Joint report 2020

on occupational health, safety
and environmental protection

ORLEN Unipetrol

Contents

1. Introducing the ORLEN Unipetrol Group

The Group is involved in refining and petrochemical operations and sale in the Czech Republic and Central Europe. The Group companies mainly produce and sell refinery products, chemical and petrochemical products, polymers, and specialty chemicals. The Group also operates its transport services and funds its research and development activities. ORLEN Unipetrol is a leading refining and petrochemical group in the Czech Republic and a major player in Central and Eastern Europe. The Group focuses on three strategic business segments:

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

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

- ORLEN Unipetrol RPA – a manufacturer and vendor of refinery, petrochemical and agrochemical products, the largest crude oil refining company in the Czech Republic for a wide range of products with a total annual capacity of 8.7 million tonnes. The registered branches of ORLEN Unipetrol RPA include the Benzina ORLEN petrol station network and the Polymer Institute Brno.
- ORLEN Unipetrol Doprava – a provider of professional railway transport for chemical, petrochemical and other products, and the related services.
- Paramo – the largest manufacturer of bitumen, lubricants, fuel oil and other refinery products.
- Spolana – a part of the ORLEN Unipetrol Group since 2016 and a manufacturer of polyvinylchloride, caprolactam, sulfuric acid, and ammonium sulphate.

The ORLEN Unipetrol Group mainly produces refinery and petrochemical products.

Refinery products: petrol, diesel, light heating oil, aviation fuel, LPG, asphalts, naphtha, lubrication, and heating oils.

Petrochemical products: ethylene, propylene, C4 fraction, benzene, high-density polyethylene, polypropylene, and PVC.

Agrochemical products: ammonia, highly conductive carbon black, caprolactam, sulfuric acid, oleum, and ammonium sulphate.

2. Important milestones of the ORLEN Unipetrol Group in 2020

The following can be considered the most important events of 2020 at the ORLEN Unipetrol Group in terms of protecting the environment and occupational health and safety:

- Launched preparations for building a new energy source (T600) in the Záluží site.
- Launched construction of the DCPD production site.
- Completed construction of the steam cracker's new energy source.
- Preparations for the project of building new polypropylene storage silos.
- Spolana continued the flood protection project, PPO Neratovicko.
- The overall turnaround of operations facilities was held in Chempark Záluží.
- Approval of PARAMO's safety report of 8 September 2020.

3. Role of employees

ORLEN Unipetrol Group employees play a crucial role in protecting the environment and activities associated with occupational health, safety, and fire prevention. The individual companies have therefore implemented an effective training system for all employees. The training and education of employees are part of the established management systems, which are subject to regular reviews, evaluations, and amendments under ISO 9001, 14001, 45001, and 50001 standards.

All employees are actively and continuously engaged in environmentally sound practices to protect the environment, health, and safety.

Thorough training and induction apply to both the Group's new employees and employees of external companies working at the production sites of the Group. The obligations to comply with environmentally sound practices, occupational health and safety principles and fire prevention are included in agreements with individual contractors.

Employee education also involves their familiarisation with policies, operating guidelines, organisational and management standards related to environmental protection, safety and health protection, fire protection, environmental aspects of their activities, and objectives and programmes defined for and applicable to their workplace.

The active role of employees is also supported by the established IDEA platform that encourages the Group's employees to forward their ideas to help meet and improve the ORLEN Unipetrol Group's objectives, including those related to the HSEQ.

4. Communication with the public

The following are the principal tools used by the ORLEN Unipetrol Group to communicate with the public:

- Applying the social responsibility principles (CSR) by the companies of the ORLEN Unipetrol Group to towns and municipalities in their vicinity.
- Informing about the company's impact on the local environment through participation of the ORLEN Unipetrol Group management representatives at public meetings of councils of neighbouring municipalities.
- Regular meetings with the mayors of the municipalities in the vicinity of the production plants, during which the participants inform about all activities, including those related to environmental protection, and receive information on any occurrence of non¬standard operating situations.
- Operating a green line by the Most and Kralupy Ecological Centres and internal communication sources (printed media, the intranet, email communication).
- Online connection of the company's alarm system at Chempark Záluží to the Police of the Czech Republic and the Litvínov and Most Municipal Police.
- Sending emergency SMS messages via an information channel for the towns of Most and Litvínov.
- Operating alerts, warning signal and sound systems at production sites and their surroundings.
- Providing information to the public via the Most and Kralupy nad Vltavou Ecological Centres.
- Cross-border cooperation with Saxony within a joint working group and through the Most Ecological Centre.
- Internet and social media: Facebook, Twitter, Instagram, YouTube and Linkedin.
- Interactive and educational programmes for primary and secondary school students, such as The Path to the Secret of Oil.

5. Integrated management systems policy

The Integrated Management System policy is based on the core values of the ORLEN Unipetrol Group and the PKN Orlen Group, i.e., **Responsibility – Development – People – Energy – Reliability**. In line with the strategic focus of the Group companies, the policy includes commitments related to occupational health and safety, environmental protection, quality, energy management, ethical standards, and protection of property.

The Integrated Management System policy is published on the website of each Group company.

6. Integrated management systems

The established management systems are a significant factor in environmental protection, product quality, occupational health and safety, fire protection and the prevention of major accidents. The ORLEN Unipetrol Group companies have a certified Quality Management System (QMS), Environmental Management System (EMS) and Health and Safety Management System (HSMS) in place as a guarantee of methodical access to customers and their needs, product quality and service delivery, environmental protection and occupational health and safety. Most companies have implemented and certified the Energy Management System (EnMS) and thereby declared their commitment to optimise energy use while also meeting the legal requirements of the Energy Management Act.

The above management systems are certified according to ISO 14001, ISO 9001, ISO 50001, and ISO 45001 since 2020, which replaced the OHSAS 18001 certification.

In May and June 2020, a recertification audit of QMS, EMS, HSMS and EnMS management systems took place in ORLEN Unipetrol companies, ORLEN Unipetrol RPA (incl. registered branches Benzina ORLEN and Polymer Institute Brno), ORLEN Unipetrol Doprava, and Petrotrans, to reflect the migration to the revised standard, ISO 50001:2018, and the new ISO 45001:2018 standard. The Lloyd's Register Quality Assurance certification organisation confirmed compliance with the system standards.

In June 2020, Paramo underwent a control audit by Lloyd's Register Quality Assurance covering all three systems – EMS, HSMS and QMS (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018).

In June and July 2020, Spolana successfully passed the QMS, EMS, HSMS and EnMS recertification audit conducted by TÜV Rheinland Česká Republika, s.r.o.

ORLEN Unipetrol RPA has a certified sustainability system for producing motor fuels with biofuels (ISCC). The latest audit, which verified compliance with the system requirements, was conducted in November 2020 by TÜV SÜD Czech s.r.o.

ORLEN Unipetrol Doprava has implemented a Safety and Quality Assessment System for Logistics Service Providers (SQAS). The system was successfully recertified in October 2018. The next certification is planned for the autumn of 2021.

Certified/verified ORLEN Unipetrol Group management systems in 2020

Company	ISO 9001	ISO 14001	ISO 45001	ISO 50001	SQAS	RC	ISCC
ORLEN Unipetrol	●	●	●	●		●	
ORLEN Unipetrol RPA (incl. Benzina ORLEN, registered branch	●	●	●	●		●	●
ORLEN Unipetrol RPA – PIB, registered branch	●			●			
ORLEN Unipetrol Doprava	●	●	●	●	●	●	
Paramo	●	●	●				
Spolana	●	●	●	●		●	

The certificates are published on the websites of individual Group companies.

7. Responsible Business in Chemistry programme – Responsible Care

The Responsible Care (the "RC") programme is a voluntary, worldwide initiative of the chemical industry aimed to promote the industry's sustainable development by improving the safety of operations at facilities and during product transport and protecting human health and the environment. The programme represents a long-term strategy coordinated by the International Council of Chemical Associations (ICCA) and the European Chemical Industry Council (CEFIC) in Europe. The contribution of the RC programme to sustainable development was acknowledged by a United Nations Environment award presented at the World Summit in Johannesburg.

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

The right to use the Responsible Care programme logo has been regularly granted to ORLEN Unipetrol, a.s., ORLEN Unipetrol RPA s.r.o., and ORLEN Unipetrol Doprava s.r.o. based on successful public defence in 2017. The three companies may use the Responsible Care logo until 2021, when they will publicly defend their rights.

Paramo is no longer a member of the Chemical Industry Association of the Czech Republic. Therefore, it does not use authorisation, although it continues to fulfil its principles.

Spolana defended the right to use the RC logo for the ninth time in 2018.

8. Compliance with environmental protection regulations

The fact that no violation of the requirements of environmental laws or imposition of sanctions took place in 2020 testifies to the consistent efforts to comply with environmental protection regulations.

The operating conditions and emission limits stipulated in the integrated permits for all ORLEN Unipetrol RPA facilities were met during 2020. In 2020, there was no violation of legislative requirements related to air, waste, water and soil protection.

All activities at ORLEN Unipetrol Doprava, Paramo and Spolana in 2020 were conducted in full compliance with environmental protection legislation.

