Joint Report

on Occupational Health, Safety, and Environment (OHSE)

ORLEN Unipetrol

Contents

1. Introduction to the ORLEN Unipetrol Group

The Group specialises in refining and petrochemical production and sales in the Czech Republic and the Central European region. The Group companies mainly produce and sell refinery products, chemical and petrochemical products, polymers and specialty chemicals. The Group also operates its own transport services and funds its own research and development. ORLEN Unipetrol is the leading refining and petrochemical group in the Czech Republic and a major actor in Central and Eastern Europe. The Group focuses on three strategic business segments:

- oil refining and wholesale of refinery products
- petrochemical and agrochemical production
- retail sale of motor fuels

ORLEN Unipetrol is the 100% owner of the following companies:

- ORLEN Unipetrol RPA – a producer of and trader in refinery, petrochemical and agrochemical products, the largest oil processor in the Czech Republic for a wide range of products with a total annual capacity of 8.7 million tonnes. The ORLEN Benzina petrol station network and Polymer Institute Brno are also part of ORLEN Unipetrol RPA.
- ORLEN Unipetrol Doprava – a professional railway carrier not only for chemical and petrochemical products, including related services.
- Paramo – the largest producer of asphalt, asphalt products and process oils, and which also operates a fuel terminal.
- Spolana – a member of the ORLEN Unipetrol Group since 2016, a producer of polyvinyl chloride, caprolactam, sulphuric acid and ammonium sulphate.

The following refinery and petrochemical products are the flagship products of the ORLEN Unipetrol Group:

- Refinery products: motor petrol, diesel fuel, light fuel oil, aviation fuel, LPG, asphalts, naphtha, lubricating and fuel oils.
- Petrochemical products: ethylene, propylene, C4 fraction, benzene, high density polyethylene, polypropylene, PVC, DCPD.
- Agrochemical products: ammonia, highly conductive carbon black, caprolactam, sulphuric acid, oleum and ammonium sulphate.

2. Important milestones of the ORLEN Unipetrol Group in 2022

The following events can be considered the most important events of 2022 for the ORLEN Unipetrol Group in terms of occupational health, safety & environmental protection:

- A new DCPD plant was constructed and commissioned.
- A decision on an integrated permit for ORLEN Unipetrol RPA's "Heat and Power Plant T600" was issued.
- The European Chemical Agency's decision to register ORLEN Unipetrol RPA's new MeDCPD product was issued.
- The planned demolition of selected buildings at the old SPOLANA s.r.o. heat and power plant has begun.
- SPOLANA s.r.o.'s new gas boilers (the 'New Energy Centre' or 'NEC') were put into full operation, while the operation of the original boilers ('old boiler facility', 'heating plant') was permanently discontinued.
- The production of final oils and greases was discontinued at Paramo, a.s. as part of the Synergy project.
- The fire brigade was disbanded in connection with the restructuring and discontinuation of production at the Kolín Profit Centre.
- Demolition work began at Paramo Pardubice involving the former propane deasphalting plant, changing room No 100 and the K3 boiler.

3. The role of employees

In the ORLEN Unipetrol Group companies, employees are considered to be key players in environmental protection, occupational health and safety and fire protection activities. The individual companies have therefore implemented an effective training system for all employees. Employee training and education are part of the management systems in place and are subject to regular review, evaluation and supplementation in the companies in accordance with the ISO 9001, 14001, 45001 and 50001 standards.

All employees are actively and constantly involved in the creation and application of occupational health, safety and environmental protection.

Proper training does not only apply to the companies' own employees, but also to employees of external companies operating at the production sites. Obligations related to occupational health, safety, environmental protection and fire protection are part of the contracts signed with individual contractors.

Employees are further trained through becoming familiar with policies, operating regulations, and organisational and management standards in environmental protection, health and safety, fire protection, the environmental aspects of their activities, and with the goals and programmes defined for their workplaces.

The active role of employees is also supported by the implemented IDEA platform, through which the Group's employees are motivated to submit their own suggestions to help meet and improve ORLEN Unipetrol Group goals, including in environmental protection and occupational health and safety.

4. Public communication

To communicate with the public, the ORLEN Unipetrol Group primarily uses the following:

- Compliance with corporate social responsibility (CSR) principles by the ORLEN Unipetrol Group companies towards cities and municipalities in the surrounding areas.
- Informing about the company's environmental impact in the surrounding areas through the participation of representatives of the ORLEN Unipetrol Group management in public meetings of the councils of neighbouring municipalities.
- Regular meetings with the mayors of the municipalities in the vicinity of the production plants, during which the participants are informed about all activities, including environmental protection and information on the occurrence of non-standard operating situations.
- Operating the Green Line of the Most and Kralupy nad Vltavou Ecological Centres and internal communication sources (print, intranet and email communication).
- Online connection of the Police of the Czech Republic and the City Police in Litvínov and Most to the company warning system at Chempark Záluží.
- Sending emergency text messages via the Most and Litvínov city information channel.
- Operation warning and alert signalling and sound systems at production sites and in the surroundings areas.
- Sharing information with the public through the Most and Kralupy nad Vltavou Ecological Centres.
- Cross-border cooperation with Saxony through a joint working group and through the Most Ecological Centre.
- Internet and social media: Facebook, Twitter, Instagram, LinkedIn and YouTube.
- Interactive and educational programmes for primary and secondary school students, such as A Journey to the Secrets of Oil.

5. Integrated management system policy and integrated management systems

The integrated management system policy is established around the basic values of the ORLEN Unipetrol Group and the PKN Orlen Group, namely **Responsibility - Development - People - Energy - Reliability**. In line with the strategic focus of the Group companies, the policy includes commitments in occupational health and safety, environmental protection, quality, energy management, ethical standards and property protection.

The integrated management system policy is published on the websites of the individual companies.

The management systems in place are an important factor in environmental protection, product quality, occupational safety and health protection, fire protection and major accident prevention. ORLEN Unipetrol Group companies have implemented and certified their quality management systems (QMS), environmental management systems (EMS) and health and safety management systems (HSMS) as a guarantee of their systematic approach towards customers and their needs, product and service quality, environmental protection and occupational health and safety. Most companies have implemented and certified their own energy management systems (EnMS), by which these companies declare their commitment to energy consumption optimisation while at the same time also meeting the legislative requirements of the Energy Management Act.

The aforementioned management systems are certified according to the ISO 9001, ISO 14001, ISO 45001 and ISO 50001 international standards.

In May and June 2022, a recertification audit of the QMS, EMS, HSMS and EnMS management systems was conducted by ORLEN Unipetrol, ORLEN Unipetrol RPA (incl. the ORLEN Benzina registered branch and Polymer Institute Brno), ORLEN Unipetrol Doprava and Petrotrans. The LRQA Czech Republic s.r.o. certification organization confirmed compliance with the system standards and issued a certificate for the next three-year period to all the above companies.

Paramo underwent a surveillance audit by LRQA Česká republika s.r.o. covering all three systems – EMS, HSMS and QMS (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018) - in May 2022.

The first QMS, EMS, HSMS and EnMS surveillance audits were conducted at SPOLANA s.r.o. in May 2022. The audits were conducted by the Lloyd's Register EMEA certification company (as a result of the implementation of a single certification company for the entire ORLEN Unipetrol capital group).

ORLEN Unipetrol RPA has a certified system of sustainability in the production of motor fuels with bio-based components (ISCC). The last audit, which verified compliance with the system requirements, was conducted in November 2022 by TÜV SÜD Czech, s.r.o. The company has also had a certified sustainability system for the production of monomers and plastics from sustainable raw materials (ISCC PLUS) since November 2021. The system was recertified in November 2022.

ORLEN Unipetrol Doprava has implemented the Safety and Quality Assessment System for Logistics Service Providers (SQAS). The system was successfully recertified in October 2021 (with validity to 2024).

ORLEN Unipetrol Group certified/verified management systems in 2022

Company	ISO 9001	ISO 14001	ISO 45001	ISO 50001	SQAS	RC	ISCC	ISCC PLUS
ORLEN Unipetrol	●	●	●	●		●		
ORLEN Unipetrol RPA (including its ORLEN Benzina registered branch)	●	●	●	●		●	●	●
ORLEN Unipetrol RPA – PIB registered branch	●			●				
ORLEN Unipetrol Doprava	●	●	●	●	●	●		
Paramo	●	●	●					
Spolana	●	●	●	●		●		

Certificates are published on the websites of the individual companies.

6. Responsible Business in Chemistry programme – Responsible Care

The Responsible Care (RC) programme is a voluntary, globally accepted initiative by the chemical industry aimed at supporting its sustainable development by increasing the safety of its operating facilities and product transport, and by improving the protection of human health and the environment. The RC programme is a long-term strategy coordinated by the International Council of Chemical Associations (ICCA) and the European Chemical Industry Council (CEFIC) in Europe. The RC programme's contribution to sustainable development was recognised at the World Summit in Johannesburg with the United Nations Environment Programme award.

The national version of the RC programme is the Responsible Business in Chemistry programme officially launched by the Minister of Industry and Trade and the President of the Association of the Chemical Industry of the Czech Republic (SCHP ČR) in October 1994. The programme has met the requirements of the Responsible Care Global Charter since 2008.

The ORLEN Unipetrol Group, which includes ORLEN Unipetrol a.s., ORLEN Unipetrol RPA s.r.o., ORLEN Benzina and ORLEN Unipetrol Doprava, successfully defended its right to use the Responsible Care programme logo in 2021. The three companies have the right to use the Responsible Care programme logo until 2025, when they will once again go through the public defence system.

Paramo is no longer a member of the Czech Chemical Industry Association and therefore does not use the authorisation, although it continues to comply with the principles.

Spolana defended its right to use the RC programme logo for the tenth time in 2022. It successfully defended its right to use the RC programme logo for another five years, i.e. until October 2027, in 2022.

7. Compliance with environmental protection laws

There were no violations of legal requirements at ORLEN Unipetrol RPA in 2022.

SPOLANA s.r.o. operated in accordance with air protection legislation, and the emission limit was exceeded only once in 2022. The circumstances under which the HCl emission limit was exceeded at the exhaust from the thermal waste treatment unit (TWT) were caused by malfunctioning fan at the degassing transport node at the time of measurement, repaired immediately after its detection. An administrative offence procedure was initiated in early 2023 and had not ended when this report was prepared (April 2023).

The operating conditions and emission limits set out in the integrated permits for all ORLEN Unipetrol RPA facilities were complied with in 2022.

