JOINT REPORT 2018

ON OCCUPATIONAL HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION
UNIPETROL GROUP

Unipetrol
ORLEN GROUP

Obsah

1. Introducing the UNIPETROL Group

The Group operates refineries and performs petrochemical production and sales in the Czech Republic and Central Europe. The Group's companies mainly produce and sell refinery products, chemical and petrochemical products, polymers and specialty chemicals. The Group also operates its own transportation services and finances its own research and development. UNIPETROL is the leading refinery 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,
- Retail sale of motor fuels.

UNIPETROL is the 100% owner of the following companies:

- UNIPETROL RPA – a manufacturer and vendor of refined petrochemical and agrochemical products. Since 1 January 2016, the following entities have been incorporated into the UNIPETROL RPA structure: registered branches (odštěpný závod) of Benzina, operator of the largest filling station network in the Czech Republic, the Polymer Institute Brno research centre, support activities for UNIPETROL Services. On 1 January 2017, Refinery Registered Branch (odštěpný závod Rafinérie), the Czech Republic's largest oil processor for a wide range of products with a total annual capacity of 8.7 million tonnes, was incorporated into the UNIPETROL RPA structure.
- UNIPETROL DOPRAVA – a professional railway transporter of chemical, petrochemical and other products, including provision of related services
- PARAMO – the largest manufacturer of bitumen, lubricants, fuel oil and other refinery products.
- SPOLANA – a part of the UNIPETROL Group since 2016 and manufacturer of polyvinyl chloride, caprolactam, sulfuric acid, oleic acid and ammonium sulfate.

The main products of the UNIPETROL Group are refinery and petrochemical products.

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

2. Important milestones of the UNIPETROL Group in 2017

The following milestones are considered the most important events of 2017 for the UNIPETROL Group from environmental and occupational health and safety perspectives:

- By shutting down amalgam electrolysis in 2017, SPOLANA is in line with the European Commission's Implementing Decision No. 2013/732/EU ordering the end of use of mercury electrolysis in the countries of the European Union. The production of polyvinyl chloride (PVC) continues. Preparations for PVC production from dichloroethane were completed in 2017.
- Application of a unified method of system management for health and safety, fire prevention and environmental protection in the UNIPETROL Group.
- Implementation of the initial stage of standardization of security requirements in the PKN Orlen capital company.
- Introduction of the ZERO electronic system for recording, reporting, managing and archiving emergencies and findings as an effective means of support for the process of continuous improvement in fire prevention and occupational health and safety.
- Implementation of BENZINA's environmental protection standards at 36 acquired petrol stations and their gradual reconstruction according to the most up-to-date criteria.
- Commencement of construction of a new boiler room at Petrochemie's steam cracker.
- Termination of trial operation of the WWTP Kralupy refinery and subsequent successful statutory approval.

3. Role of employees

UNIPETROL Group employees are considered the key agents of environmental, occupational health and safety and fire prevention activities. The individual companies have therefore implemented an effective training system for all employees. Training and education of employees are part of the established management system. It is subject to regular review, evaluation and completion under ISO 9001, 14001, 50001 and OHSAS 18001 standards.

All employees are actively and continuously engaged in the creation and protection of the environment. They are acquainted at regular remedial training sessions with the policies in the areas of environmental protection, health and safety and fire prevention, as well as the environmental impact of their activities and the objectives and programmes defined for their workplaces.

The correct training applies to both the Group's own employees and the employees of external companies operating at the industrial complexes. Liabilities related to environmental protection, fire prevention and health and safety are included in agreements with individual contractors.

The active role of employees is also supported by a newly introduced IDEA platform through which the Group's employees are encouraged to forward their own ideas to help meet and improve the UNIPETROL Group's goals, including those in the area of the HSEQ.

4. Communication with the public

The following tools are mainly used to communicate with the public:

- Social responsibility (CSR) principles applied by UNIPETROL Group companies in cities and their larger urban zones.
- Participation of UNIPETROL Group company management representatives at public meetings of the neighbouring municipal councils to provide information about the influence of the company on the surrounding environment.
- Open days for the public.
- Meetings with the mayors of the region to acquaint participants with all activities, including environmental protection as well as information about the occurrence of non-standard operating situations.
- Green line, internal communication sources (radio, print, intranet).
- Online connection of the Police of the Czech Republic and the Municipal Police in Litvínov and Most with the company's alarm system at Chempark Záluží.
- Emergency SMS messages via an information channel.
- Discussion of the Responsible Care programme implementation report with the representatives of trade unions and local and regional authorities.
- Public information provided via the Ecological Centre in Most and Kralupy nad Vltavou.
- Cross-border cooperation with Saxony through the Ecological Centre.
- Internet, Facebook.
- Interactive and educational programmes for primary and secondary school students, such as Chemistry and the Environment and the Path to the Secret of Oil.

