising from the value chain of the entity. What mitigation or adaptation measures have been taken by the entity in this regard?:

No adverse impact to the environment.

7. Percentage of value chain partners (by value of business done with such partners) that were assessed for environmental impacts:

Nil