All the activities of ORLEN Unipetrol Doprava, Paramo and Spolana, except for the TWT installation, were carried out in full compliance with environmental protection legislation in 2022.

8. Integrated pollution prevention and control

The obligations of selected industrial enterprises in integrated pollution prevention and control (IPPC) are regulated by Act No. 76/2002, as amended. All ORLEN Unipetrol RPA production units, including the refineries in Litvínov and Kralupy nad Vltavou, are subject to the IPPC Act and have valid integrated permits issued by the regional authorities of the Ústí nad Labem and Central Bohemian Regions. These permits are updated on an ongoing basis in response to the requirements of amended legislation and compliance with deadlines, the implementation of investment projects, changes in technological equipment and/or changes in the substances used. A total of 13 changes to integrated permits were issued for ORLEN Unipetrol RPA facilities in 2022. The changes included, but were not limited to, the following:

- The descriptions of the facilities or the wording of the conditions of the integrated permits were formally modified, and updated versions of the operating rules for air pollution sources and the operator's emergency plans were approved.
- Air protection and waste management related conditions were modified in accordance with applicable legislation.
- The conditions for the Kralupy refinery's integrated permit were modified - in connection with the projects planned for implementation during the refinery shutdown in the spring of 2022 - including repairs to the sulphur production unit, the replacement of burners at the furnaces and a new natural gas connection.
- IP changes were issued for the Litvínov Refinery in connection with the Petrol Purification Machine Optimisation, High H_2S Content Petrol Pumping, and HVO Storage and Pumping investment projects.
- The operation of the related technologies was additionally permitted following changes to the Heat and Power Plant T600 construction plan.
- An integrated permit was issued for "Heat and Power Plant T600".

Commission Implementing Decision (EU) 2022/2427 of 6 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector, was published in the Official Journal of the European Union on 12 December 2022. ORLEN Unipetrol RPA s.r.o. has initiated activities aimed at meeting the requirements resulting from these conclusions.

ORLEN Unipetrol RPA and SPOLANA were involved, through a technical working group established by the Ministry of Industry and Trade of the Czech Republic, in the preparation of a document on the best available techniques for large-volume inorganic chemicals.

Valid integrated permits have been issued for all technologies operated by Paramo. The Pardubice Profit Centre obtained a joint integrated permit for energy operations, asphalt operations, fuel operations and oil operations issued by the Regional Authority of the Pardubice Region. The IP was updated once (introduction of another fuel type for the boiler facility - boiler K1) in 2022. The Kolín Profit Centre obtained one integrated permit issued by the Regional Authority of the Central Bohemian Region.

In 2022, Paramo submitted an application for a change to the IP in connection with extending the wastewater discharge permit.

Spolana has obtained a total of four integrated permits for the operation of the facility. The Regional Authority issued four changes to the integrated permits (IPs) in 2022. The changes consisted of adjustments to the binding conditions related to soil monitoring and the rectification of conditions for exemption from emission limits associated with the best available techniques for the NOx indicator granted to the R-201 cracking furnace. Spolana applied for two more changes to the integrated permits in 2022. However, the process was not completed in that year.

9. Overview of valid integrated operating permits

Production unit	Integrated permit – (issued by)
ORLEN Unipetrol RPA	
Production of polypropylene and polyethylene	Regional Authority of the Ústí nad Labem Region
Ethylene Unit	Regional Authority of the Ústí nad Labem Region
Ammonia production	Regional Authority of the Ústí nad Labem Region
Production plant – Gasification of mazut	Regional Authority of the Ústí nad Labem Region
Energy Services Unit	Regional Authority of the Ústí nad Labem Region
Dicyclopentadiene production	Regional Authority of the Ústí nad Labem Region
Litvínov Refinery	Regional Authority of the Ústí nad Labem Region
Kralupy nad Vltavou Refinery	Regional Authority of the Central Bohemian Region
Heat and Power Plant T600	Regional Authority of the Ústí nad Labem Region
Paramo	
Refinery operation, Pardubice Profit Centre	Regional Authority of the Pardubice Region
Kolín Profit Centre	Regional Authority of the Central Bohemian Region
Spolana	
Energy and toxic waste landfill (TWL)	Regional Authority of the Central Bohemian Region
Chlorine and sodium hydroxide production using amalgam electrolysis	Regional Authority of the Central Bohemian Region
Polyvinyl chloride (PVC) production	Regional Authority of the Central Bohemian Region
Caprolactam and sulphuric acid production	Regional Authority of the Central Bohemian Region

10. Emissions into the environment

Pollutant emissions into the environment have stabilized over the last five years thanks to extensive environmental investments made in the previous decade. The individual emissions into various environment components are described in the following chapters.

10.1 Wastewater discharge

At ORLEN Unipetrol RPA, the quantity of discharged wastewater corresponds to the long-term average and is partly affected by precipitation. The concentration of pollutants in wastewater has been stable for a long time and their quantities are directly proportional to the quantity of wastewater discharged. In terms of the amount of water and the content of pollutants in it, the 2022 values did not deviate significantly from the values of recent years.

The Kralupy Refinery underwent an extensive renovation of the wastewater treatment plant from 2013 to 2015. The treatment plant completed a two-year trial operation in 2016 and 2017, and permanent operation began on 1 January 2018. In 2019, the validity of the existing limits for wastewater discharge was extended until 31 December 2023. The year 2022 was reassessed based on results from the ORLEN Unipetrol RPA s.r.o. accredited laboratory, and all limits and conditions for the operation of the WWTP were met.

The quantities of pollution discharged at Spolana have been stable, with the exception of mercury, the quantity of which has dropped significantly. The partial concentrations of contaminants has increased slightly due to the loss of a significant amount of water from the discontinued crude-ash hydrotransport. At the final point of treated wastewater discharge into the Elbe bearing the designation K10, the "p" limits of the following indicators were exceeded in 2022, however the permissible numbers of samples non-compliant with the "p" limit were not exceeded, and the "m" limits were not exceeded. The CODCr indicator, as a group determination of organic substances in water (3 exceedances out of 5 possible exceedances), the 1,2-dichloroethane indicator (1/5), and the dissolved inorganic salts indicator (3/5).

Paramo – the rate of transmitted wastewater pollution has not changed significantly over the years. The AOX indicators increased slightly at the Pardubice Profit Centre due to a change in the operating mode of the HMGWP system and the intensive production of oxidised asphalts combined with a lower ratio of dilution water due to lower atmospheric precipitation. Wastewater pollution at the Kolín Profit Centre (to the Hluboký potok stream) is steady.

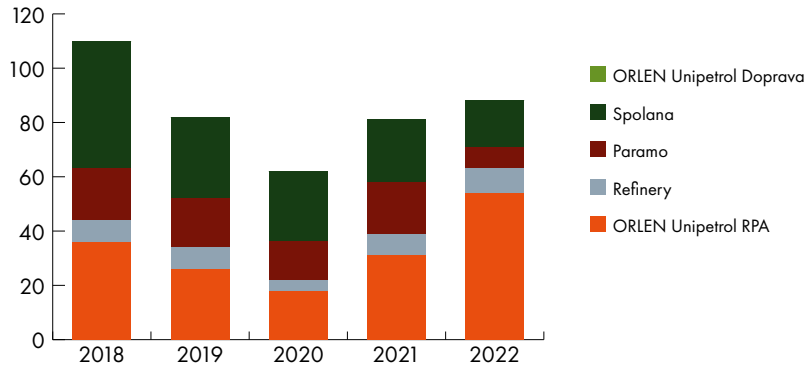
The wastewater pollution indicators for the ORLEN Benzina registered branch cannot be listed as the monitored parameters are inconsistent in the petrol station network and thus cannot be reported in the overview. In the overall evaluation of the individual petrol stations, the monitored parameters were not exceeded in terms of the "m" value.

The pollution contained in the ORLEN Unipetrol Doprava wastewater is directly proportional to the number of treated facilities containing harmful substances.

Pollution discharged into wastewater in the Group (t/year)[1)]

Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	BOD_5	36	26	18	31	54
Refinery[2)]	BOD_5	8	8	4	8	9
Paramo	BOD_5	19	18	14	19	8
Spolana	BOD_5	47	30	26	23	17
ORLEN Unipetrol Doprava	BOD_5	0	0	0	0	0
ORLEN Unipetrol Group	BOD_5	**110**	**82**	**62**	**81**	**88**

[1)] ORLEN Benzina is not monitored globally. No representative data can be assessed.
[2)] Only the Kralupy site; there is no direct discharge in Litvínov.



Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	COD_{Cr}	321	293	305	301	334
Refinery[2)]	COD_{Cr}	32	29	31	52	48
Paramo	COD_{Cr}	62	61	57	65	34
Spolana	COD_{Cr}	412	370	352	321	296
ORLEN Unipetrol Doprava	COD_{Cr}	39	36	26	25	21
ORLEN Unipetrol Group	COD_{Cr}	**866**	**789**	**771**	**764**	**733**

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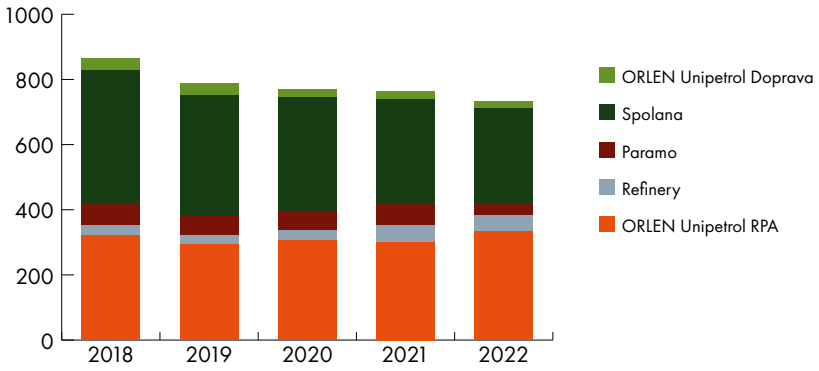
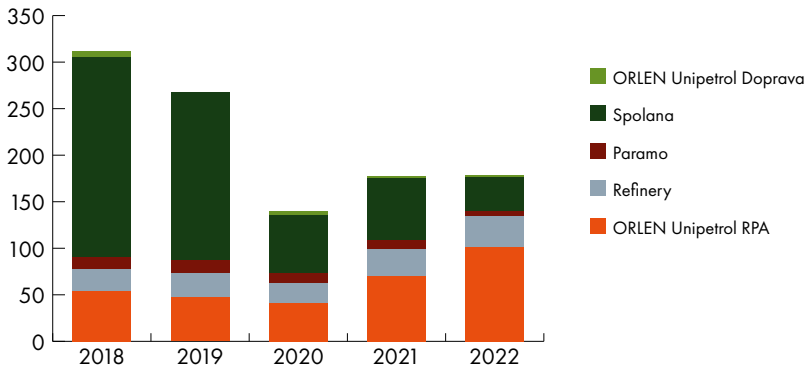