5. Integrated management system policy

In May 2017, UNIPETROL's top management approved an Integrated Management System policy based on the core values of the UNIPETROL Group and the PKN Orlen Group called Responsibility – Development – People – Energy – Reliability. In line with the strategic focus of the Groups' companies, the policy includes commitments in the fields of occupational health and safety, environmental protection, quality, and now also commitments associated with energy management.

The Integrated Management System policy is published on the individual company websites.

6. Integrated management systems

Established management systems are an important factor in environmental protection, product quality, occupational health and safety, and fire and major accident prevention. UNIPETROL Group companies have established and certified Quality Management Systems (QMS) and Environmental Management (EMS) and Safety Management (HSMS) Systems as a guarantee of systemic access to the customer and its needs, product quality and service delivery, environmental protection and occupational health and safety. Some of the companies have had a certified Energy Management System (EnMS) in place since 2016 through which their commitment to optimizing energy use while meeting the legislative requirement of the Energy Management Act is declared.

The above management systems are certified according to international standards ISO 14001, OHSAS 18001, ISO 9001 and ISO 50001.

In the second and third quarters of 2017, a supervisory audit of management systems QMS, EMS, HSMS and EnMS took place at UNIPETROL, UNIPETROL RPA (including the BENZINA and RAFINÉRIE registered branches, Polymer Institute Brno), UNIPETROL DOPRAVA and PETROTRANS (note: at the Polymer Institute Brno only the EnMS). The Lloyd's Register Quality Assurance Certification Organization has verified adherence to the system standards. At the Polymer Institute Brno registered branch, a QMS supervisory audit was conducted in September 2017 by CQS (Association for Quality Systems Certification) and IQ Net (International Quality Certification Network).

In May 2017, PARAMO was inspected by Lloyd's Register Quality Assurance covering all three EMS, HSMS and QMS systems.

In June 2017, SPOLANA successfully underwent a re-certification audit of EnMS and a verification audit of QMS, EMS and HSMS by TÜV Rheinland Czech Republic s.r.o.

In 2018, the Group's companies are scheduled to adapt revised ISO 9001: 2015 (QMS) and ISO 14001: 2015 (EMS) standards. In the previous period, preparatory activities (differential analysis, processing of relevant documents, etc.) were performed in order to successfully complete the transition audit.

UNIPETROL RPA holds a certified sustainability system for producing fuels with bio comoponents (ISCC). The last audit to verify compliance with system requirements was conducted in January 2018 by SGS Germany.

UNIPETROL DOPRAVA has implemented a Safety and Quality Assessment System (SQAS) for logistics providers.

Certified / Verified Management Systems in the UNIPETROL Group in 2017

Company	ISO 9001	ISO 14001	OHSAS 18001	ISO 50001	SQAS	RC	ISCC
UNIPETROL	x	x	x	x		x	
UNIPETROL RPA (incl. BENZINA and REFINERY registered branches)	x	x	x	x		x	x
UNIPETROL RPA – PIB registered branch	x			x			
UNIPETROL DOPRAVA	x	x	x	x	x	x	
PARAMO	x	x	x				
SPOLANA	x	x	x	x		x	

Certificates are published on the individual company websites.

7. Responsible Care

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

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

In 2014, permission to use the logo of the Responsible Care programme was repeatedly given to UNIPETROL and UNIPETROL DOPRAVA. After resuming its membership in the ACI CR, UNIPETROL RPA defended its right to use the R.C. logo in 2017.

As PARAMO is no longer a member of the Association of Chemical Industry of the Czech Republic, it does not use the authorization, although it continues to meet the principles.

In 2015, SPOLANA defended the right to use the R.C. logo for the eighth time. In 2018, it will defend its right to use the logo for the ninth time.

8. Compliance with environmental protection regulations

A consistent attempt to comply with environmental protection regulations is also evidenced by the low number of instances of partial violations of environmental law requirements due to non-standard operating conditions. In 2017, only 1 sanction in the amount of 30 000.00 CZK was issued to UNIPETROL RPA for exceeding the "p" limit for the vanadium parameter in waste water in 2015.