9. Integrated pollution prevention

The obligations of selected industrial enterprises related to integrated pollution prevention (IPPC) are regulated by Act No. 76/2002 Sb., as amended. All ORLEN Unipetrol RPA production units, including the refineries in Litvínov and Kralupy nad Vltavou, fall under the IPPC Act and have valid integrated permits issued by the Regional Authorities of the Ústí and Central Bohemian Regions. These permits are continuously updated in connection with the requirements of the amended legal regulations and the fulfilment of conditions, implementation of investment projects, changes in technological equipment or changes in the substances used. During 2020, a total of 13 amendments to integrated permits were issued for ORLEN Unipetrol RPA facilities. They included, for example, the following:

- Revocation of the terms and conditions for conducting the functional test of the pyrolysis fraction dosing at the production unit of gas oil hydrogenation and extended deadline related to implementing the sewerage system renovation in the Litvínov Refinery until the end of 2021.
- Updates of the respective emergency plans and operating guidelines of production facilities.
- The permit to operate the stationary source in the polyethylene production facility (PE1) was revoked in connection with its terminated operations.
- The Ústí Regional Authority was notified of the launched trial operation of a new energy unit of the steam cracker.
- Notification of the planned construction of a new pyrolysis furnace, BA 111, and determining the operating conditions.
- The remaining funds for the project of 'Kopisty station's distributing tank's reclamation and renovation' were drawn".
- The condition of the integrated permit for the 'Energy services unit' related to the water quality monitoring taken from the surface flow was cancelled.
- A material change in the IP for the 'Energy services unit' granted an exemption from the Hg emission level associated with BAT to the operator of the T700 heating plant.
- Notification of new water management projects: building a new unit for sulphide lye purification and the project of refurbishing the technology of oil-polluted water purification and gradual centralisation of all pre-treatment and treatment facilities in Block 66 and Block 68.
- Notification of the planned termination of the operation of boilers of the steam cracker's energy block.
- Notification of the terminated operation of Boiler K20 of the T700 heating plant.

Further to the BAT-related conclusions regarding the common wastewater and waste gas treatment systems in the chemical industry (CWW), a review of the integrated permit for the steam cracker was conducted in 2020. The review was carried out under the Integrated Prevention and Pollution Prevention Act. It found that the conditions are being met, are up-to-date, and in line with the respective BAT-related conclusions.

Through its technical working group set up by the Czech Ministry of Industry and Trade, ORLEN Unipetrol RPA joined the preparations of a document about the best available techniques for the treatment of gases from the chemical industry.

All technologies operated by Paramo have valid integrated permits. CC Pardubice acquired a joint integrated permit for the Energy, Asphalts, Fuels and Oils operations, issued by the Pardubice Regional Authority. During 2020, the IP was updated once (implementation of a specific emission limit, TOC, for the VRU recuperation unit, including determining conditions for emissions measurements, approval of operating guidelines for stationary sources – Boiler house, Shipping BA95-Terminal, Storage tanks for oil hydrocarbons). CC Kolín received one integrated permit issued by the Central Bohemian Regional Authority. The IP was not updated in 2020 (subsequent amendment first in January 2021.

Spolana has four integrated permits to operate its facilities. In 2020, the Regional Authority issued four amendments to the integrated permits. They concerned extensions for the permit to discharge wastewater into surface waters, the addition of water monitoring under the BAT for the joint wastewater and waste gas treatment systems, the addition of a condition for extraordinary – emergency wastewater discharge, approval of revised emergency plans, and an exception in the emission level associated with the best available techniques for NO_x for the cracking furnace, and modifications in the emissions limits for NO_x at the K4 gas boiler under applicable legislation.

10. Overview of valid integrated operating permits

Production unit	Integrated permit (issued by)
ORLEN Unipetrol RPA	
Polypropylene and polyethylene production	Ústí Regional Authority
Steam cracker	Ústí Regional Authority
Ammonia production	Ústí Regional Authority
Mazut gasification plant	Ústí Regional Authority
Energy services unit	Ústí Regional Authority
Production of dicyclopentadiene and non¬hydrogenated C9 fraction	Ústí Regional Authority
Litvínov Refinery	Ústí Regional Authority
Kralupy nad Vltavou Refinery	Central Bohemian Regional Authority
Paramo	
Refinery plant, Cost Centre Pardubice	Pardubice Regional Authority
Cost Centre Kolín	Central Bohemian Regional Authority
Spolana	
Energetic materials and toxic waste landfill	Central Bohemian Regional Authority
Production of chlorine and sodium amalgam by electrolysis	Central Bohemian Regional Authority
Production of polyvinylchloride (PVC)	Central Bohemian Regional Authority
Caprolactam and sulphuric acid production	Central Bohemian Regional Authority

11. Emissions into the environment

Pollutant emissions into the environment stabilised over the past five years thanks to substantial green investments made in the previous decade. Individual emissions into the environment are listed in the following chapters.

11.1 Wastewater discharge

The amount of discharged wastewater in ORLEN Unipetrol RPA corresponds to the long-term average of the amount released and is partly affected by the total precipitation. The concentration of pollutants in wastewater shows a long-term steady state, and the volume of pollutants is directly proportional to the amount of wastewater discharged. In terms of the amount of water and the respective content of pollutants, the year 2020 did not deviate significantly from the values of recent years.

The wastewater treatment plant at the Kralupy Refinery underwent extensive refurbishment in the years 2013–2015. In 2016–2017, the treatment plant commenced a two-year trial operation and started operating permanently on 1 January 2018. We are now monitoring the level of reduction in discharged pollution. In 2019, the validity of the existing limits for wastewater discharges was extended until 31 December 2023. In 2020, we managed to reduce the amount of NO_x discharged.

The amount of pollution discharged at Spolana is steady, except for mercury, whose quantity has been drastically reduced.

The rate of transferred wastewater pollution at Paramo has not changed significantly over the years. A slight decrease in pollution (at CC Pardubice) has taken place because of the terminated intensive groundwater remediation pumping into the sewerage system as part of the HZ PARAMO (Stage 1 A) remediation and the hydraulic groundwater protection (HOPV) system. Wastewater pollution at CC Kolín (recipient: Hluboký potok) is steady.

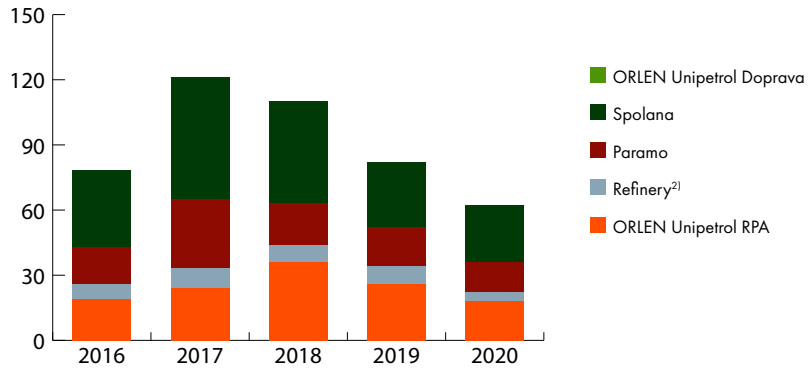
The balance of wastewater pollution indicators for the Benzina registered branch cannot be furnished, as the monitored parameters in the petrol station network are not consistent and cannot be included in the overall overview. In the comprehensive assessment of individual petrol stations, the monitored parameters have not exceeded the value of 'm'.

The pollution contained in the wastewater of ORLEN Unipetrol Doprava is directly proportional to the number of performed cleanings of equipment containing harmful substances.

Pollutants discharged via wastewater by the Group (t/year)[1)]

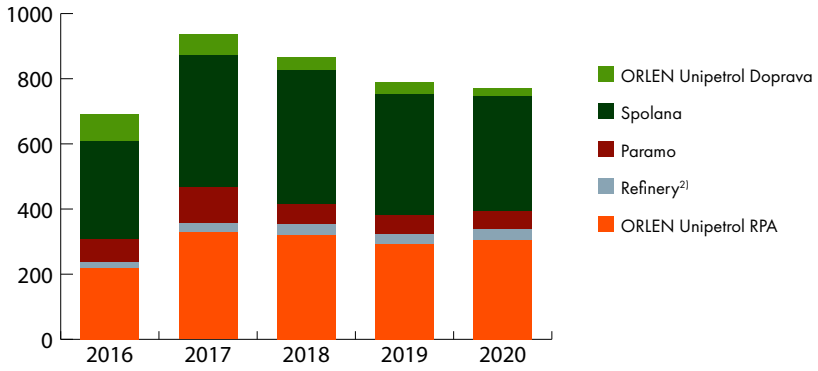
Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	BSK_5	19	24	36	26	18
Refinery[2)]	BSK_5	7	9	8	8	4
Paramo	BSK_5	17	32	19	18	14
Spolana	BSK_5	35	56	47	30	26
ORLEN Unipetrol Doprava	BSK_5	0	0	0	0	0
ORLEN Unipetrol Group	BSK_5	**78**	**121**	**110**	**828**	**62**

[1)] The registered branch Benzina is not flatly monitored, and representative data cannot be evaluated.
[2)] Only the Kralupy location. There is no direct discharge in Litvínov.



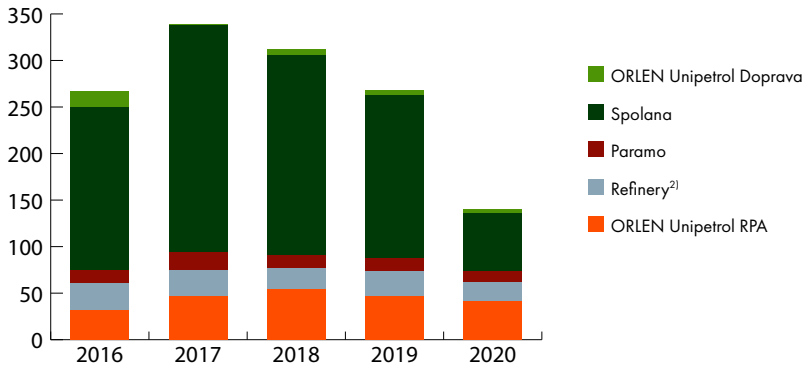
Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	$CHSK_{Cr}$	220	328	321	293	305
Refinery[2)]	$CHSK_{Cr}$	18	28	32	29	31
Paramo	$CHSK_{Cr}$	69	110	62	61	57
Spolana	$CHSK_{Cr}$	301	407	412	370	352
ORLEN Unipetrol Doprava	$CHSK_{Cr}$	82	63	39	36	26
ORLEN Unipetrol Group	$CHSK_{Cr}$	**690**	**936**	**866**	**789**	**771**

[1)] The registered branch Benzina is not flatly monitored, and representative data cannot be evaluated.
[2)] Only the Kralupy location. There is no direct discharge in Litvínov.