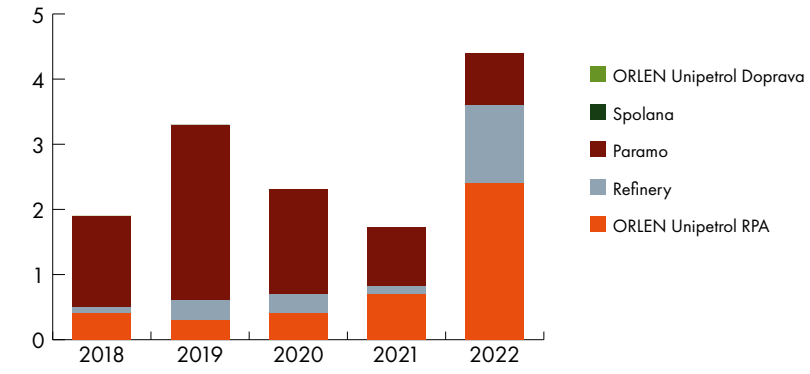
Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	SS	54	47	41	70	101
Refinery[2)]	SS	23	26	21	29	33
Paramo	SS	13	14	11	10	6
Spolana	SS	215	176	63	66	36
ORLEN Unipetrol Doprava	SS	7	5	4	3	3
ORLEN Unipetrol Group	SS	**312**	**268**	**140**	**178**	**179**

[1)] ORLEN Benzina is not monitored globally. No representative data can be assessed.
[2)] Only the Kralupy site; there is no direct discharge in Litvínov.



Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	oil products	0.4	0.3	0.4	0.7	2.4
Refinery[2)]	oil products	0.1	0.3	0.3	0.1	1.2
Paramo	oil products	1.4	2.7	1.6	0.9	0.8
Spolana	oil products	-	-	-	-	-
ORLEN Unipetrol Doprava	oil products	0	0	0	0	0
ORLEN Unipetrol Group	oil products	**1.9**	**3.3**	**2.3**	**1.7**	**4.4**

[1)] ORLEN Benzina is not monitored globally. No representative data can be assessed.
[2)] Only the Kralupy site; there is no direct discharge in Litvínov.



10.2 Waste Management

The amount of waste generated at ORLEN Unipetrol RPA in 2022, including the Litvínov Refinery, was lower than in previous years. At the Kralupy Refinery, there was a slight increase in waste generation compared to the previous year as a result of a shutdown of the Kralupy Refinery technology.

At Paramo, there was a slight decrease in waste generation due to the activities of contractors involved in the shutdown of production units at the Kolín Profit Centre who became waste generators. The standard amount of waste was generated at the Pardubice Profit Centre.

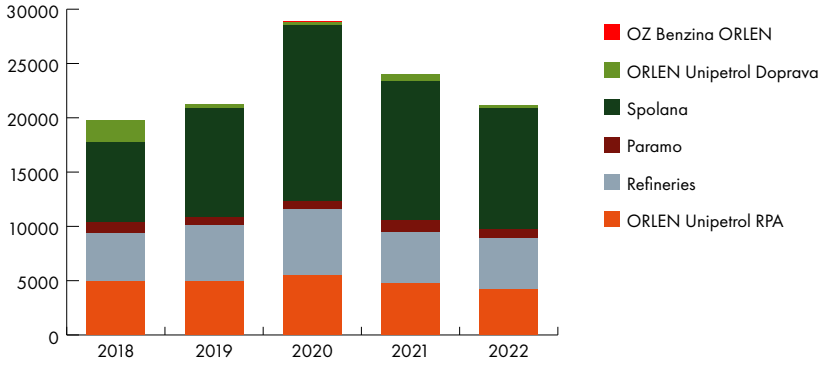
The decrease in the generation of hazardous waste by ORLEN Unipetrol Doprava is related to reduced capacity utilization at the steaming station in Litvínov. The reduction in the generation of other waste was associated with waste prevention, and no decommissioned railway vehicles were disposed of.

The increase in the generation of hazardous waste at Spolana over the last several years is related to the decommissioning, remediation and gradual dismantling of selected technological units at the former amalgam electrolysis facility, while the increase in the generation of other waste is related to the disposal of metal waste.

Not all waste generated through the operation of petrol stations - only waste from investment and other contracts - is reported for the ORLEN Benzina registered branch. The petrol station lessee, as an independent business entity, is the originator of the remaining waste generation.

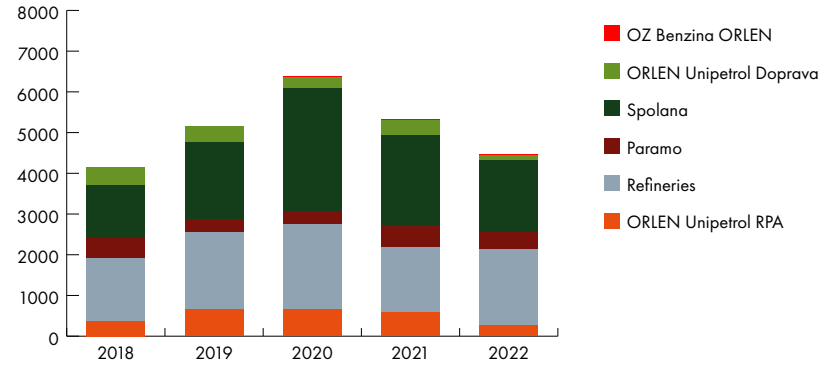
Waste generation in the Group (t/year) – total

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	4 932	4 896	5 439	4 786	4 207
Refineries	4 409	5 180	6 092	4 671	4 712
Paramo	1 072	788	796	1 087	829
Spolana	7 364	9 997	16 152	12 854	11 147
ORLEN Unipetrol Doprava	1 985	387	362	564	213
RB ORLEN Benzina	28	16	18	35	40
ORLEN Unipetrol Group	**19 790**	**21 264**	**28 859**	**23 997**	**21 145**



Waste generation in the Group (t/year) – hazardous waste only

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	369	651	651	584	269
Refineries	1 546	1 915	2 109	1 608	1 871
Paramo	494	297	316	533	412
Spolana	1 285	1 907	3 020	2 205	1 763
ORLEN Unipetrol Doprava	443	372	269	375	129
RB ORLEN Benzina	7	10	2	30	25
ORLEN Unipetrol Group	**4 144**	**5 152**	**6 367**	**5 335**	**4 469**



10.3 Air protection

Total refinery emissions in 2022 were similar, in terms of most parameters, to those in previous years. The increase in total emissions for the SO_2 parameter was due to reduced catalyst efficiency before its replacement at the Sulfreen unit at the Litvínov Refinery and due to the composition of the raw materials processed at the Kralupy Refinery, yet the emissions are still lower than before the application of the DeSOx additive at the fluid cracking unit at the Kralupy Refinery in October 2018.

In 2022, ORLEN Unipetrol RPA recorded a significant SO_2 reduction due to the maximum utilisation of sulphur oxide reduction technology at the Heat and Power Plant T700. The ethylene unit reported an increase in NOx emissions due to increased operation of the K4 and K5 boilers. Airborne particulate matter (PM) was reduced due to the year-round operation of the K4 and K5 boilers.

At Paramo, natural gas was combusted in the boiler facilities of the Pardubice and Kolín Profit Centres and heating oil (TOT-R2M) in the Pardubice Profit Centre in 11-12/2022. The overall decrease in air pollution was due to the discontinuation or very significant reduction of the operation of combustion sources of air pollution in the decommissioned premises of the Kolín Profit Centre in 2022.

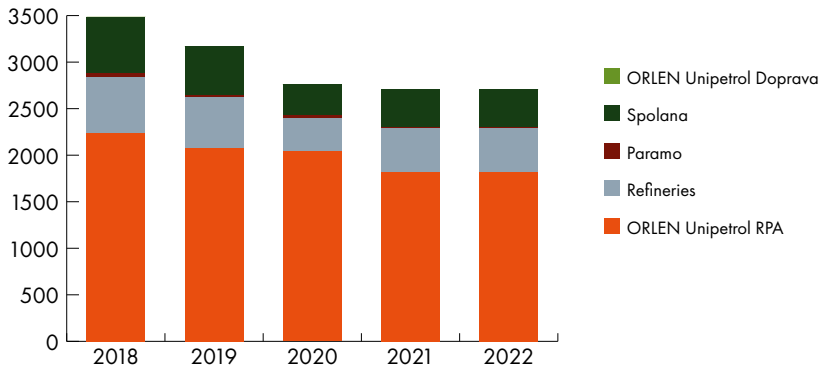
At Spolana, the decommissioning of coal-fired boilers as of 12/2019 resulted in significantly reduced emissions of $SO_2$and solids as well as NOx emissions from the company's energy operations. The higher emissions of solids in 2021 were caused by the penetration of substances through the terminal equipment.

At ORLEN Unipetrol Doprava, VOC quantities from the tank truck and rail tank cleaning and steaming station were lower in 2022 than in previous years due to the lower number of tanks where materials capable of emitting VOCs were cleaned.

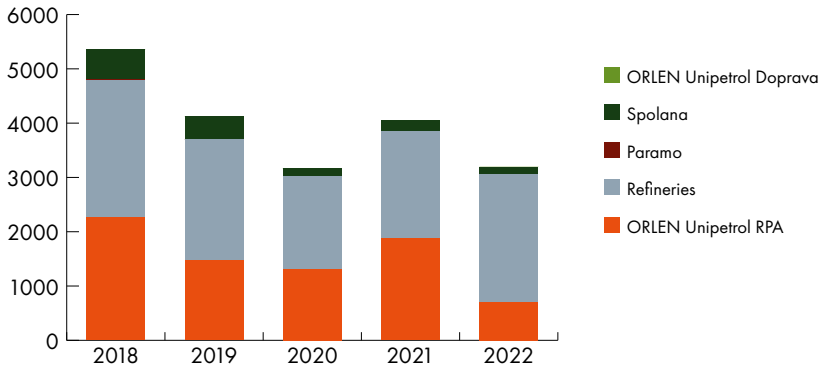
ORLEN Benzina continued to introduce new pumps equipped with an automatic Stage II petrol vapour recovery control system (VRSM).