9. Integrated prevention of pollution

Obligations of selected industrial companies in the area of integrated pollution prevention (IPPC) are regulated by the Act No. 76/2002, as amended. All UNIPETROL RPA production units, including the refineries in Litvínov and Kralupy nad Vltavou, fall within the scope of the IPPC Act and have valid integrated permits issued by the Regional Authorities of the Ústí Region and the Central Bohemia Region. These permits are continuously updated in relation to the requirements of the amended legal regulations and the fulfilment of their terms and conditions, the implementation of investment actions, changes to the technological facilities and changes to the substances used.

In 2017, a total of 18 integrated permit changes were issued in respect of UNIPETROL RPA equipment. Changes related to, for example, permitting operation of the new ethylene plant's power unit, permitting operation of the thermal oxidation unit at the new polyethylene plant, implementing requirements for leakage tests at the Litvínov refinery, approving the updated operating rules and emergency plans for individual plants, adjustments in the operating conditions of recirculating circuit water, monitoring pollutants discharged into the air, conditions for waste water discharge, and updating the description of individual plant facilities due to approved planned changes at the facilities.

During 2017, work began on preparing materials to review the binding conditions set in the integrated permit as required by the Conclusions on BAT for Joint Systems for Wastewater and Waste Gas Treatment in the Chemical Industry published in the previous year. UNIPETROL RPA participated in preparing the document on Best Available Techniques for the Chemical Cleaning Industry via the technical working group set up by the Ministry of Industry and Trade. Conclusions on BAT for the Large Combustion Sources Sector and the BAT Conclusions for the Organic Chemicals Sector were published in 2017. Revisions of binding conditions for installations falling under the scope of the BAT conclusions will be launched in 2018. Implementation of projects to meet the BAT conclusions for the mineral oil and gas refining sector continued in 2017. These projects will be completed in 2018. Compliance with BAT requirements at refineries must be reached by October 2018 at the latest.

All technologies operated by PARAMO have valid integrated permissions. Integrated permits issued by the Regional Authority of the Pardubice Region have been received at EC Pardubice for power engineering and asphalt, fuel and oil production. During 2017, the IP was updated twice (termination of operation of the hot contact furnace 8H01, decommissioning of the boiler room as a stationary combustion source in accordance with the previous National Plan of the Czech Republic, including the abolition of emission ceilings and the introduction of a new stationary source Expedition BA 95-Terminal and trial operation of a new flare stack). HS Kolín obtained one integrated permit issued by the Regional Authority of the Central Bohemian Region. In 2017, the IP was once updated as a result of permitting temporary storage of hazardous waste generated by distribution depots and due to adjustments to the Noise chapter. Permits vary continuously according to planned investments, shutdown of partial technologies and legislative changes.

Four integrated permits have been issued to SPOLANA to operate its facility. In 2017, the Regional Authority issued five changes to integrated permits. The most significant changes were terminating amalgam electrolysis operation and approving the new energy centre.

10. Overview of valid integrated operating permits

Production Unit	Integrated permit – (issuer)
Unipetrol RPA	
Production of polypropylene and polyethylene	Regional Authority of the Ústí Region
Steam cracker	Regional Authority of the Ústí Region
Production of ammonia	Regional Authority of the Ústí Region
Heating oil gasification plant	Regional Authority of the Ústí Region
Energy services unit	Regional Authority of the Ústí Region
Production of dicyclopentadiene and non-hydrogenated C9 fraction	Regional Authority of the Ústí Region
Litvínov refinery	Regional Authority of the Ústí Region
Kralupy nad Vltavou refinery	Regional Authority of the Central Bohemia Region
Paramo	
Refinery plant, Cost Centre Pardubice	Regional Authority of the Pardubice Region
Cost Centre Kolín	Regional Authority of the Central Bohemia Region
Spolana	
Energetic materials and toxic waste landfill	Regional Authority of the Central Bohemia Region
Production of chlorine and sodium amalgam by electrolysis	Regional Authority of the Central Bohemia Region
Production of polyvinyl chloride (PVC)	Regional Authority of the Central Bohemia Region
Production of caprolactam and sulfuric acid	Regional Authority of the Central Bohemia Region

11. Emissions to the environment

Emission of pollutants into the environment has stabilized over the past five years at the levels determined by substantial green investments made during the previous decade. The individual emissions to the environment are listed in the following chapters.