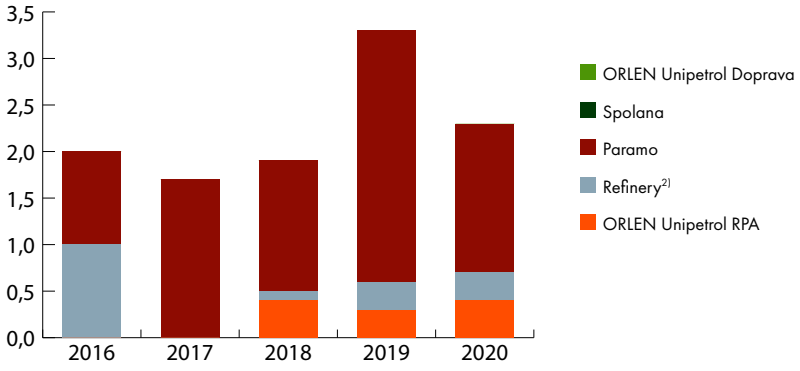
Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	suspended solids	32	47	54	47	41
Rafinérie[2)]	suspended solids	29	27	23	26	21
Paramo	suspended solids	13	20	13	14	11
Spolana	suspended solids	176	244	215	176	63
ORLEN Unipetrol Doprava	suspended solids	16,7	0,38	7	5	4
ORLEN Unipetrol Group	suspended solids	**267**	**338**	**312**	**268**	**140**

[1)] The registered branch Benzina is not flatly monitored, and representative data cannot be evaluated.
[2)] Only the Kralupy location. There is no direct discharge in Litvínov.



Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	petroleum substances	0	0	0,4	0,3	0,4
Refinery[2)]	petroleum substances	1	0	0,1	0,3	0,3
Paramo	petroleum substances	1	1,7	1,4	2,7	1,6
Spolana	petroleum substances	-	-	-	-	-
ORLEN Unipetrol Doprava	petroleum substances	0	0	0	0	0
Skupina ORLEN Unipetrol	petroleum substances	**2**	**2**	**1,9**	**3,3**	**2,3**

[1)] The registered branch Benzina is not flatly monitored, and representative data cannot be evaluated.
[2)] Only the Kralupy location. There is no direct discharge in Litvínov.



11.2 Waste management

The increase in the amount of waste in ORLEN Unipetrol RPA in 2020, including the Litvínov Refinery, was caused by a higher amount of cleaning operations associated with the turnaround work in the company. Waste production in the Kralupy Refinery was comparable to its output in the previous year. The moderately lower generation of waste at Paramo in 2020 was due to fewer implemented investment projects. Yet, there was no major change in the amount of waste compared to the previous year.

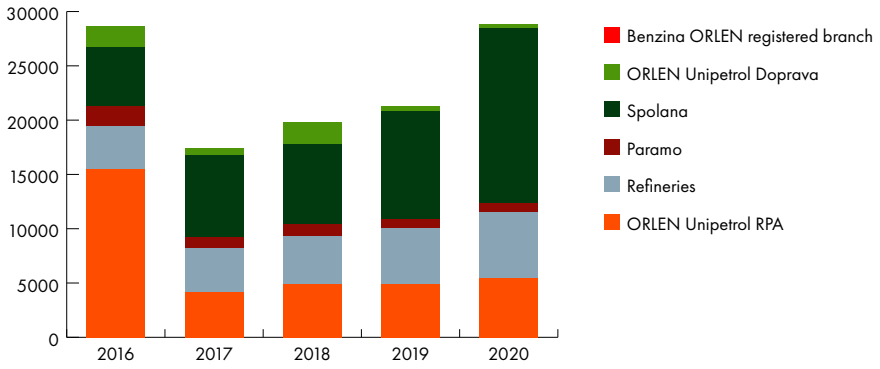
Lower waste amounts at ORLEN Unipetrol Doprava are related to the final closure of the flushing station in Neratovice and the relocation of the railway maintenance section (maintenance of the track superstructure, subbase, and FM) to ORLEN Unipetrol RPA.

The increase in the production of hazardous waste in Spolana is related to the shutdown of amalgam electrolysis. Higher production of other waste is associated with the disposal of metal waste.

In the Benzina ORLEN registered branch, the balance does not include all waste generated by petrol stations but only waste produced from investment projects and other contracts. Petrol station tenants operating as independent business entities are the producers of the remaining waste.

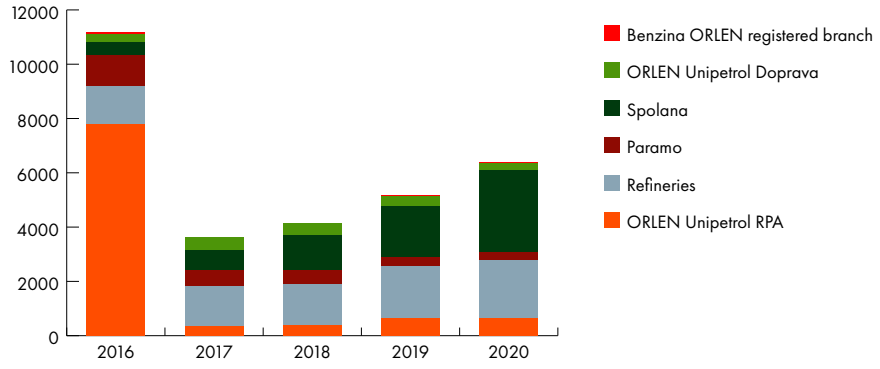
Waste produced by the Group (t/year) – total

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	15514	4165	4932	4896	5439
Refineries	3928	4003	4409	5180	6092
Paramo	1796	1079	1072	788	796
Spolana	5489	7510	7364	9997	16152
ORLEN Unipetrol Doprava	1870	633	1985	387	362
Benzina ORLEN registered branch	52	16	28	16	18
ORLEN Unipetrol Group	**28648**	**17405**	**19790**	**21264**	**28859**



Waste produced by the Group (t/year) – only hazardous waste

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	7787	347	369	651	651
Refineries	1421	1470	1546	1915	2109
Paramo	1128	591	494	297	316
Spolana	473	759	1285	1907	3020
ORLEN Unipetrol Doprava	300	463	443	372	269
Benzina ORLEN, registered branch	49	2	7	10	2
ORLEN Unipetrol Group	**11158**	**3633**	**4144**	**5152**	**6367**



11.3 Air protection

In most parameters, total refinery emissions were lower in 2020 compared to the previous years. There was a significant reduction of SO_2, where the autumn 2018 start of dosing of the $DeSO_x$ additive at the fluid cracking unit at the Kralupy Refinery had a positive effect.

In 2020, emissions at ORLEN Unipetrol RPA had already stabilised and were reduced mainly due to investment projects at the T700 heating plant and strict adherence to operational discipline, which results in fewer failures. A more significant rise could be seen only in the case of solid pollutants, resulting from the more than one-month lasting repairs of one desulphurisation line at the T700 heating plant.

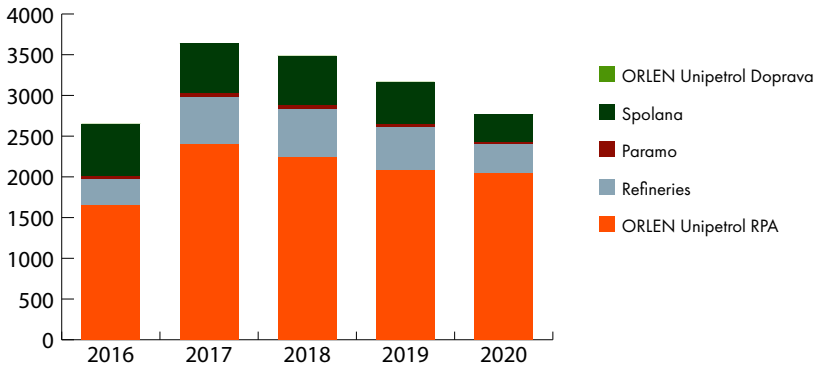
At Paramo, only natural gas was burned in the boiler houses at CC Pardubice and CC Kolín, which in the long term led to low emissions of sulphur dioxide, solid pollutants, and volatile organic compounds. Low emissions from combustion processes have been achieved despite increased oil processing in Kolín. This result was also because of eliminating air pollution sources during fuel operation and limiting the total power input of the boiler room at CC Pardubice, where only the K1 boiler was operated, the K2 boiler was used as a backup source, and the K3 boiler was disconnected. For the company to be able to meet the new emission limits that are in effect from 1 January 2020, the existing burners have been replaced with new low-emission burners at the CC Kolín boiler house. Higher VOC emissions occurred at CC Pardubice due to the launch of a new recuperation VRU unit.

At Spolana, SO_2 emissions and solid pollutants decreased because of terminated operation of coal-fired boilers. NO_x emissions fell, as well.