Air pollution in the Group (t/year)

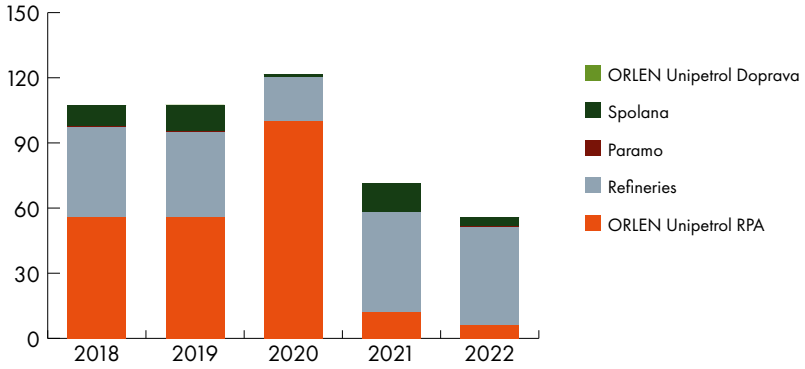
Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	NO_x	2 237	2 077	2 039	1 820	1 917
Refineries	NO_x	599	540	365	465	502
Paramo	NO_x	42	28	24	20	19
Spolana	NO_x	609	523	335	404	360
ORLEN Unipetrol Doprava	NO_x	0	0	0	0	0
ORLEN Unipetrol Group	NO_x	**3 487**	**3 168**	**2 763**	**2 709**	**2 798**



Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	SO_2	2 261	1 470	1 317	1 876	702
Refineries	SO_2	2 534	2 236	1 707	1 974	2 347
Paramo	SO_2	0.37	0.03	1.1	0.9	0.35
Spolana	SO_2	557	416	148	198	146
ORLEN Unipetrol Doprava	SO_2	0	0	0	0	0
ORLEN Unipetrol Group	SO_2	**5 352**	**4 122**	**3 073**	**4 020.9**	**3 195.35**

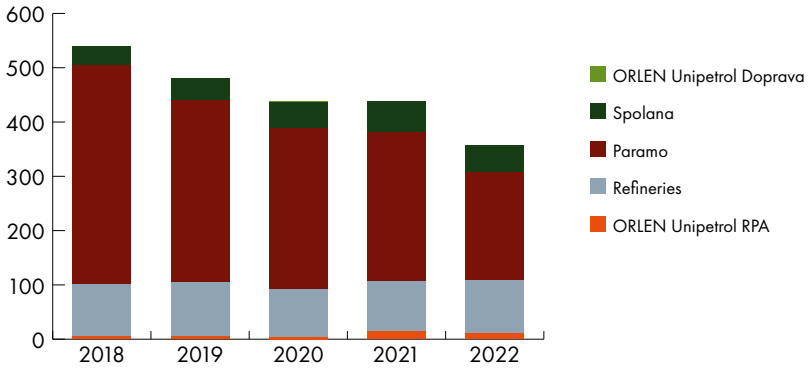


Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	Solid compounds	56	56	100	12	6
Refineries	Solid compounds	41	39	20	46	45
Paramo	Solid compounds	0.5	0.5	0.4	0.3	0.7
Spolana	Solid compounds	9.8	12	1	13	4
ORLEN Unipetrol Doprava	Solid compounds		0	0	0	0
ORLEN Unipetrol Group	Solid compounds	**107.3**	**107.5**	**121.4**	**72.3**	**55.7**



Company	Indicator	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	VOC	5	5	4	14	11
Refineries	VOC	97	101	87	93	97
Paramo	VOC[1)]	402	335	297	274	199
Spolana	VOC[1)]	35.3	39	49	57	50
ORLEN Unipetrol Doprava	VOC	0.9	1.1	1	0.8	0.7
ORLEN Unipetrol Group	VOC	**540**	**481**	**438**	**439**	**356.7**

[1)] 90% are fugitive emissions reported only based on solvent purchases in the relevant calendar year.



10.4 CO_2 emissions and allowance trading

The regulation of carbon dioxide emissions according to the EU Emissions Trading System (EU ETS).

The fourth trading period (2021-2030) is divided into two phases. For the first phase (2021-2025), the initial allocation of free allowances was carried out based on decisions taken by the Ministry of the Environment that may be revised from time to time based on actual production levels according to the Allocation Level Adjustment Statements. Allocation for the second phase (2026-2030) will take place in 2025.

Initial allocation of free allowances to ORLEN Unipetrol Group companies for the 2021–2025 period, actual CO_2 emissions 2021–2025

Initial allocation of free allowances (thousand units) real emissions (kt/year)	ORLEN Unipetrol RPA Petrochemicals and Agrochemicals	ORLEN Unipetrol RPA Litvínov Refinery and Kralupy Refinery[1)]	Paramo	Spolana	ORLEN Unipetrol Group
Total allocation for the 2021–2025 period	**4 581**[1)]	**3 449**	**158**	**272**	**8 460**
2021: real CO_2 emissions	3 326	917	40	82	4 365
2022: real CO_2 emissions	3 277	875	27	71	4 250

[1)] ORLEN Unipetrol RPA and Česká rafinérská merged in 2017. The refineries operated as a registered branch of the Refinery until 31 December 2018.

The emissions calculation for 2022 shows that the allocated annual allowance amount at ORLEN Unipetrol RPA, including the refinery units, covers approximately 40% of annual emissions. The deficit of allowances for 2022 is addressed via PKN Orlen, which handles all emission allowance trading within the PKN Group. Applications for the free allocation of allowances for the fourth EU ETS trading period were independently verified and submitted to the ministry in 2019. Free allowances were allocated after the values of the relevant benchmarks and correction factors were updated during 2021, and their amount was further adjusted according to the results of the facility operation levels verification report for 2019-2022. Audits of operating data were carried out for 2020-2022 for the purpose of submitting an application for indirect cost compensation due to the pass-through of emissions costs into electricity prices.

Compared to previous years, Paramo saw a slight decrease in CO_2 emissions production in 2022 due to the discontinued operation of the Kolín Profit Centre's production units, which were a source of CO_2 emissions.

At Spolana, CO_2 emissions dropped compared to 2020 due to the discontinued operation of coal-fired boilers.

10.5 Other greenhouse gases

All Group companies operate their production facilities in accordance with ozone layer protection requirements and in accordance with applicable international agreements. Refrigerants have already been replaced by more environmentally friendly media in previous years.

11. Management of primary sources of raw materials and energy

To conserve primary raw material and energy sources, the ORLEN Unipetrol Group follows sustainable development principles and focuses its basic strategy on innovative methods leading to the optimisation of energy and material inputs while promoting continuous improvement of environmental performance and increased energy efficiency. The Group companies, whose energy management systems have been successfully certified in accordance with ISO 50001, have committed to complying with these principles as part of the Integrated Management System Policy.

ORLEN Unipetrol RPA has prepared a strategy for reducing greenhouse gas emissions as part of the Decarbonisation programme. As part of the ORLEN corporate group, ORLEN Unipetrol has committed to achieving the carbon neutrality goals by 2050. The continuous reduction of energy losses through the Increased Reliability and Efficiency of Vapour Condensate Systems programme is an important step. As part of this programme, steam leaks at all production sites are continuously monitored and their elimination promptly initiated. Energy leakage monitoring includes replacing non-functioning condensate drainers, repairing steam leaks and replacing damaged or adding missing insulation. Leaks through piping valves are also monitored as part of the programme. The Group has been placing increasingly more emphasis on introducing energy-efficient and innovative solutions to optimise energy utilisation. The vast majority of these activities are carried out in the form of investment projects. At the same time, the area of digitalisation is taking off and will also contribute to optimising energy utilisation.

The New Boiler Facility in the Ethylene Unit project was completed and the facility was commissioned in 2021. The new boiler facility enables stable operation of the Ethylene Unit in compliance with legislation. In 2021, the second implementation phase of the Combustion One combustion control using new pyrolysis furnaces was also completed, and it was decided that the third phase will continue on the remaining furnaces, i.e. BA-101 through BA-105. This is now under way. Furthermore, the installation of Combustion One on the CCR unit furnace was completed in 2022 and, after successful commissioning, other furnaces in the Litvínov and Kralupy refineries will be considered.

In 2022, the New Energy Source project continued at Chempark Záluží, including a new steam-gas-fired heat and power plant, i.e. a shift away from coal which, combined with the latest technologies, will significantly reduce emissions and their release into the air (including CO_2 emissions). As part of this project, a study was carried out to select and define the most appropriate solution from both the technical and economic perspectives. The next stage will include the implementation of the selected solution.

The area of advanced process control (APC) methods is still being developed. An APC system is being installed at Heat and Power Plant T700, and will significantly contribute to the optimisation of operations and savings of primary raw materials, including but not limited to lignite. The APC system at the T700 will focus on the combustion process and its optimisation.

The Visual MESA tool is important for optimal energy consumption and utilisation. This system will enable the optimal use of all energy sources across the entire Chempark Záluží site, starting with energy generation at the T700 and its consumption at all production units, i.e. the refinery, petrochemical and agrochemical units. The Visual MESA tool is used to optimise energy utilisation on a daily basis. The fact that the created model evaluates all technologies in operation as a whole and seeks to optimise the entire site continues to be a significant benefit. It also enables the identification of more ideas for optimisation.

Within the units, great emphasis is placed on optimal capacity utilisation with a positive contribution to the energy efficiency of production. Projects aimed at increasing the reliability of the facilities continue in this area.

In terms of innovative projects, the preparation of projects for the use of low-energy/waste heat continues. The project called The Use of Flue Gas Heat in the Kralupy Refinery continues. The design documentation preparation (BDEP phase) for this project was completed in 2022, and the connection points implemented during a refinery shutdown. Another project is The Use of Medium-Pressure Steam at the Ethylene Unit, which aims at reducing energy losses during steam reduction by injection reduction. The replacement of conventional reduction valves with rotary ones is being considered as part of Energy Efficiency. Another activity is the investigation of the possibility of installing an ORC (Organic Rankine Cycle) to generate electricity from waste heat. If the results are positive, these projects will further advance to the implementation phase, where ORLEN Unipetrol Group will be involved in pilot installations and subsequent installations of full-fledged solutions.

An important part of energy efficiency is the installation of new and efficient devices that have the potential to save electricity.