11.1 Discharge of waste water

At UNIPETROL RPA, the increase in 2017 in the amount of pollution in waste water compared with the years 2015 and 2016 is due to the re-launch of the Steam cracker and other units limited in the previous years due to an accident. The increase in pollution in terms of the COD parameter was due to shutdowns of some of the biological treatment plant technology due to investment and reconstruction work.

The Kralupy refinery waste water treatment plant underwent extensive reconstruction from 2013 to 2015 followed by two-year trial operation in 2016 to 2017. The plant started permanent operation on 1 January 2017. We note a reduction of polluting discharges in these years.

SPOLANA – the quantity of discharged pollution remains stable.

PARAMO – the rate of pollution via waste water has not changed in any significant way in the course of the previous years. A slight increase in pollution (HS Pardubice) in terms of the COD petroleum substance parameters occurred in connection with more intensive reclamation using the system of hydraulic groundwater protection (HOPV) (into sewage network). Pollution by waste water in Kolín (recipient Hluboký potok) remains stable.

The balance of indicators for waste water pollution for the Benzina registered branch cannot be indicated because the monitored parameters in the petrol station network are not consistent and cannot be interpreted in the overview. In the overall evaluation of individual petrol stations, none of the monitored parameters exceed the "m" value.

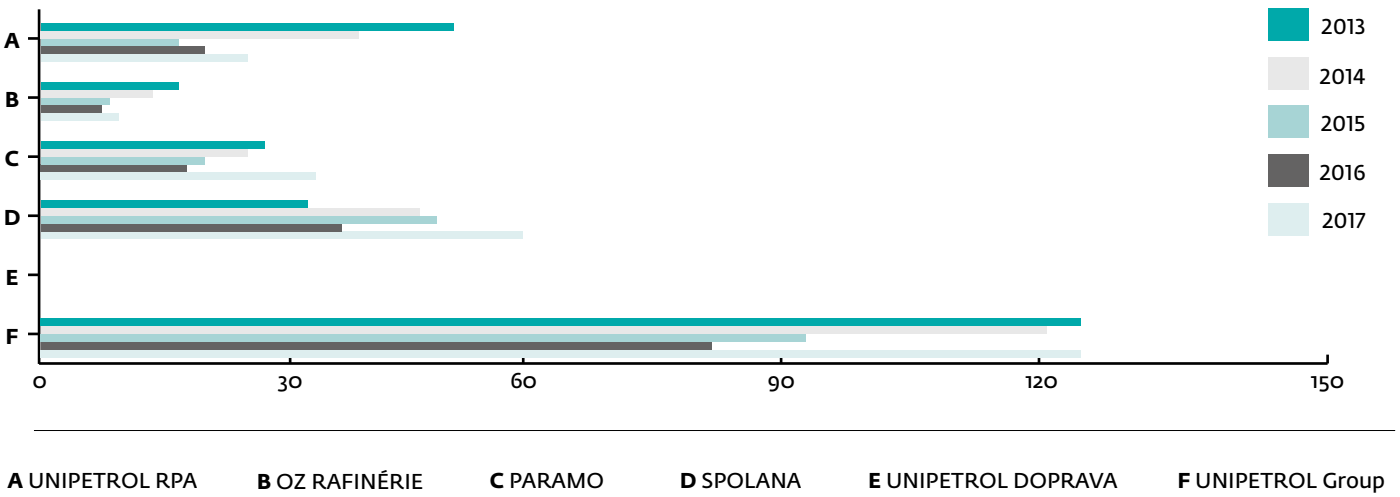
The decrease in pollution in the UNIPETROL Doprava company's Insoluble Substance Index is due to a decrease in the amount of cleaning equipment containing insoluble substances.

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	BOD	48	37	16	19	24
OZ RAFINÉRIE [3)]	BOD	16	13	8	7	9
PARAMO	BOD	26	24	19	17	32
SPOLANA	BOD	31	44	46	35	56
UNIPETROL DOPRAVA	BOD	0	0	0	0	0
UNIPETROL Group	BOD	121	117	89	78	121

1) BENZINA is not extensively monitored and representative data cannot be evaluated.
2) Only the Kralupy site. No direct discharge at Litvínov.
3) REFINERY registered branch.