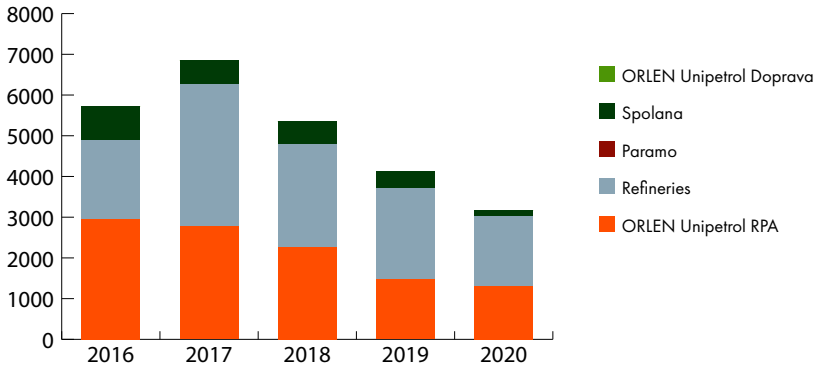
At ORLEN Unipetrol Doprava, the quantity of VOC used at the cleaning and steaming station of road tankers and rail tankers was lower in 2020 than in the previous years due to fewer tankers cleaned for the VOC-emitting media.

Pollutants released into the air by the Group (t/year)

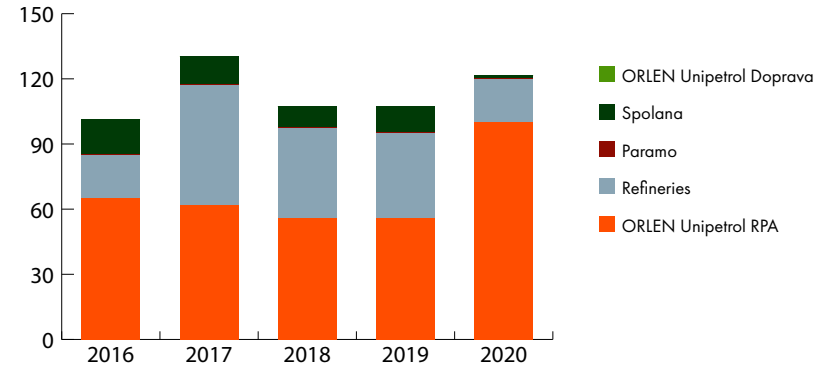
Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	NO_x	1648	2400	2237	2077	2039
Refineries	NO_x	322	582	599	540	365
Paramo	NO_x	36	39	42	28	24
Spolana	NO_x	644	616	609	523	335
ORLEN Unipetrol Doprava	NO_x	0,0	0,0	0	0	0
ORLEN Unipetrol Group	NO_x	**2650**	**3637**	**3487**	**3168**	**2763**



Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	SO_2	2959	2771	2261	**1470**	1317
Refineries	SO_2	1934	3490	2534	2236	1707
Paramo	SO_2	2,7	1,3	0,37	0,03	1,1
Spolana	SO_2	811	585	557	416	148
ORLEN Unipetrol Doprava	SO_2	0,0	0,0	0	0	0
ORLEN Unipetrol Group	SO_2	**5707**	**6847**	**5352**	**4122**	**3073**

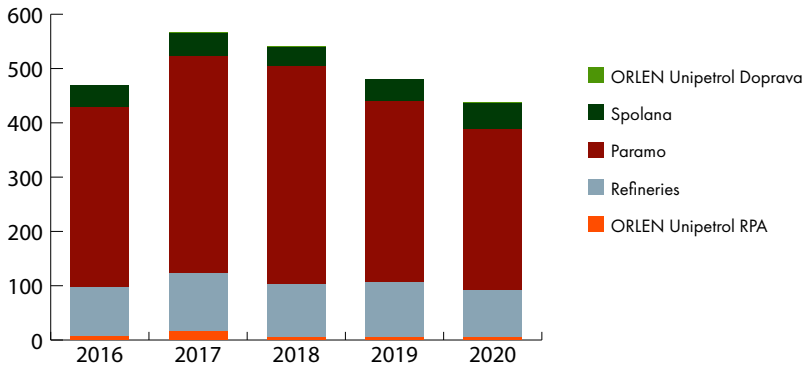


Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	Solid pollutants	65	62	56	**56**	100
Refineries	Solid pollutants	20	55	41	39	20
Paramo	Solid pollutants	0,4	0,5	0,52	0,46	0,42
Spolana	Solid pollutants	16	13	9,8	12	1
ORLEN Unipetrol Doprava	Solid pollutants	0,0	0,0		0	0
ORLEN Unipetrol Group	Solid pollutants	**101,4**	**130,5**	**107,3**	**107,5**	**121,4**



Company	Indicator	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	VOC	7	15	5	5	4
Refineries	VOC	90	107	97	101	87
Paramo	VOC[1)]	332	400	402	335	297
Spolana	VOC[1)]	40	43	35,3	39	49
ORLEN Unipetrol Doprava	VOC	1,3	1,1	0,9	1,1	1
ORLEN Unipetrol Group	VOC	**470**	**566**	**540**	**481**	**438**

[1)] 90% are fugitive emissions, which are only reported based on the purchase of solvents in the given calendar year.



11.4 CO_2 emissions and emission allowances trading

Regulation of carbon dioxide emissions under the EU scheme for carbon dioxide emission allowance trading (EU ETS).

In the third trading period of 2013–2020, the number of monitored CO_2 sources of emissions significantly increased, and the methods for calculating, monitoring, and reporting CO_2 sources of emissions changed. Calculating freely allocated emission allowances has also undergone a substantial change.

Allowance allocation to ORLEN Unipetrol Group companies under the 2013–2020 National Allocation Plan and actual CO_2 emissions in 2013–2019

Allocation of allowances (thousands of pieces) Actual emissions (kt/yr)	ORLEN Unipetrol RPA	Registered branch Rafinery1)	Paramo	Spolana	ORLEN Unipetrol Group
Total allocation for the 2013 – 2020 period	**10 159[1)]**	**6 494**	**445**	**1051**	**17 333**
2013: Actual CO_2 emissions	3 062	772	47	232	4 113
2014: Actual CO_2 emissions	3 138	877	37	251	4 303
2015: Actual CO_2 emissions	2 841	888	36	239	4 004
2016: Actual CO_2 emissions	2 491	678	37	233	3 439
2017: Actual CO_2 emissions	3 324	954	42	207	4 527
2018: Actual CO_2 emissions	3 210	880	43	204	4 337
2019: Actual CO_2 emissions	3 221	941	40	159	4 361
2020: Actual CO_2 emissions	2 875	764	40	81	3 760

[1)] In 2017, ORLEN Unipetrol RPA and Česká rafinérská were merged. Up to 31 December 2018, the refineries were registered and kept as the 'Rafinérie' registered branch.

According to the calculated emissions for 2020, it can be noted that the allocated annual amount of allowances at ORLEN Unipetrol RPA, including refinery units, covers approximately 48% of annual emissions. The 2020 allowance deficit was resolved through a purchase of allowances on the market. The lower total emissions were caused by the planned turnaround of the production facility. In 2019, an independent verifier verified applications for a free allocation for the fourth trading period of the EU ETS system, and they were submitted to the Ministry. The free allowances will be allocated after the values of the relevant benchmarks and correction factors have been updated in 2021, and their amount will be amended depending on the verification

outcome of the reports about facility activities in the years 2019 and 2020. In 2020, operating data were audited for the submission of an application for the compensation of indirect costs resulting from the emissions-associated costs reflected in electricity prices.

In Paramo CO_2 emissions in 2020 are at an unchanged level compared to the previous years. The deficit in allowances needed at CC Pardubice for exclusion for 2020 (due to the belated allocation of free allowances) was resolved through a transfer of a moderate EUA excess from CC Kolín. Hence, it is not necessary to buy EUAs on external markets.

In Spolana, CO_2 decreased due to the terminated operation of coal-fired boilers.

11.5 Other greenhouse gases

All Group companies operate production facilities in accordance with the Earth's ozone layer protection requirements and in line with existing international agreements. More environmentally friendly refills have replaced cooling media over the past few years.

12. Management of primary raw materials and energy sources

To conserve primary raw materials and energy sources, the ORLEN Unipetrol Group follows the principles of sustainable development. It focuses its basic strategies on innovative approaches to minimise energy and material use, promoting continuous improvement in environmental performance, and increasing energy efficiency. The Group companies have committed themselves to these principles within the Integrated Management System Policy and successfully underwent energy management system certification under ISO 50001. At some of the Group's companies, energy audits have been conducted to achieve additional energy savings.

As part of the Decarbonisation programme, ORLEN Unipetrol RPA is developing a comprehensive strategy for reducing greenhouse gas emissions. Within the ORLEN Corporate Group, ORLEN Unipetrol has committed to meeting the carbon neutrality goals by 2050. Minimising energy losses within the 'Zero Tolerance' programme remains one of the significant objectives. This programme includes the large-scale replacement of insulation, a significant renovation of condensate systems, and regular removal of steam compression losses. A total of CZK 113.9 million was allocated to this programme in 2020, which represents a year-on-year rise. Within the Capital Group, an increasing emphasis is made on the continued implementation of energy-efficient and innovative solutions (reducing energy consumption, raw materials and waste and wastewater production). Accordingly, the results of this pursuit are critical parameters in the evaluation and approval of the project by investment commissions.