The ORLEN Benzina registered branch focuses primarily on water, electricity and gas consumption at petrol stations. Energy consumption has been regularly monitored since 2017. IoT meters have been gradually installed to monitor the consumption of individual media (electricity, water, gas) at selected petrol stations (Energy Management System) since 2018. The idea behind the project is to obtain accurate data on the consumption of individual media and to use these data for the regular evaluation of energy consumption at petrol stations through online monitoring. Data obtained in this manner will be used to compare and evaluate opportunities for reducing consumption. The installation of IoT meters to monitor energy consumption at petrol stations continued in 2022. Energy management efforts include a task manager for evaluating and monitoring deviations in energy consumption, successfully launched on a pilot basis. Electricity use at petrol stations is also optimised through the implementation of low-energy appliances and technologies (LEDs). The implementation of PV systems at petrol stations (the company's own pilot project in cooperation with ORLEN Unipetrol RPA representatives) began in 2022.

An authorised Facility Management employee carries out regular monitoring of energy consumption (electricity, water, heat and gas) at the Polymer Institute Brno registered branch. Secondary meters (mainly water meters) are being installed to make the monitoring of individual consumption more accurate and to detect, address and verify any differences better and faster. In addition, electricity consumption is gradually being reduced by replacing old lighting with new low-energy lighting (LED), by purchasing new, more efficient equipment and through reduced production. This has resulted in electricity savings of 43.8 MWh compared to 2021. Water consumption increased in 2022 due to a defect in the industrial cooler and its subsequent repair, necessitating the use of water from the water main. Heat consumption dropped by 884 GJ in 2022 compared to 2019, reflecting the savings

resulting from the preceding modification of the heating system and heat recuperation in the hall. The largest savings were achieved in natural gas, where consumption was 2 687 m^3 lower than in 2021 thanks to the removal of some heaters and the optimisation of the entire heating system setup.

In terms of energy performance improvement, Paramo has long been implementing projects that contribute to reducing steam consumption for heating products and pumping lines (using heat from its own steam produced at the asphalt incinerator). The lengths of the steam pipeline routes have been optimised (reducing pipeline heat losses) and thermal insulation has been installed on selected tanks. Great attention is also paid to insulation through the Zero Tolerance for Steam Leaks and Missing or Damaged Insulation project. New feed pumps have been installed at Paramo to reduce electricity consumption. The renovation of the HV and LV substations to improve the reliability and safety of electricity distribution at the company was initiated and completed.

Spolana has implemented and successfully defended the EnMS system, a group of ISO 50 000 standards. To reduce the energy intensity of thermal energy generation, a project for the direct injection of EDC into the cracking furnace was implemented after the installation of a moisture analyser. A new gas boiler facility with a total nominal output of approximately 70 tonnes of medium pressure steam per hour was successfully approved. A major upgrade to sulphuric acid production, increasing energy and material efficiency and economy, is a strategic goal in the company's energy management, with the aim being to complete the work in 2026. Significant water-saving projects have been initiated, using waste heat to power and stabilise other production processes, as well as a project to optimise the use of air in the oxychlorination process with a significant reduction in specific power consumption in the production of vinyl chloride monomer. The preparation of the key initiation documentation for the PVC Upgrade project aiming to bring significant savings in heat generated from natural gas and electricity has begun. The preparation and collection of supporting documents for a major upgrade of the wastewater treatment plant with significant impact on optimising energy consumption as well as on utilising the potential of waste heat from the treated water for heat recovery using a heat pump was launched at the same time. At the Kaprolaktam plant, insulation on the steam and condensate pipelines was partially revitalized as part of the insulation restoration programme. All accessible condensate drains were diagnosed, and defective pieces subsequently repaired/replaced, as standard practice. A service test of the pumping of sulphur from railway tankers using condensate drainers is being carried out at the sulphuric acid plant. The findings will be applied in a feasibility study with implementation in the next period.

In energy management, ORLEN Unipetrol Doprava focuses mainly on optimising the consumption of fuel, electricity and process and heating steam.

The company has continued to upgrade its locomotive fleet, and as of 31 December 2022 there were a total of six Siemens Vectron MS multi-system locomotives in its fleet. The restoration of the locomotive fleet has resulted in fuel and electricity savings. Vectron multi-system locomotives also help reduce emissions. The locomotives are equipped with electricity meters that also enable energy recovery measurement. In 2022, 1 471 MWh of electricity was returned to the distribution system by the locomotives.

Furthermore, technological equipment is continuously modified and technological procedures continuously updated. Sidings have been technically modified since 2016. For example, photocells have been installed on the lighting towers along the siding track. Heating controls for building No 6419 have been installed. The first stage of the installation of energy-saving lighting fixtures at the siding in the ORLEN Unipetrol RPA complex in Litvínov took place in 2019, with the switch heating system being replaced, heating controls installed, and thermal insulation installed on buildings. The steaming time during vehicle cleaning has been reduced.

Water consumption in the Group (million m^3/year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	18.2	18.5	16.1	17.8	18.9
Kralupy Refinery	2	2.2	1.9	2.1	2.1
Paramo	0.4	0.4	0.3	0.3	0.2
Spolana	16.2	15.9	12.1	12.2	11.4
ORLEN Unipetrol Group	**36.8**	**36.8**	**30.4**	**32.4**	**32.6**

A positive trend is seen mainly in specific energy consumption thanks to the utilisation of production capacities. This always has a positive impact on energy and raw material use, and so it is more appropriate to monitor the ratio of energy consumption in tonnes of oil equivalent (TOE) to tonnes of production per year:

Energy consumption in the Group (thous. TJ/year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	9.1	9	8.6	9.9	9.2
Litvínov Refinery	9.9	10.2	8.1	9.3	9.8
Kralupy Refinery	7.5	7.9	7.1	8.7	7.7
Paramo	0.892	0.868	0.83	0.903	0.583
Spolana	2.7	2.6	2.0	2.0	1.8
ORLEN Unipetrol Group	**30.1**	**30.6**	**26.63**	**30.80**	**29.08**

Specific energy consumption in the Group (TOE/t of production per year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	0.143	0.151	0.158	0.145	0.140
Litvínov Refinery	0.045	0.047	0.050	0.048	0.046
Kralupy Refinery	0.057	0.053	0.059	0.063	0.059
Paramo Pardubice Profit Centre	0.123	0.134	0.148	0.154	0.131
Paramo Kolín Profit Centre	0.317	0.281	0.304	0.331	0.376
Spolana	0.117	0.126	0.119	0.109	0.113

12. Environmental investments

Environmental investments are defined as investment projects directly triggered by the requirements arising from environmental protection legislation, which are closely related to the application of integrated pollution prevention and control in practice or have a significant positive effect on the environment.

The following environmental investments were made in the Group in 2022.

Refinery

Environmental protection investment projects amounting to CZK 1 million were implemented in the refinery units. The most important ones included:

- construction of an emergency overflow and a sulphur tray at PS 2517 at the Kralupy Refinery

ORLEN Unipetrol RPA

Environmental protection investment projects amounting to CZK 385 million were implemented at ORLEN Unipetrol RPA. The most important ones included:

- completion of the construction of a new boiler facility at the ethylene unit
- completion of the project focusing on filtration of coke from the flue gas of the ethylene unit's pyrolysis furnaces
- completion of the installation of the Zickert system on the WWTP's settlement tank I

A number of other measures with a positive environmental impact were implemented and funded as part of equipment maintenance operating costs.

Paramo

Environmental protection investment projects amounting to CZK 9.1 million were implemented at Paramo. The most important ones included:

- demolition of the K3 boiler (as part of the K2 boiler restoration)
- restoration of fuel tank level measuring
- restoration of field instrumentation / replacement of steam pumps at SP
- insulation of storage tanks at SP and SR plants

Spolana

Environmental protection investment projects amounting to CZK 115 million were implemented at Spolana. The most important ones included:

- optimisation of air utilisation for oxychlorination
- restoration of sewers, renovation and addition of wastewater treatment technology, restoration of wastewater quality measurement
- a new filling point for sulphuric acid dispatch - ongoing
- renovation of cooling systems
- replacement of water pollutant tanks

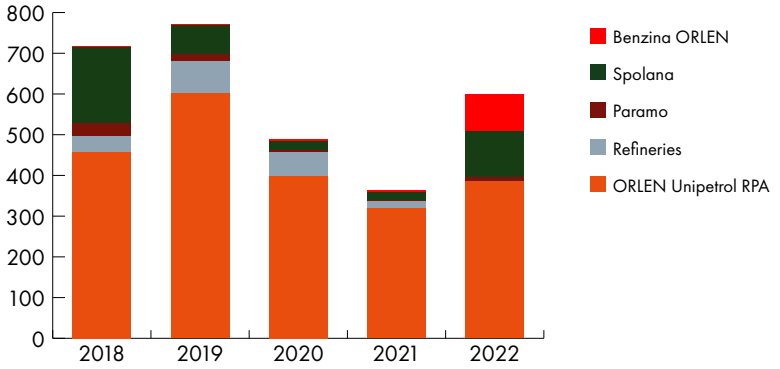
ORLEN Benzina

The ORLEN Benzina registered branch implemented environmental protection investment projects amounting to CZK 89.3 million. The investment projects focused primarily on:

- renovation of the petrol station sewers
- installation of new vehicle washing facilities
- replacement of emergency collectors, fuel tanks and distribution systems
- modification of the drainage in water-proofed areas

Environmental protection investment costs in the Group (CZK mil./year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	458	601	398	319	385
Refineries	38	81	60	18	1
Paramo	33.5	15.4	2.7	0.8	9.1
Spolana	186.4	70.5	22.2	21	115
ORLEN Benzina	2	2.5	6.7	5.1	89.3
ORLEN Unipetrol Group	**718**	**770**	**490**	**364**	**599.4**



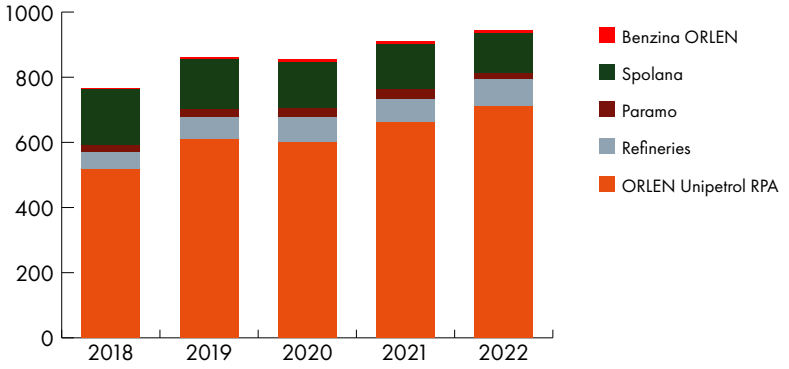
13. Environmental operating costs

Costs associated with the operation of facilities for air protection, wastewater treatment, waste management, operation of environmental management systems, monitoring of substances discharged into the environment, environmental impact assessment (EIA), integrated pollution prevention and control and other related environmental activities are referred to as environmental operating costs.