Pollutants discharged via wastewater by the Group – BOD (t/year)



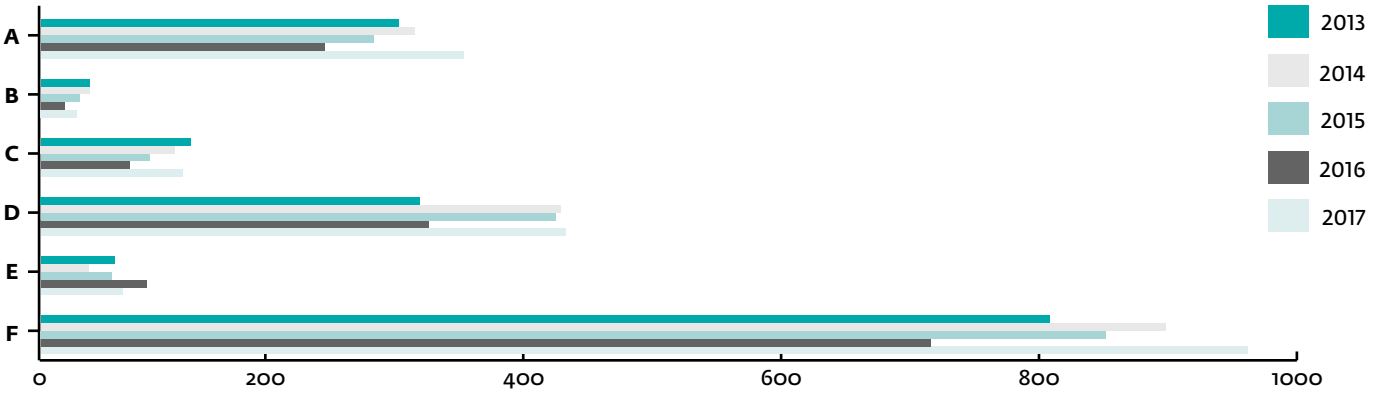
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	COD	277	290	258	220	328
OZ RAFINÉRIE [2) 3)]	COD	38	38	30	18	28
PARAMO	COD	116	104	84	69	110
SPOLANA	COD	294	403	399	301	407
UNIPETROL DOPRAVA	COD	57	37	55	82	63
UNIPETROL Group	COD	782	872	826	690	936

1) BENZINA is not extensively monitored and representative data cannot be evaluated.
2) Only the Kralupy site. No direct discharge at Litvínov.
3) REFINERY registered branch.

Pollutants discharged via wastewater by the Group – COD (t/year)



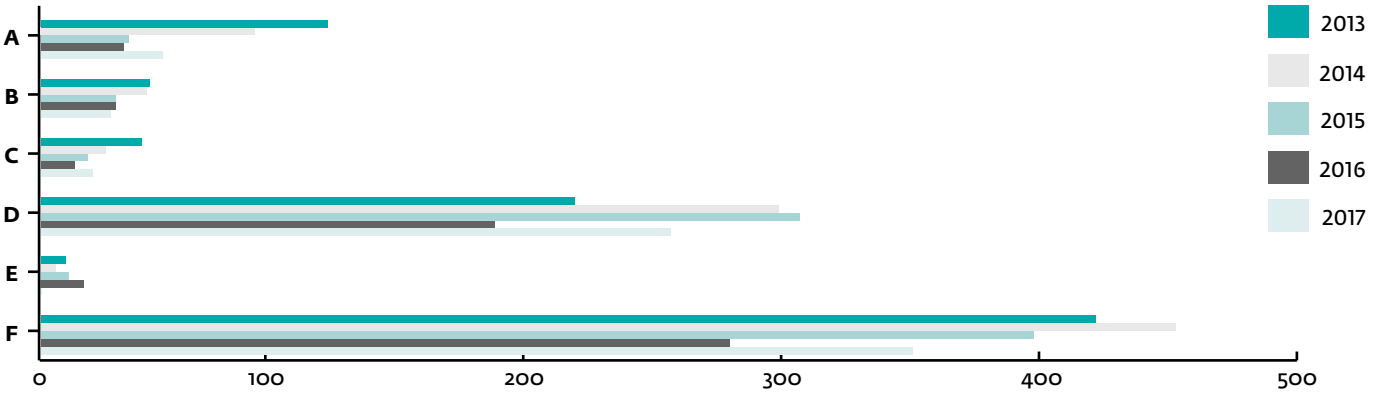
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	Undissolved substances	111	83	34	32	47
OZ RAFINÉRIE [2) 3)]	Undissolved substances	42	41	29	29	27
PARAMO	Undissolved substances	39	25	18	13	20
SPOLANA	Undissolved substances	207	286	294	176	244
UNIPETROL DOPRAVA	Undissolved substances	9.6	5.7	10.7	16.7	0.38
UNIPETROL Group	Undissolved substances	409	440	385	267	338

1) BENZINA is not extensively monitored and representative data cannot be evaluated.
2) Only the Kralupy site. No direct discharge at Litvínov.
3) REFINERY registered branch.