In 2020, the mechanical completion of the New Steam Cracker Boiler House project took place, and the process of starting the new technological equipment began. The final phase of the project and the full operation of the facility are planned for 2021. This project is a key priority in ensuring the stable operation of the steam cracker while complying with the strictest legislative requirements. After successfully implementing the 'Combustion One' pilot project on the BA-107 furnace, it was decided to continue the project in other pyrolysis furnaces, i.e., BA-108 – BA-110. This second stage of the project is already being implemented. The Combustion One project has also been newly implemented in the CCR unit furnace.

The preparatory phase of the New Energy Source project in Chempark Záluží continues. A new gas heating plant will make a notable contribution to the efficient use of fuels and at the same time significantly reduce emissions of discharged substances according to all legislative requirements (including CO_2 emissions). Optimal variants are now being assessed, both in terms of capital expenditures and, above all, in terms of the required capacity. We continue developing the area of Advanced Process Control (APC). The APC system is being installed at the T700 heating plant, which will significantly contribute to optimising operation and savings of primary raw materials, especially lignite. The APC system used in the T700 HP will focus on the optimisation of the combustion process.

The EnMS Visual MESA tool is an essential step towards optimal energy consumption and use. It allows the best use of fuels and other media across the entire Chempark Záluží complex, from energy generation at the T700 HP and consumption at all production units, i.e., refinery, petrochemical and agrochemical sections. The project was completed at the end of 2019. It was debugged in 2020 and launched into full use. The main benefit is that the created model evaluates individual technologies as a whole and seeks the optimum within the entire complex. It also allows searching for additional optimisation project ideas.

In refining units, great emphasis is placed on the best use of capacity, which contributes positively to the efficiency of energy consumed by production. To this end, initiatives to increase equipment reliability in this area are also continuing. The use and recovery of low-potential (waste) heat is a significant area, too. We have prepared a project of using heat from combustion products in the Kralupy Refinery for condensate pre-heating. In this field, we leverage the expertise of the Capital Group. Other projects include optimising the use of medium-pressure steam of the steam cracker, reducing the energy amount lost through a simple reduction, replacing with rotating reductions, or the Organic Rankin Cycle (OCR) and electricity generation. This area will continue to be developed in 2021, when the ORLEN Unipetrol Group joins international projects to implement innovative solutions.

Another field of innovation concerns Industry 4.0, where ORLEN Unipetrol is preparing pilot projects aimed at minimising losses, training operators and optimising production processes.

The Benzina ORLEN registered branch focuses mainly on water, electricity, and gas consumption at petrol stations. Energy consumption has been subject to regular monitoring since 2017. As of 2018, IoT media consumption meters (electricity, water, gas) are being installed at selected petrol stations under the 'Energy Management System' project. The aim is to gain accurate data on energy consumption and use this information to evaluate energy consumption at petrol stations through online monitoring regularly. The data will be used to compare and evaluate opportunities to reduce consumption. The installation of IoT energy meters at petrol stations continued in 2019. At the same time, necessary steps are taken to start remote data transfer from these meters (online monitoring). The use of electricity at petrol stations is also optimised by introducing low-energy appliances and technologies (LEDs).

In the Polymer Institute Brno registered branch, energy intensity is reduced mainly by installing new equipment. Most of all, we focus on savings in heating and water consumption. We have installed secondary water meters in several locations and improved the records for water readings and readings related to other significant energy consumption (hot water mains, electricity). In the first half of 2020, we installed thermostatic radiator valves

everywhere where the radiators had old valves or valves without a regulator. A significant 2020 project involved installing a completely new air--conditioning system, including air recuperation in the production hall. Here, we expect electricity savings through the operation of central extraction and savings in heating during winter (the filtered air returns to the hall). At the turn of 2020/2021, we started planning and preparing a study to renovate both buildings located at Cejl 62 b and Cejl 64. We expect an overall renovation project and a complete window replacement in the Cejl 62 b building. Once the renovations are completed, we expect significant savings in heating and water and electricity consumption. We have started and continue planning to implement and purchase low-energy appliances. Another notable project of the beginning of this year involves installing an industrial cooler to the double-worm extruder. We will install a new double-worm extruder in the Development Department in the second half of 2021. It will be connected to the industrial cooler, which is expected to result in additional water savings.

Paramo has long implemented projects to reduce energy intensity, contributing to the reduction of steam consumption used for heating products and pumping lines (using heat from steam produced by the incinerator to operate the Asphalt Plant). We optimise the length of pipeline routes (lowering heat losses in the pipes) and install thermal insulation at selected tanks. Great attention is also paid to insulation within the Zero Tolerance project regarding steam leaks and missing or damaged insulation.

New feed pumps were installed in Paramo to reduce electricity consumption.

The priority in improving energy efficiency in Spolana is to reduce the energy intensity of energy generation, heat distribution losses, energy intensity of production technologies and energy intensity of buildings. As part of the efforts related to improving the energy efficiency of thermal energy generation, the company built and commissioned a new gas boiler house with a total nominal output of approx. 70 t/h of medium-pressure steam. These steps led to the shutdown of the heating plant with cogeneration equipment. Optimisation of the length of thermal energy pipes also contributed to reduced losses in heat distribution, especially the terminated operation of all this infrastructure in the 'old plant'. Dimensions of the main steam distribution mains were modified, and the insulation of the VCM operations underwent revitalisation. Heat exchangers in selected buildings were converted to the local gas boiler house in connection with the shutdown of the heat distribution system in the company's commercial zone. The modernisation of the sulfuric acid plant and BDEP processing by an external company has the most significant impact on reducing the energy intensity of individual production plants. As part of the modernisation, we expect a higher specific heat production and increased production capacity of the operations resulting in lower natural gas consumption.

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

The first stage of modernisation of the locomotive fleet (Vectron, Bizon), which is part of the company's strategy, was completed. A purchase of four additional Vectron multi¬system locomotives was approved within the second stage. The first locomotive was delivered at the end of 2020. In addition to the expected savings in fuels and electricity, the multi¬system locomotives also help reduce the emission load. Also, electricity meters were installed on the locomotives halfway through 2019, allowing recuperation measurements. As a result of the recuperation, the locomotives returned 570 MWh of electricity to the distribution system by the end of 2020.

Technological equipment is also being continuously modified together with the adjustment of technological procedures. Since 2016, sidings have been technically modified, e.g., photocells have been installed on the lighting towers of the siding yard. Controls for the heating of Building No. 6419 were installed. In 2019, the first stage of the installation of energy-saving luminaires replacing the original ones in the ORLEN Unipetrol RPA complex at Litvínov siding took place and a change of the heating system of switches, installation of heating control, and the thermal insulation of buildings. The time needed for steaming and cleaning railcars has been reduced.

Water consumption by the Group (mil. m³/year)

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	14,3	18,4	18,2	18,5	16,1
Kralupy Refinery	2,3	2,0	2	2,2	1,9
Paramo	0,3	0,4	0,4	0,4	0,3
Spolana	16,3	15,8	16,2	15,9	12,1
ORLEN Unipetrol Group	**33,2**	**36,7**	**36,8**	**36,8**	**30,4**

The positive trend is mainly because of specific energy consumption thanks to using production capacities. This has always had a positive impact on the use of energy and raw materials, and it is, therefore, more appropriate to monitor the energy consumption coefficient in tonnes of oil equivalent (TOE) per tonne of production per year:

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

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	7,9	9,2	9,1	9	8,6
Litvínov Refinery	8,0	9,6	9,9	10,2	8,1
Kralupy Refinery	6,0	7,7	7,5	7,9	7,1
Paramo	0,8	0,5	0,892	0,868	0,83
Spolana	3,2	3,4	2,7	2,6	2,0
ORLEN Unipetrol Group	**25,9**	**30,4**	**30,1**	**30,6**	**26,63**

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

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	0,291	0,141	0,143	0,151	0,158
Litvínov Refinery	0,050	0,045	0,045	0,047	0,050
Kralupy Refinery	0,062	0,050	0,057	0,053	0,059
Paramo, CC Pardubice	0,147	0,135	0,123	0,134	0,148
Paramo, CC Kolín	0,240	0,290	0,317	0,281	0,304
Spolana	0,156	0,147	0,117	0,126	0,119

13. Environmental investments

Environmental investments are defined as investment projects directly triggered by environmental legislation and closely linked to the application of integrated pollution prevention in practice or having a significant, positive environmental impact.

In 2020, the following environmental investments were made in the Group:

Refineries

The Refinery units (Rafinérie) implemented investment projects in environmental protection valued at CZK 60 million. The most important were:

- reconstruction and renovation of sewerage and sloping systems at Litvínov and Kralupy refineries
- revamp of the sewerage system (troughs) on Block 25
- tank roof drainage modifications
- revitalisation of the existing pipelines from the Kralupy Refinery WWTP to the recipient Vltava

ORLEN Unipetrol RPA

ORLEN Unipetrol RPA implemented investment projects in environmental protection in the total amount of CZK 398 million. The most important were:

- Construction of a new steam cracker boiler house
- Renovation of the Celio sump
- Consolidation of chemical storage
- Addressing sulphide lyes in wastewater
- Zickert facility renovation

Several other measures with a positive impact on the environment took place within facility maintenance costs.

Paramo

Paramo implemented investment projects in environmental protection in the total amount of CZK 2.65 million. The most important was the steam pump replacement at RDS in PARAMO, CC Kolín.