Newly installed modern technologies with a high degree of raw material conversion, reduced waste volume and high energy efficiency have resulted in an overall reduction in environmental operating costs compared to the previous decade. Environmental protection operating costs have been more or less stable over the last decade.

Environmental protection operating costs in the Group (CZK mil./year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	516	608	601	661	710
Refineries	55	70	77	73	83
Paramo	19.8	22.4	25.8	28.7	19.6
Spolana	172.2	154	144	139	123
ORLEN Benzina	4	8	8	7	9
ORLEN Unipetrol Group	**767**	**862**	**855**	**909**	**944.6**

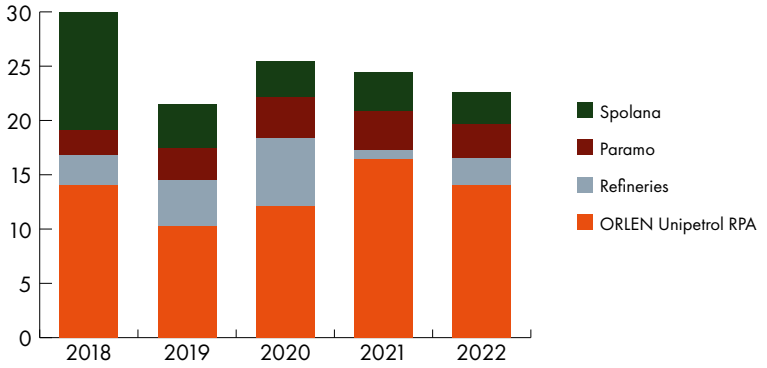


14. Total environmental protection costs

The total environmental protection costs at the ORLEN Unipetrol Group include environmental investment costs, environmental protection operating costs, environmental remediation costs and charges for air pollution, wastewater discharge, landfill disposal, generation of a landfill reclamation reserve and compensation for pollution damage to forests.

Environmental pollution fees and payments in the Group (CZK mil./year)

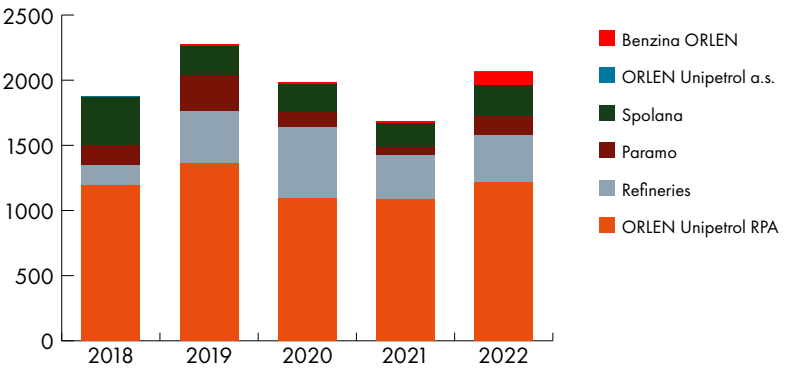
Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	14	10.3	12.1	16.4	14
Refineries	2.8	4.2	6.3	0.9	2.5
Paramo	2.3	2.9	3.7	3.6	3.2
Spolana	10.9	4.1	3.4	3.5	2.9
ORLEN Unipetrol Group	**30**	**22**	**26**	**24**	**22.6**



The total environmental protection costs incurred by the Group in 2022 amounted to approximately CZK 2 billion.

Total environmental protection costs in the Group (CZK mil./year)

Company	2018	2019	2020	2021	2022
ORLEN Unipetrol RPA	1 192	1 362	1 097	1 086	1 216
Refineries	158	400	541	336	362
Paramo	146.2	274.5	119.03	67.5	144.02
Spolana	369.5	229	211	178	241
ORLEN Benzina	9.9	11.6	16.2	16.7	99.5
ORLEN Unipetrol a.s.	1.3	1.3	1.6	1.6	2.46
ORLEN Unipetrol Group	**1 871**	**2 251**	**1 986**	**1 686**	**2 065**



15. Remediation of old environmental burdens

Based on a decision of the government of the Czech Republic in connection with the privatisation, the ORLEN Unipetrol Group companies have concluded the following agreements with the Ministry of Finance of the Czech Republic to address environmental liabilities that arose prior to privatisation (Environmental Agreement):

1) Environmental Agreement No 14/94, as amended by Amendment 4 of 6 May 2019, signed by Unipetrol
2) Environmental Agreement No 32/94, as amended by Amendment 2 of 6 May 2019, signed by Unipetrol
3) Environmental Agreement No 39/94, as amended by Amendment 4 of 28 January 2019, signed by Paramo
4) Environmental Agreement No 58/94, as amended by Amendment 5 of 28 January 2019, signed by Paramo
5) Environmental Agreement No 184/97, as amended by Amendment 9 of 18 June 2019, signed by the ORLEN Benzina registered branch
6) Environmental Agreement No 33/94 including Amendments 1-4, signed by Spolana

Remediation work, which is at various stages of progress, is performed under the environmental agreements. **An updated overview is provided in the following table:**

Litvínov

Location	Current status	Further steps
Růžodol lagoons	Landscaping and land reclamation is underway	Completion of landscaping with subsequent reclamation, continued monitoring, a project for the elimination of free-phase oil products and a project for the destruction of shafts in the R14 lagoon
Plant complex	Remediation was completed and dispersion plumes 1, 2c, 3, 6, 10 were handed over to the acquirer, post-remediation monitoring was carried out in dispersion plume 4, remediation was evaluated on dispersion plume 9, remediation work not completed on dispersion plumes 2, 5, 7, 11 and in block 32	Extension of the bridging periods for KM2a and 11 by one year, design documentation for the selection of a remediation contractor for KM2a, 11 and 7b, selection of a contractor for KM 2a, 11 and 7b, continuation of remediation or, where appropriate, post-remediation monitoring on other plumes
Uhlodehta landfill	Approval of the final report for the updated risk analysis	Design documentation for the selection of a remediation contractor
Landfill for solid industrial waste	A new CEI decision was issued in 2021	Monitoring continues, landfill reclamation project
Lime sludge dump II	A new CEI decision was issued in 2021	Monitoring continues, landfill remediation feasibility study
Lime sludge dump by the siding	A new CEI decision was issued in 2021	Monitoring continues, landfill remediation feasibility study
South foreland of ash dumps	Partial reclamation, a new CEI decision was issued in 2021	Monitoring continues, extension of the monitoring project, project for the operation of protective pumping and treatment of water from the Nová voda střed reservoir, including a flood test, a project for oil product sludge removal, a project for the removal of bottom sediments in the Nová voda sever reservoir, a project for covering unrehabilitated flue ash at Nová voda střed
Ash landfills	Partial reclamation, a new CEI decision was issued in 2021, a project for drilling works (expansion of the monitoring system)	Monitoring continues, a project for the removal of local surface sites with the presence of oil sludge, a project for landfill remediation, implementation of drilling works (extension of the monitoring system), extension of the monitoring project
Dispersion plume 13	Protective remediation pump and treat process at the acquirer's expense (ORLEN Unipetrol a.s.)	Remediation feasibility study
Pump and treat in the Nová voda střed reservoir	Protective remediation pump and treat process	Protective remediation pump and treat process and for further steps see 'South foreland of ash dumps'
Pumping and treatment of Růžodol dispersion plume 12	Protective remediation pump and treat process	Selection of a new contractor for the protective remediation pump and treat process, feasibility study for an optimal water management solution in the area

Kralupy nad Vltavou

Location	Current status	Further steps
Plant complex	Risk analysis updated (RAU)	Additional research, remediation project documentation
Nelahozeves landfill	Pollution remediation	Monitoring of groundwater and surface water, targeted risk analysis update, selection of a contractor for the temporary landfill closure
Plant complex – dispersion plume E	Selection of a remediation contractor	Pollution remediation
Oil sludge	Feasibility study – finalisation of verification and updating	Selection of the remediation contractor, pollution remediation

ORLEN Benzina (distribution storage sites and the most important petrol stations)

Location	Current status	Further steps
PS Ostrava-Muglinov	Remediation implementation project	Pollution remediation
DS Točník	Pollution remediation, protective remediation pump and treat process	Post-remediation monitoring
DS Liberec-Rochlice	Remediation concept, design documentation for the protective remediation pump and treat process	Protective remediation pump and treat process Remediation implementation project
DS Šumperk	Risk analysis update, protective remediation pump and treat process	Remediation design documentation
DS Bartošovice	Pollution remediation	Post-remediation monitoring
PS Pardubice Chrudimská	Protective remediation pump and treat process	Remediation design documentation
PS Přelouč	Post-remediation monitoring	Final report
DS Nový Bohumín	Pollution remediation	Post-remediation monitoring

Paramo Pardubice

Location	Current status	Further steps
Časy	Remediation implementation according to the remediation completion project	Remediation continues according to the remediation completion project
Hlavečník	Protective pumping of rainwater	Protective pumping of rainwater
Surroundings of the main plant – LIDL	Contract completed in May 2018	-
Surroundings of the main plant – U Trojice	Pump and treat in wells and drains, and monitoring	Pump and treat and monitoring continues (managed by Paramo)
Main plants – phase 1 A	Contract completed in October 2020	-
Nová Ves	Post-remediation monitoring	Post-remediation monitoring

Paramo Kolín

Location	Current status	Further steps
Plant complex and sludge lagoons	Implementation of remediation work according to variant D	Implementation of remediation work according to variant D continues

Spolana

Location	Current status	Further steps
Remediation of a toxic waste landfill	Remediation completed	Remediation completed
Remediation of facilities contaminated with dioxins	Remediation completed	Site maintenance – in progress
Remediation of an amalgam electrolysis facility	Remediation completed	Remediation completed
Groundwater remediation, petrochemicals and its surroundings	Targeted updating of risk analysis, new decision, contract with the remediation project contractor	Remediation project
Groundwater remediation, old plant	Feasibility study, targeted updating of risk analysis, new decision, contract with the remediation project contractor	Remediation project
Remediation of mercury contamination on the banks of the Elbe	Remediation completed, replacement planting	Remediation completed, aftercare of planted trees
New contamination hotspots	Tender documentation for the selection of the Risk Analysis contractor, contracts for work with Risk Analysis contractors	Risk analysis
Long-term water monitoring	Monitoring in progress	Water monitoring completed, contract for continued water monitoring