Pollutants discharged via wastewater by the Group – Undissolved substances (t/year)



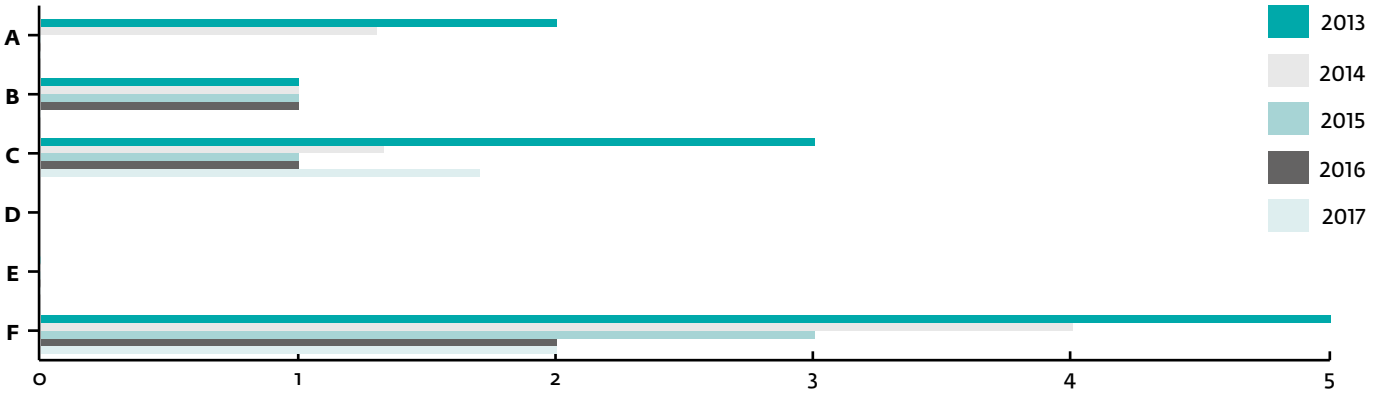
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	Oil substances	2	1.3	0	0	0
OZ RAFINÉRIE [2) 3)]	Oil substances	1	1	1	1	0
PARAMO	Oil substances	3	1.33	1	1	1.7
SPOLANA	Oil substances	-	-	-	-	-
UNIPETROL DOPRAVA	Oil substances	0	0	0	0	0
UNIPETROL Group	Oil substances	5	4	3	2	2

1) BENZINA is not extensively monitored and representative data cannot be evaluated.
2) Only the Kralupy site. No direct discharge at Litvínov.
3) REFINERY registered branch.

Pollutants discharged via wastewater by the Group – Oil substances (t/year)



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

11.2 Waste management

In UNIPETROL RPA, both the total amount of waste and hazardous waste has been reduced due to standard operation and consistent compliance with waste prevention. Increased production of hazardous waste in refineries in recent years is mainly due to increased use of the refinery's production units. Increased production of hazardous waste at PARAMO from 2013 to 2014 was due to the liquidation (sale) of larger volumes of waste slop oils. Currently, sales of waste oils have dropped to a less significant volume. At the same time, waste production generated by investment projects has also minimized.

The reduction of waste in UNIPETROL DOPRAVA is associated with the final closure of the rinse station in Neratovice and transfer of the rail maintenance section (track structure and subgrade and FM maintenance) to UNIPETROL RPA.

The increase in the production of hazardous waste in SPOLANA is associated with the shutdown of amalgam electrolysis.