Spolana

Spolana implemented investment projects in environmental protection in the total amount of CZK 22.2 million. The most important were:

- Construction of a new energy centre - continuation
- Sewerage renovation

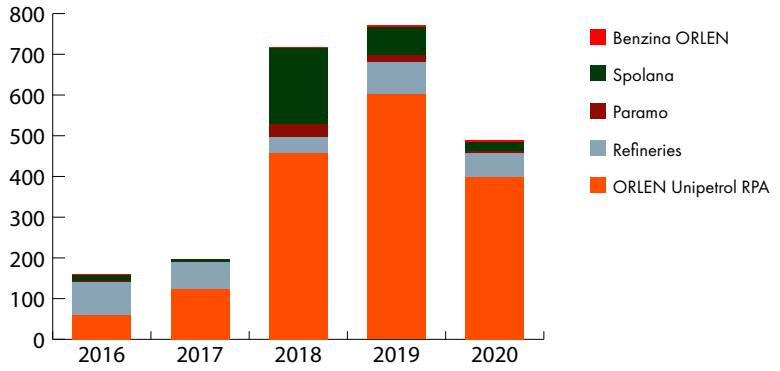
Benzina ORLEN, registered branch

The Benzina ORLEN registered branch implemented investment projects in environmental protection in the total amount of CZK 6.7 million. The investment focused primarily on:

- New water connections and cancellation of individual drinking water supply
- Installation of a new wastewater treatment plant
- Replacement of emergency sumps
- Modified drainage of secured areas related to water management

Capital expenditure on environmental protection at the Group (mil. CZK/year)

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	59	124,4	458	601	398
Refineries	81	64	38	81	60
Paramo	2	0,4	33,5	15,4	2,7
Spolana	15,9	8,2	186,4	70,5	22,2
Benzina ORLEN	0,3	0,097	2	2,5	6,7
ORLEN Unipetrol Group	**158**	**197**	**718**	**770**	**490**



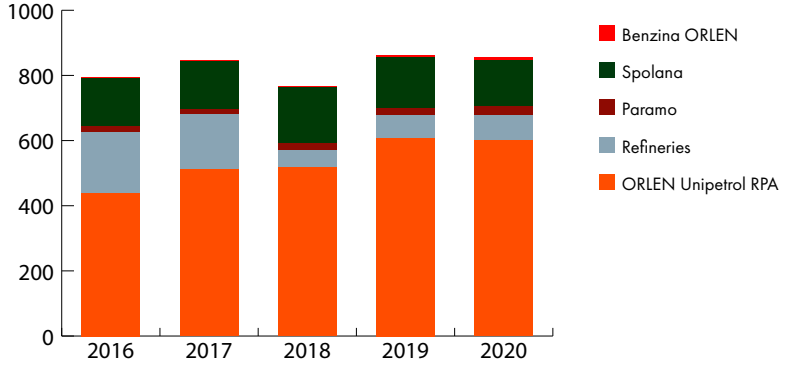
14. Environmental operating expenses

Costs associated with operating installations for air protection, wastewater treatment, waste management, environmental management systems, emissions monitoring, environmental impact assessment (EIA process), integrated pollution prevention and other related environmental activities are called environmental operating expenses.

Recently installed modern technologies with a high degree of raw material conversion, reduced amounts of waste and high energy efficiency have resulted in an overall reduction in environmental operating expenses compared to the previous decade. Total environmental operating expenses have been more or less stable in the past decade.

Environmental protection operating expenses at the Group in the years 2016-2020 (mil. CZK/year)

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	439	512	516	608	601
Refineries	187	168	55	70	77
Paramo	17	17,4	19,8	22,4	25,8
Spolana	148	145	172,2	154	144
Benzina ORLEN	3	4	4	8	8
ORLEN Unipetrol Group	**794**	**846**	**767**	**862**	**855**

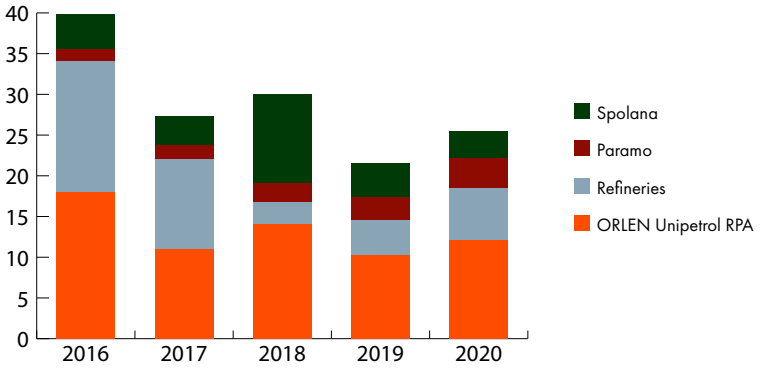


15. Total costs of environmental protection

The total environmental protection costs for the ORLEN Unipetrol Group include environmental investment costs, environmental protection operating expenses, costs of cleaning up previous environmental damage, expenses for air pollution, wastewater discharge, waste disposal in landfills, provisioning for landfill reclamation, and compensation for damage to forests by pollution.

Fees and payments for environmental pollution at the Group in 2015–2020 (mil. CZK/year)

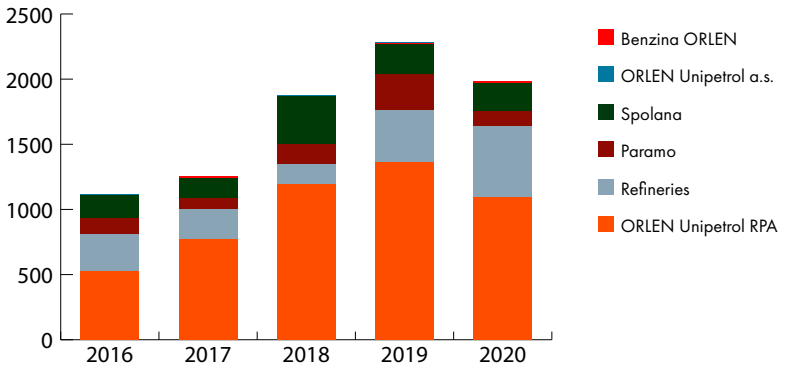
Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	18	11	14	10,3	12,1
Refineries	16	11	2,8	4,2	6,3
Paramo	1,5	1,8	2,3	2,9	3,7
Spolana	4,3	3,5	10,9	4,1	3,4
ORLEN Unipetrol Group	**40**	**27**	**30**	**22**	**26**



The total costs of environmental protection in the Group in 2020 reached almost CZK 2 billion.

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

Company	2016	2017	2018	2019	2020
ORLEN Unipetrol RPA	524	771	1192	1362	1097
Refineries	284	233	158	400	541
Paramo	129	79	146,2	274,5	119,03
Spolana	170	158	369,5	229	211
Benzina ORLEN	7	9	7	8	8
ORLEN Unipetrol a.s.	1,3	1,3	1,3	1,3	1,6
ORLEN Unipetrol Group	**1115**	**1251**	**1874**	**2275**	**1978**



16. Remediating old environmental burdens

Based on the decision of the Government of the Czech Republic related to privatisation, the ORLEN Unipetrol Group companies entered into the following agreements with the Ministry of Finance of the Czech Republic to resolve ecological commitments sustained before privatisation (Ecological Agreement):

1) Ecological Agreement No. 14/94, as amended by Amendment 4 of 6 May 2019, concluded with Unipetrol
2) Ecological Agreement No. 32/94, as amended by Amendment 2 of 6 May 2019, concluded with Unipetrol
3) Ecological Agreement No. 39/94, as amended by Amendment 4 of 28 January 2019, concluded with Paramo
4) Ecological Agreement No. 58/94, as amended by Amendment 5 of 28 January 2019, concluded with Paramo
5) Ecological Agreement No. 184/97, as amended by Amendment 9 of 18 June 2019, concluded with registered branch Benzina
6) Ecological Agreement No. 33/94, as amended by Amendment 1-4, concluded with Spolana

Decontamination and remediation are being carried out under the ecological agreements. They are in various stages of completion. **The current overview is given in the table:**

Litvínov

Location	Current status	Further steps
Růžodol ponds	Pending selection of the contractor for landscaping and reclamation	Contractor selection, the launch of landscaping
Plant premises	Contamination clouds Nos. 1, 2c, 3, 6, 10: remediation completed and handed over; post-remediation monitoring performed at contamination cloud No. 4; remediation evaluation to be carried out at contamination cloud 9; remediation work on contamination clouds Nos. 2, 5, 7, 11 and in Block 32 not finished yet	Project documentation for selecting the remediation contractor for KM 2a, 11 and 7b, selecting a contractor for KM2a, 11 and 7b, the continuation of the remediation or post-remediation monitoring at other clouds
Uhlodehta landfill	Pending additional survey as part of the execution of a risk analysis update	Updated risk analysis
Solid industrial waste landfill	Updated risk analysis before completion	Depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Lime sludge landfill II	Updated risk analysis before completion	Depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Lime sludge landfill at the siding	Updated risk analysis before completion	Depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Jižní předpolí/South foreland	Partly reclaimed, updated risk analysis before completion	Depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Fly ash dumps	Partly reclaimed, updated risk analysis before completion	Depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Contamination cloud No. 13	Protective remediation pumping is being done at the cost of the acquirer (ORLEN Unipetrol, a.s.)	Remediation feasibility study
'Nová voda střed' reservoir pumping	Protective remediation pumping	Protective remediation pumping and depending on the conclusions of the updated risk analysis and the related ČIŽP decision
Růžodol contamination cloud No. 12 drain pumping	Protective remediation pumping	Protective remediation pumping and depending on the conclusions of the updated risk analysis and the related ČIŽP decision

Kralupy nad Vltavou

Location	Current status	Further steps
Plant premises	Updated risk analysis (AAR)	Additional survey and remediation project documentation
Nelahozeves landfill	Pollution remediation	Pollution remediation, documentation updates, selecting a contractor for the remediation completion
Plant premises - contamination cloud E	Finalising a review of the remediation project documentation for the contractor selection	Pollution clean
"Gudrony" (acid tar waste from crude oil refining)	Feasibility study – verification and update	Pollution clean