Overview of financial guarantees of the Ministry of Finance of the Czech Republic and drawing of funds at the ORLEN Unipetrol Group as at 31 December 2022 (CZK mil. incl. VAT)

	ORLEN Unipetrol Litvínov	ORLEN Unipetrol Kralupy	Paramo Kolín	Paramo Pardubice	ORLEN Benzina registered branch	Spolana	Group total
Financial guarantees from the MF CR	6 012	4 244	1 907	1 241	1 323	8 159	22 886
Costs covered by the MF CR in 2022	63.5	0.6	0.7	114.7	20.0	5.0	204.5
Costs covered by the MF CR since the start of work	4 456.1	65.8	1 902.9	1 108.1	806.1	5 665.2	204.5
Expected cost of future work	2 678.8	749.2	2.5	2 120.2	876.3	2 361.5	8 789
Total (estimated) cost of remediation	**7 135**	**815**	**1 905**	**3 228**	**1 683**	**8 027**	**22 793**

16. Chemical safety

All Group companies manufacture or use chemicals and mixtures in accordance with the applicable Chemical Act and Regulation (EC) No 1907/2006 (REACH). They classify their marketed chemical products in accordance with Regulation (EC) No 1272/2008 (CLP), and for those with hazardous properties, they process safety data sheets, which are then provided free of charge to all customers. At ORLEN Unipetrol RPA and Spolana, the safety data sheets of manufactured and purchased hazardous chemicals and mixtures are, in accordance with the REACH Regulation, available to all employees via the intranet – CASEC database (a system for the administration and accessibility of safety data sheets).

The Group companies continuously comply with the requirement of the REACH Regulation to keep the registration documentation up to date, and therefore they also have to make sure that their IUCLID software application, in which technical documentation for registered and notified substances is processed, complies with the latest version published on the ECHA website.

The Group constantly pays great attention to communication in the supply and demand chains in order to implement measures to protect employee health and the environment when hazardous chemicals are used directly or in mixtures. The Group monitors and incorporates any changes resulting from the clarification of processes associated with registering and classifying chemical substances and updates its safety data sheets accordingly.

All Group companies continuously monitor the handling of chemical substances and mixtures, from raw materials to finished products, and ensure compliance with applicable laws and regulations, including internal and external testing and the subsequent issuance of legal statements for the specific applications of selected products, for example when they are in contact with food, drinking water or used for medical purposes, etc. Customer services in the companies are in charge of providing detailed information about the characteristics of the products in relation to their specific use.

The Group companies are subject to international inspection by the UN focusing on compliance with commitments assumed under the Chemical Weapons Convention. All inspections carried out by government authorities and international inspection bodies in the Group companies to this day have shown compliance with the Convention commitments.

In October 2022, ORLEN Unipetrol RPA successfully completed the EU REACH registration process for the UVCB chemical Distillates (petroleum), steam-cracked, C10-11 cycloalkadiene fraction (MeDCPD concentrate). This is a new product the company intends to add to its portfolio. The company has also started to prepare for the registration of selected chemicals under local national REACH regulations in the UK and Turkey.

The registration documentation of all active substances at PARAMO a.s., including for which Paramo is the main registering entity on the EU market (Lubricating oils / EC 278-012-2), was updated in 2022. In 2020, the ECHA published an official request for additional testing of oxidised asphalts. All members of the joint submission will contribute financially to the testing. Paramo has been continuously monitoring the situation surrounding the restriction of "N-methyl 2-pyrrolidine" (Restriction as per Annex XVII, REACH), which is used as an extraction agent in the selective refining plant in the Pardubice Profit Centre.

In August 2014, Spolana submitted its first application for authorisation to use trichlorethylene in the production of caprolactam under Article 56 of Regulation (EC) No 1907/2006 REACH to the European Chemicals Agency (ECHA). The authorization was granted and was valid until 21 April 2020. In order to ensure the use of trichlorethylene after this date, an application for a review of the authorisation to use trichlorethylene (TCE) as an extraction solvent in the production of caprolactam was submitted to the European Chemicals Agency in accordance with REACH in August 2018. The first permit to use TCE was granted to Spolana (to April 2020), and in its review application Spolana requested an extension of the permit for another 12 years. In 2019, the ECHA made a recommendation to the European Commission to extend the Company's permit by the requested 12 years. On 4 March 2021, the European Commission issued an implementing decision authorising the use of trichlorethylene. The permit will expire on 21 April 2032 unless a review report is submitted in accordance with Article 61 (1) of the REACH Regulation by 21 October 2030.

In the spring of 2022, Spolana made a change to the fertiliser documentation in accordance with the new Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products.

17. Occupational health and safety, process safety and fire protection

Strategy

The ORLEN Unipetrol Group successfully implemented its strategy for occupational health and safety, process safety and transport of hazardous goods (hereinafter "safety") in 2022. The ORLEN Unipetrol Group took over this strategy from PKN Orlen and it is defined in the "New Directions for the Development of Personnel and Process Safety 2022-2026".

The strategy is directed towards areas such as leadership, personnel safety, hazard assessment and risk analysis, technical safety, fire prevention and transport of hazardous goods. These directions are divided into sub-activities in the ORLEN Unipetrol Group. The main objective of the safety strategy is to continuously improve safety processes. All activities within the new OHS directions are defined in such a way as to contribute to meeting the target values for the indicators of frequency of accidents and frequency of process safety events Tier 1.

Unification of rules and processes

The implementation of standards that contribute to the unification of safety rules continued throughout the ORLEN Unipetrol Group in 2022. Some of these standards were implemented through the Safety+ and Logistics+ projects. The successful implementation of the Safety+ project was verified through an audit conducted by PKN ORLEN in April 2022. The implementation of standards within the Logistics+ project was completed at ORLEN Unipetrol RPA in 2022 and continues at SPOLANA s.r.o. and PARAMO, a.s., according to the approved schedule.

Improving safety

A number of projects were implemented in the ORLEN Unipetrol Group to improve safety in 2022. Out of all the projects, we can name, for example, the implementation of a safety polygon within the Training Centre. Employees themselves also actively contribute to improving safety and are motivated to do so. Many projects implemented in 2022 were employee initiatives submitted as ideas for improvements through the IDEAplus platform.

The ORLEN Unipetrol Group recognises the importance of the role that the human factor plays in the prevention of undesirable incidents and how leadership and an established safety culture can influence the human factor, especially a proactive approach, communication and understanding of their role in safety. Employee training focuses on risk awareness and knowledge of how to manage such risks.

In September 2022, the ORLEN Unipetrol Group-wide "Safety Week" event was held, including lectures and demonstrations on first aid, safety when working at heights, demonstrations of personal protective equipment, a presentation of the company's fire brigade's combined vehicle and more.

In 2022, a safety information campaign was run at all ORLEN Unipetrol Group companies to highlight the importance of safety measures in the event of emergencies and compliance with safety rules at all ORLEN Unipetrol Group workplaces.

In the autumn of 2022, ORLEN Unipetrol RPA s.r.o. started to prepare the "Practical Safety Culture Training" programme for operations and maintenance employees at the Training Centre in Litvínov. This programme is aimed at improving the safety culture. The main topics include critical emergencies, multiskilling, safety valves, first aid, LOTO (Lock Out/Tag Out) and risk identification.

The system for selecting and evaluating contractors and subcontractors from the perspective of safety was also reviewed in 2022.

A Czech version of the regular monthly Process Safety Beacon was published on the intranet in 2022 as part of raising employee awareness of process safety. Furthermore, the 2021 Lessons Learned Almanac was distributed within the ORLEN Unipetrol Group.

Safety performance indicators

A unified system for monitoring selected safety performance indicators, including the monitoring of target values defined for 2022, is in place in the ORLEN Unipetrol Group. The target values of the indicators are set for the entire ORLEN Unipetrol Group. The main indicators monitored include the frequency of accidents, i.e. TRR (Total Recordable Rate) and the frequency of Process Safety Events Tier 1 (PSE Tier 1).

Overview of the number of Process Safety Events Tier 1 in the ORLEN Unipetrol Group 2019-2022

Company	2019	2020	2021	2022
ORLEN Unipetrol RPA	4	2	1	4
ORLEN Unipetrol Doprava	0	1	0	0
PARAMO	0	0	0	0
SPOLANA	3	1	2	1
Group total	**7**	**4**	**3**	**5**

Target safety indicators

ORLEN Unipetrol Group	Objective for 2022	Final value
TRR: Number of accidents resulting in absence per million hours worked	≤ 1.70	1.36
PSER – Tier 1: Number of process safety events per million hours worked	≤ 0.3	0.3

Safety was also included as an evaluation topic in the satisfaction survey conducted in the ORLEN Unipetrol Group in 2022. Safety ranked among the topics rated highest by employees.

PARAMO, a.s. successfully passed a surveillance audit of its integrated quality management system, assessing management system compliance with ISO 14001:2015 and ISO 45001:2018. A gradual update of the legislative documentation began due to the restructuring and discontinuation of production at the Kolín Profit Centre. Further implementation and incorporation of PKN ORLEN Safety standards took place in 2022. Planning for preparations for the electronic fire alarm system upgrade at the Pardubice Profit Centre and the relocation of the electronic fire alarm system control room at the Kolín Profit Centre.

18. Prevention, personal protective equipment

Implementation of and compliance with a risk prevention and management system is a fundamental commitment throughout the ORLEN Unipetrol Group.

The main safety-related priority of the ORLEN Unipetrol Group is prevention through actively identifying risk conditions during routine activities, planned inspections and audits, and implementing projects to improve occupational health and safety. The aim is to immediately eliminate risky conditions and thus prevent the occurrence of extraordinary adverse events.

Prevention as part of occupational health and safety is ensured by employees professionally qualified in risk assessment. However, during employee training, emphasis is placed on risk awareness so that both employees and contractors can assess the need to eliminate risks or minimise them as much as possible.

19. Personal protective equipment is distributed to employees based on risk identification and the assessment of risk to life and health. Quality of the work environment

The quality of the work environment at ORLEN Unipetrol Group companies is regularly monitored by measuring work environment factors including, but not limited to, noise levels and chemical and dust exposure limits, always based on the relevant work classification.

A gradual update of the legislative and internal documentation was begun at PARAMO, a.s. due to the restructuring and discontinuation of production at the Kolín Profit Centre. As part of the integrated controls in 2022, the regional hygiene station recommended the re-measuring of the noise levels at asphalt plants in the 2R category.