Registered branch Benzina ORLEN (distribution warehouses and the most critical petrol stations)

Location	Current status	Further steps
Ostrava-Muglinov petrol station	Remediation implementation project	Pollution remediation
Točník distribution warehouse	Pollution remediation, protective clean pumping	Post-remediation monitoring
Liberec-Rochlice distribution warehouse	Additional pre-remediation survey	Protective remediation pumping Remediation implementation project
Šumperk distribution warehouse	Pending implementation project of the risk analysis update for the contractor selection, protective remediation/remediation pumping	Processing the risk analysis update
Bartošovice distribution warehouse	Pollution remediation	Post-remediation monitoring
Pardubice Chrudimská petrol station	Pollution remediation implementation project	Pollution remediation
Přelouč petrol station	Pollution remediation	Post-remediation monitoring
Nový Bohumín distribution warehouse	Pollution remediation	Post-remediation monitoring

Paramo Pardubice

Location	Current status	Further steps
Časy	Remediation implementation acc. to remediation completion project	Continued remediation acc. to remediation completion project
Hlavečník	Protective pumping of precipitation water	Protective pumping of precipitation water
Surroundings of the main plant – LIDL	The contract ended in May 2018	-
Surroundings of the main plant – U Trojice	Remedial pumping of bores and drains and monitoring	Continued remediation pumping and monitoring until 8/2021
Main plant – Stage 1 A	The contract ended in October 2020	-
Nová Ves	Post-remediation monitoring	Post-remediation monitoring

Paramo Kolín

Location	Current status	Further steps
Plant site and sludge lagoons	Processing the project documentation based on the approved risk analysis update	Implementing the remediation based on the approved project documentation

Spolana

Location	Current status	Further steps
Toxic waste landfill remediation	Remediation completed	Remediation completed
Remediation of buildings contaminated with dioxins	Remediation completed	Location maintenance
Remediation of old amalgam electrolysis	Remediation completed	Post-remediation monitoring
Groundwater remediation at petrochemistry	Special-purpose risk analysis update	Remediation project
Groundwater remediation - old plant	Feasibility study, special-purpose risk analysis update, new decision	Remediation project
Remediation of mercury contamination along the Elbe riverbanks	Ongoing remediation	Remediation completed, final report

Summary of financial guarantees of the Ministry of Finance of the Czech Republic and drawing of funds by the ORLEN Unipetrol Group as of 31 December 2020 (mil. CZK incl. VAT)

	ORLEN Unipetrol Litvínov	ORLEN Unipetrol Kralupy	Paramo Kolín	Paramo Pardubice	Benzina ORLEN, registered branch	Spolana	Group total
Financial guarantees of MF CR	6 012	4 244	1 907	1 241	1 323	8 159	**22 886**
Costs paid by MF CR in 2020	45,7	10,6	0,2	90,2	103,3	42,0	**292,0**
Costs paid by MF CR since the commencement of work	4 364	64	1 901	957	699	5 643	**13 628**
Expected costs of future works	2 488	778	1	2 275	857	2 373	**8 772**
Total (estimated) cost of remediation	**6 852**	**842**	**1 902**	**3 232**	**1 556**	**8 016**	**22 400**

17. Chemical safety

All Group companies manufacture or use chemicals and mixtures under the applicable Chemical Act and Regulation (EC) No. 1907/2006 (REACH). They classify their marketed chemical products per 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. According to the REACH Regulation, the safety data sheets of manufactured and purchased hazardous chemicals and mixtures are available to all employees at ORLEN Unipetrol RPA via the intranet computer network – CASES database (system for managing and making available safety data sheets).

The Group companies continuously meet the REACH requirement to maintain the registration documentation updated. Therefore, they must also secure that their IUCLID software application processing the technical documentation for registered and notified substances is in accordance with the latest version published on ECHA's website.

The Group concentrates on ongoing communication in the supply and demand chain to implement measures to protect employee health and the environment when hazardous chemicals are used directly or contained in mixtures. It monitors and applies any changes arising from updated processes associated with registering and classifying chemical substances and updates these changes in its safety data sheets.

All Group companies continuously monitor the handling of chemical substances and mixtures, from raw materials to finished products, and ensure compliance with applicable laws. The companies conduct internal and external testing and subsequently issue legal statements specifying the use of selected products, such as when they are in contact with food or drinking water or used for medical purposes. Through established customer services, the companies provide 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 Organisation for the Prohibition of Chemical Weapons (OPCW). All previous verifications carried out by government authorities and international reviews at the Group's companies have shown full observance of the Convention.

In the second half of 2020, ORLEN Unipetrol RPA started analytical testing of dicyclopentadiene (DCPD) and preparatory work to obtain registration for this chemical substance under REACH. It is a new product, and the company plans to include it in the existing product portfolio.

The registration documentation of a chemical substance where Paramo is the main registrant in the EU market was updated in 2020 (Lubricating oils/EC 278-012-2). In 2020, ECHA published an official requirement regarding additional testing of oxidised asphalts, with all members of the joint submission being financially involved in testing. All business activities related to potential BREXIT-related complications and migration to the UK REACH were also identified in detail. Paramo has long monitored the situation regarding the restrictions concerning 'N-methyl 2-pyrrolidine' (Restriction as per Annex XVII, REACH), which is used as an extraction agent in the selecting refining operations at CC Pardubice.

In August 2014, Spolana applied for authorisation to use trichloroethylene in the production of caprolactam under Article 56 of Regulation (EC) No 1907/2006 REACH to the European Chemicals Agency (ECHA). The authorisation was granted until 21 April 2020. To ensure the use of trichloroethylene even after this date, an application for a review of the authorisation was submitted to the European Chemicals Agency under REACH in 2018. As the deadline to apply for a review was met, the authorisation remains valid. No decision was issued in 2020.

18. Occupational safety and health protection and fire protection

The ORLEN Unipetrol Group considers occupational health and safety, process safety, and fire protection as one of the fundamental values of its policy.

In 2020, it continued systematic steps to apply a unified occupational health and safety management and fire protection system within the ORLEN Unipetrol Group. They resulted in a standardised approach to newly introduced processes and a plan to unify the safety requirements applied in each Group company gradually. Standardising the requirements within the entire PKN Orlen Group is an integral part of these efforts. In 2020, a unified system of requirements was applied to control risks during excavation work, investigate emergencies, work at heights and confined spaces.

The Group continued a unified system for monitoring selected performance indicators, defining the target values for 2020. We continued monitoring selected performance indicators in process safety (according to ANSI/API Recommended Practice 754, Process Safety Performance Indicators for the Refining and Petrochemical Industries). In 2020, only four events were classified as a Tier 1 Process Safety Event (T¬1 PSE) across the Group.

List of Tier-1 process safety events at the ORLEN Unipetrol Group in the years 2017-2020

Company	2017	2018	2019	2020
ORLEN Unipetrol RPA	6	4	4	2
ORLEN Unipetrol Doprava	0	0	0	1
PARAMO	1	1	0	0
SPOLANA	0	1	3	1
Group total	**7**	**6**	**7**	**4**

The ORLEN Unipetrol Group met the PSE frequency target values. The resulting values are listed in the table overview below.

In the process of the continuous improvement of security, the gradual implementation of the LOTO system (Lockout/Tagout locking/marking progress of the system of safe preparation of equipment for repair/maintenance) continued on all ORLEN Unipetrol RPA production units in 2020. In 2020, the implementation was completed at the Kralupy Refinery Agro Unit. The implementation at the Petrochemistry and ECO units – Water Management Section – continued. The implementation at the Litvínov Refinery Unit will start in 2021 and is planned to be completed by the end of 2021. The system of labelling and checks of machinery, tools, and equipment was implemented in 2020 as another element aiming to increase safety.

In 2019, wireless emergency signalling and communication units were deployed at the Paramo operations to protect lone working employees.

In 2020, Spolana prepared a tender for a new PPE supplier to be held in the first half of 2021. The tender aims to unify, streamline, and make the PPE management system more transparent to increase employees' protection and streamline the costs of these services. This tender is also part of the PKN ORLEN strategy. In 2020, HAZOP studies were performed for the following operations: Sulphuric acid, Ammonium sulphate, VCM. The HAZOP study for the Caprolactam operations was put off until 2021. The scaffolding condition improved in 2020 regarding three aspects. Establishment of a new job position, 'scaffolding specialist'; regular checks in operations and replacement of tubular scaffolding with sectional scaffolding.

Target safety results

ORLEN Unipetrol Group	2020 target	Resulting values
TRR: Number of injuries with subsequent absence per million hours worked	1,70	1,17
PSER – Tier 1: Number of process events per million hours worked	1,10	0,22

19. Prevention and personal protective equipment

Prevention in occupational safety is ensured by employees qualified in risk assessment who conduct inspections at individual workplaces. Personal protective equipment is provided to company employees according to the identified hazards and assessment of possible risks to life and health.

20. Quality of the working environment

According to work categories, working conditions at the ORLEN Unipetrol Group companies are regularly checked by measuring the working environment factors, especially employees' exposure to noise, chemicals, and dust.

21. Health care and prevention

ORLEN Unipetrol Group companies have concluded agreements with physicians to provide occupational health services. Preventive medical examinations are conducted in compliance with the relevant laws and internal regulations.

22. Prevention of major accidents

The ORLEN Unipetrol Group companies have been paying close attention to preventing major accidents for a long time. The basis for avoiding accidents is a reliable and trouble-free operation of production facilities. The facilities are designed, operated, inspected and maintained in accordance with Czech law and internal guidelines. Some of the regulations contain requirements beyond the law and are based on the best practices of the Group companies.

Production plants are equipped with control systems that signal any deviations from standard operating parameters. Some plants performing hazardous operations are fitted with automatic unit shutdown systems if specified operational parameters are exceeded. Depending on the type of hazardous substances they handle, the plants are equipped with modern detection systems (detection of flames, smoke, or release of hazardous substances) connected to signalling panels in their control rooms and the operation centres of the fire rescue service of the given company. Stationary and semi-stationary extinguishing systems and fire monitors are installed at the production plants.

Regular internal audits of safety and accident risk prevention are conducted at all ORLEN Unipetrol Group companies. Government technical supervisory bodies also conduct regular external audits and inspections. These bodies include, for example, the Czech Environmental Inspectorate (ČIŽP), Regional Labour Inspectorate (OIP), Fire Rescue Brigade (HZS), Regional Public Health Authority (KHS), professional organisations in the Czech Republic, insurance brokers, insurers and foreign reinsurers. The recommendations and findings of these audits are incorporated into the respective implementation plans.

The regular training and education of employees is an integral part of preventing major accidents. The functionality of the major accident prevention system is tested throughout the year through simulations of both emergency and crisis situations. Plant operation employees conduct the testing in cooperation with own and external intervention units in emergency exercises at individual plants and comprehensive emergency exercises performed in collaboration with companies managing the industrial premises or businesses in their vicinity. The emergency exercises at the ORLEN Unipetrol Group companies are carried out according to a plan. They serve as practical training for employees to adequately respond to potential accidents, verify the validity of emergency plans and procedures and improve the knowledge of all participants. If an exercise reveals any deficiencies, sufficient corrective measures are adopted from the exercise's evaluation, including deadlines for removing these deficiencies and designating personnel responsible for implementing measures.

Risk management of major accidents includes liability insurance in accordance with Act No. 224/2015 Sb., on the Prevention of Major Accidents, as amended.

The degree of safety at the Group companies is significantly affected by new investments in production facilities. Potential operational risks are already addressed at the project stage through generally accepted major accident risk assessment methods. Each new facility is always equipped with state-of-the-art safety systems that meet the legal requirements of the Czech Republic and the European Union.

Production Group companies have their fire rescue services with top-level equipment and training that enables them to carry out the highly specialised intervention in accidents associated with the release of hazardous substances. The Kralupy refinery unit uses the services of the SYNTHOS Kralupy, a.s. firefighters.

Most ORLEN Unipetrol Group production companies have a 'B' classification, which means they are subject to the strictest controls stipulated in Act No. 224/2015 Sb., on the Prevention of Major Accidents, as amended, in the handling of selected hazardous chemical substances/mixtures.

Overview of the categorisation of companies into groups under Act No. 224/2015 Sb., as amended

Company	location	group	Safety report
ORLEN Unipetrol RPA	Litvínov location	B	Updated Safety Report for ORLEN Unipetrol RPA in Chempark Záluží was approved on 13 February 2020
	Kralupy location	B	Updated Safety Report for ORLEN Unipetrol RPA (Kralupy Refinery unit) in the Chemické výroby Kralupy complex was submitted for approval by the Central Bohemian Regional Authority
	Benzina ORLEN, registered branch	-	Not subject to Act No. 224/2015 Sb. Reports on the non-inclusion of petrol stations under the law were updated and submitted to the relevant regional authorities
ORLEN Unipetrol Doprava	Operating Department, Pardubice Plant, Semtín, Pardubice railway operations	B	Approved by the decision of the Pardubice Regional Authority
	Operating Department, Pardubice Plant, Semtín, Semtín siding	B	Approved by the decision of the Pardubice Regional Authority
	Operating Department, Pardubice Plant, Semtín, Kolín siding	-	Not subject to Act No. 224/2015 Sb. Reports on the non-inclusion submitted to the Central Bohemian Regional Authority
	Operating Department, Litvínov siding plant	B	Approved by the decision of the Ústí Regional Authority
	Operating Department, Kralupy Plant, Neratovice, Kralupy railway operations	B	Approved by the decision of the Central Bohemian Regional Authority
	Operating Department, Kralupy Plant, Neratovice, Neratovice railway operations	B	Approved by the decision of the Central Bohemian Regional Authority
Paramo	Pardubice Cost Centre (CC Pardubice)	B	Updated Safety Report approved by the Pardubice Regional Authority on 8 September 2020
	Kolín Cost Centre (CC Kolín)	-	Not subject to Act No. 224/2015 Sb.
Spolana	Spolana	B	Update approved by the decision of the Central Bohemian Regional Authority

23. Major accidents

In 2020, two emergencies occurred in two ORLEN Unipetrol Group locations subject to Act No. 224/2015 Sb., on the Prevention of Major Incidents. They were reported as major accidents to the Regional Authorities of the Ústí and Central Bohemian Regions. On 23 November 2020, there was an ammonia leak under pressure during the completed loading of a rail tanker and disconnection of the filling arm from the side flanges of the liquid and gas phase. This accident resulted in an injury of an employee of ORLEN Unipetrol Doprava. The other emergency occurred at Spolana on 9 September 2020. A tapping hose separated from a flange on a rail tanker when tapping hydrochloric acid, and the acid leaked outside the technological equipment. The ORLEN Unipetrol Group implemented measures to eliminate the development of similar accidents in the future.

Other operating accidents occurring during the year were managed without any external intervention or with corporate firefighters' help. These situations were adequately rectified, and measures were taken to prevent them from recurring. The effects of minor operating accidents did not spread beyond the areas of the Group companies.

24. TRINS – Transport Information and Accident System

The Transport Information and Accident System (TRINS) helps deal with accidents when hazardous substances are transported. TRINS was created by the Association of Chemical Industry of the Czech Republic under the Responsible Care programme in 1996 in an agreement between the Association and the Headquarters of the Fire and Rescue Service of the Czech Republic and has been incorporated as one of the support schemes in the Integrated Rescue System of the Czech Republic. TRINS is similar, for example, to the British CHEMSAFE system or to the German TUIS, which served as models in creating TRINS. Similar systems have also been implemented in the Slovak Republic (DINS) and Hungary (VERIK) and have been operating for a long time in many other EU countries.

TRINS centres (in cooperation with the Fire and Rescue Services of the Czech Republic) provide urgent consultations concern¬ing information about chemical substances and products, their safe transport and storage, and practical experience with the handling and disposal of hazardous materials and emergencies associated with their transport. TRINS centres also provide practical assistance in eliminating emergencies, including removing subsequent environmental damage.

Currently, 21 regional TRINS centres are active in the Czech Republic. They are provided by 34 companies operating in the chemical industry. The ORLEN Unipetrol Group companies are founding members of TRINS. ORLEN Unipetrol RPA also acts as the system's national coordination centre.

In this report, the names of ORLEN Unipetrol Group companies (ORLEN Unipetrol, a.s., ORLEN Unipetrol RPA s.r.o., ORLEN Unipetrol RPA s.r.o. – BENZINA, odštěpný závod, 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 provided in their simple form (ORLEN Unipetrol, ORLEN Unipetrol RPA, Benzina ORLEN/Benzina ORLEN, registered branch, Polymer Institute Brno/PIB, ORLEN Unipetrol Doprava, Paramo, Spolana).

List of abbreviations:

ACHV – Chemical production site

APC – Adaptive Process Control

BAT – Best Avilable Techniques

BČOV – Biological wastewater treatment plant

BSK_5 – Biochemical oxygen demand

BZ – Safety report

CASEC – Chemical Abstract Substances Evidence Center

CEFIC – The European Chemical Industry Council

CLP – Classification, Labelling and Packaging of substances and mixtures – EP Regulation

CO_2 – Carbon dioxide

CONCAWE – Conservation of Clear Air and Water in Europe

ČIŽP (OI) – Czech Environmental Inspectorate (Regional Inspectorate)

Wastewater treatment plant (WWTP)

ČS –Petrol station

$DeSO_x$ – Technology for reducing sulphur oxide emissions

$DeNO_x$ – Technology for reducing nitrogen oxide emissions

DS – Distribution warehouse

EIA – Environmental Impact Assessment

ECHA – European Chemicals Agency

EJ – Steam cracker

EnMS – Energy Management System

EMS – Environmental Management System

EU ETS – EU Emissions Trading System

FCC – Fluid Catalytic Cracking Unit

FM – Facility Management

HOPV – Hydrogeological protection of groundwater

HRPO – Hydrogenation of gas oil

HS - Cost centre (CC)

HSMS – Health and Safety Management System

HZS – Fire Rescue Brigade

CHSK – Chemical Oxygen Consumption

ICCA – International Council of Chemical Associations

IP – Integrated permit

IPPC – Integrated Pollution Prevention and Control

ISCC – International Sustainability & Carbon Certification

KHS – Regional public health protection authority

LPG – Liquefied Petroleum Gas

MESA – Management of Energy System Application

MEK – Methyl ethyl ketone

MF CR – Ministry of Finance of the Czech Republic

NL – Suspended solids

NO_x – Nitrogen oxides

OIP – Regional Labour Inspectorate

OZ – Registered branch

QMS – Quality management system

PVC – Polyvinylchloride

REACH – Registration, Evaluation and Authorization of Chemicals – EU Regulation

RC – Responsible Care

RP – Paraffin solvent

SCHP ČR – Association of 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 – name of IT application (Management of Energy System Application)

VOC – Volatile Organic Compound

ZERO – A software application for central records of inspections and accidents at ORLEN Unipetrol RPA

ŽP – Environment