20. Healthcare and prevention

The ORLEN Unipetrol Group companies have concluded occupational medical services contracts with physicians. Preventive medical examinations are performed in accordance with applicable laws and regulations and internal guidelines.

21. Major accident prevention

Most ORLEN Unipetrol Group production companies are, due to being classified as Group B, subject to the strictest interpretation of Act No 224/2015, on prevention of major accidents when handling selected hazardous chemical substances / mixtures.

For years, the ORLEN Unipetrol Group companies have paid great attention to the prevention of major accidents. Accident prevention is based on the reliable and trouble-free operation of production equipment which is designed, operated, inspected and maintained in accordance with the legislation of the Czech Republic and the company's internal regulations. Some of the regulations also contain requirements beyond legislation and are based on the best practices of the Group companies.

Production sites are equipped with control systems signalling deviations from standard operating parameters. Some dangerous plants are equipped with systems that automatically shut down operating units in the event that the specified operating parameters are exceeded. Depending on the type of hazardous substances handled, the plants are equipped with modern detection systems (detection of flame, smoke or leaks of hazardous substances) with outputs to control rooms and operational centres of the relevant company's fire brigade. Stationary and semi-stationary fire extinguishers and fire monitors are installed at the production plants.

Regular internal audits focused on safety and accident risk prevention are carried out at the ORLEN Unipetrol Group companies. In addition, regular external audits and inspections are carried out by state expert supervision authorities. This includes, for example, the CEI, RLI, FD, RHS, Czech professional organisations, insurance brokers, insurers and foreign reinsurers. Recommendations and conclusions from these audits are included in the relevant implementation plans.

Regular employee training and education are important components of major accident prevention. The functionality of the major accident prevention system is checked throughout the year using emergency and crisis response exercises for on-site employees as well as in cooperation with internal and external intervention units, in the form of emergency drills at the individual production plants, as well as on-site emergency drills carried out in cooperation with companies managing industrial premises or doing business in their immediate vicinity. In the ORLEN Unipetrol Group companies, emergency drills are carried out according to plans. The drills are used for practical training of appropriate employee response to a possible accidents, to verify the valid emergency plans and procedures, and to improve the knowledge of everyone involved. If shortcomings are revealed during a drill, appropriate measures are taken during the evaluation of the drill to ensure such shortcomings are eliminated, including setting deadlines and nominating persons responsible for their implementation. The drill plan for 2022 was met. A total of 180 drills took place at the Litvínov facility, 40 of which were in cooperation with the Fire and Rescue Service. Twenty drills took place at the Kralupy facility (all in cooperation with the Fire and Rescue Service). Six drills of the company's fire brigade took place at PARAMO, a.s.

The management of major accident risks also includes liability insurance within the meaning of Act No 224/2015, on major accident prevention, as amended.

The safety level of the Group companies is significantly affected by new investments in production facilities. The potential risks of operating such facilities are already addressed in the project phase using generally accepted methods of assessing the risks of a major accident. New plants are always equipped with state-of-the-art safety systems and meet the requirements of the laws and regulations of the Czech Republic and the European Union.

The ORLEN Unipetrol Group production companies have their own fire brigades. Their equipment and training are first class, and this allows them to intervene in a highly specialised manner in the event of accidents involving the release of hazardous substances. The Kralupy Refinery unit uses the services of the SYNTHOS Kralupy, a. s. fire brigade. As part of the restructuring of PARAMO, a.s. and the discontinuation of production at the Kolín Profit Centre, the company fire brigade in Kolín was disbanded as of 31 July 2022.

Overview of the classification of businesses under Act No 224/2015, as amended

Company	Facility	Group	Safety report
ORLEN Unipetrol RPA	Litvínov facility	B	Approved by a decision of the Regional Authority of the Ústí nad Labem Region
	Kralupy facility	B	The updated Safety Report for Unipetrol RPA (Kralupy Refinery Unit) at the Kralupy Chemical Production Site was approved by a decision of the Regional Authority of the Central Bohemian Region on 15 February 2021
	ORLEN Benzina, registered branch	-	In accordance with Act No 224/2015, reports on non-inclusion of petrol stations were updated according to the law and submitted to the relevant regional authorities
ORLEN Unipetrol Doprava	Operations, Pardubice Plant, Semtín, Pardubice Railway Operations	B	Approved by a decision of the Regional Authority of the Pardubice Region
	Operations, Pardubice Plant, Semtín, Semtín siding	B	Approved by a decision of the Regional Authority of the Pardubice Region
	Operations, Pardubice Plant, Semtín, Kolín siding	-	In accordance with Act No 224/2015, a report on non-inclusion was submitted to the Regional Authority of the Central Bohemian Region
	Operations, Litvínov siding plant	B	Approved by a decision of the Regional Authority of the Ústí nad Labem Region
	Operations, Kralupy Plant, Neratovice, Kralupy Railway Operations	B	Approved by a decision of the Regional Authority of the Central Bohemian Region
	Operations, Kralupy Plant, Neratovice, Neratovice Railway Operations	B	Approved by a decision of the Regional Authority of the Central Bohemian Region
Paramo	Pardubice Profit Centre	B	The updated Safety Report was approved by the Regional Authority of the Pardubice Region on 8 September 2020
	Kolín Profit Centre	-	Not subject to Act No 224/2015
Spolana	Spolana	B	The updated Safety Report was approved by a decision of the Regional Authority of the Central Bohemian Region in 2019

22. Major accidents

In 2022, no major accident occurred at any facility of the ORLEN Unipetrol Group subject to Act No 224/2015, on major accident prevention.

Other operational accidents that occurred during the year were handled using our own resources, or using the companies' fire brigades. The response was adequate to remedy the issue and prevent recurrence. The effects of minor accidents did not extend beyond the territory of the ORLEN Unipetrol Group companies.

23. TRINS transport information and accident system

The TRINS transport information and accident system is an assistance system that defines a framework for collaboration in the following areas of cooperation:

- accidents involving the transport of hazardous substances,
- cooperation in the emergency response to accidents involving stationary installations,
- cooperation with member companies of the Czech Association of Cleaning Stations.

TRINS was established by the Association of the Chemical Industry of the Czech Republic as part of the Responsible Care programme in 1996 based on an agreement between the Association and the General Directorate of the Fire and Rescue Service of the Czech Republic, and included in the Integrated Rescue System of the Czech Republic as a support system. Foreign equivalents of TRINS include, for example, the British CHEMSAFE system and the German TUIS system, which served as a model for the development of TRINS. Similar systems have also been created in Slovakia (DINS), Hungary

(VERIK), and have been operating in a number of EU countries for many years. TRINS centres, in cooperation with the Fire and Rescue Service of the Czech Republic, provide the necessary urgent work-related consultations concerning data on chemical substances and products, their safe transport and storage, practical experience with handling dangerous substances and response to extraordinary events associated with their transport. TRINS centres also provide practical assistance in handling such emergencies and eliminating subsequent environmental damage.

There are currently 21 companies included in the TRINS system in the Czech Republic, while there are a total of 36 centres providing assistance at the individual levels within the TRINS system throughout the Czech Republic. The ORLEN Unipetrol Group companies are founding members of TRINS. In addition, ORLEN Unipetrol RPA serves as the system's national coordination centre.

The names of the ORLEN Unipetrol Group companies (ORLEN Unipetrol a.s., ORLEN Unipetrol RPA s.r.o., ORLEN Unipetrol RPA s.r.o. – ORLEN Benzina, registered branch, ORLEN Unipetrol RPA s.r.o. – POLYMER INSTITUTE BRNO, odštěpný závod, ORLEN Unipetrol DOPRAVA s.r.o., PARAMO, a.s., SPOLANA, s.r.o.) are also included in their simplified versions (ORLEN Unipetrol, ORLEN Unipetrol RPA, ORLEN Benzina / ORLEN Benzina registered branch, Polymer Institute Brno / PIB, ORLEN Unipetrol Doprava, Paramo, Spolana) in this report.

Abbreviations and acronyms:

ACHV – chemical production site

APC – Adaptive Process Control

BAT – Best Available Techniques

BWWTP – biological wastewater treatment plant

BOD_5 – biochemical oxygen demand

SR – safety report

CASEC – Chemical Abstract Substances Evidence Centre – a database of chemical substances and safety data sheets

CEFIC – The European Chemical Industry Council

CLP – Classification, Labelling and Packaging of substances and mixtures – regulation of the European Parliament

CO_2 – carbon dioxide

CONCAWE – CONservation of Clear Air and Water in Europe

CEI (OI) – Czech Environmental Inspectorate (district inspectorate)

WWTP – wastewater treatment plant

PS – petrol station

DCPD - dicyclopentadiene

$DeSO_x$ – technology for reducing sulphur oxide emissions

$DeNO_x$ – technology for reducing nitrogen oxide emissions

DS – distribution storage

EIA – Environmental Impact Assessment

ECHA – European Chemicals Agency

EU – ethylene unit

EnMS – Energy Management System

EMS – Environmental Management System

EU ETS – EU Emissions Trading System

FCC – Fluid catalytic cracking unit

FM – facility management

HMGWP – Hydrogeological Method of Ground Water Protection

HRGO – hydrogenation refining of gas oil

PC – profit centre

OHSMS – occupational health and safety management system

FRS – fire and rescue service

COD – chemical oxygen demand

ICCA – International Council of Chemical Associations

IP – integrated permit

IPPC – Integrated Pollution Prevention and Control

ISCC / ISCC PLUS – International Sustainability & Carbon Certification – an international certification system for sustainability and greenhouse gas emissions

RHS – regional hygiene station

LPG – liquefied petroleum gas

MESA – Management of Energy System Application

MEK – methyl ethyl ketone

MF CR – Ministry of Finance of the Czech Republic

SS – suspended solids

NO_x – nitrogen oxide

RLI – Regional Labour Inspectorate

RB – registered branch

QMS – quality management system

PVC – polyvinyl chloride

REACH – registration, evaluation and authorization of chemicals – EU regulation

RC – responsible care

SP – solvent paraffin

SCHP ČR – Association of the Chemical Industry of the Czech Republic

SO_2 – sulphur dioxide

SQAS – Safety and Quality Assessment System

TOE – tonne of oil equivalent

TRINS – transport information and accident system

VISUAL MESA – IT application (Management of Energy System Application)

VOC – volatile organic compound

ZERO – a software application for the central reporting of inspections and extraordinary events at ORLEN Unipetrol RPA

EP – environmental protection