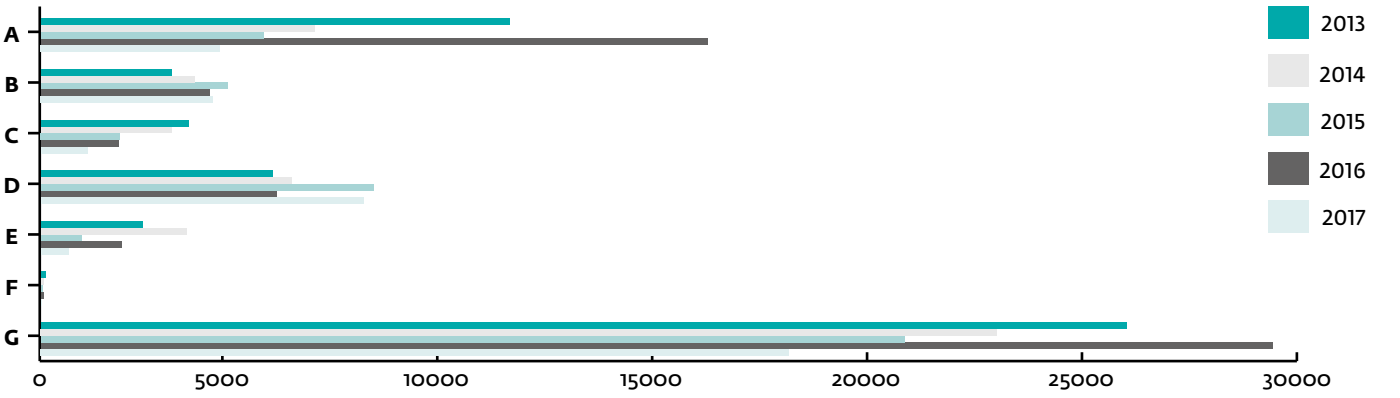
For the BENZINA registered branch, the balance does not include any waste generated by petrol stations, but only wastes from investment and other contracts, i.e. the producer of the remaining waste production is the lessee of the PS as an independent entrepreneur.

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

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	10904	6368	5177	15514	4165
OZ RAFINÉRIE [1)]	3043	3565	4336	3928	4003
PARAMO	3439	3038	1841	1796	1079
SPOLANA	5383	5822	7745	5489	7510
UNIPETROL DOPRAVA	2364	3394	953	1870	633
OZ BENZINA [2)]	116	57	40	52	16
UNIPETROL Group	25249	22244	20092	28648	17405

1) REFINERY registered branch.
2) BENZINA registered branch.

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



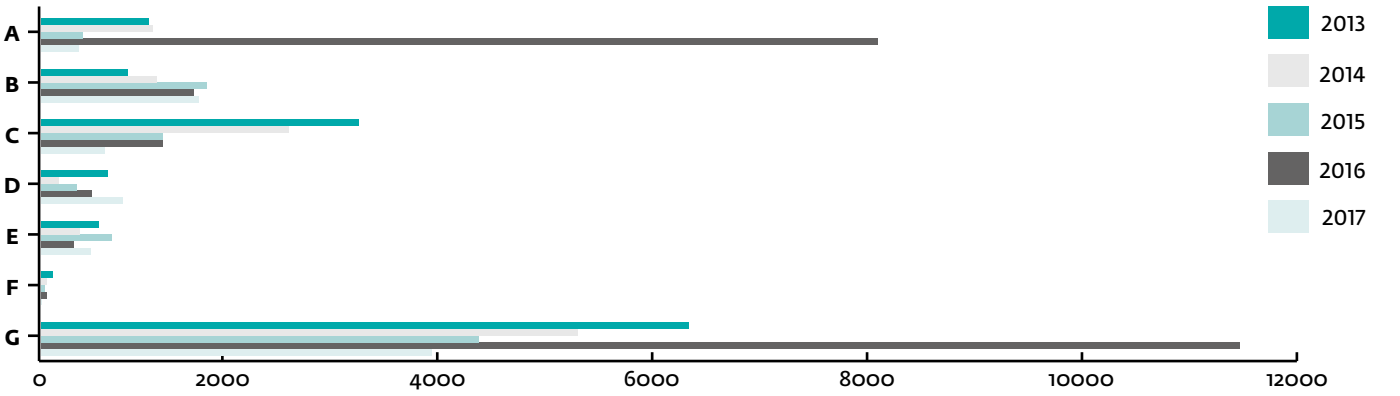
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** OZ BENZINA **G** UNIPETROL Group

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

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	1002	1038	389	7787	347
OZ RAFINÉRIE [1)]	806	1075	1540	1421	1470
PARAMO	2957	2307	1128	1128	591
SPOLANA	623	160	329	473	759
UNIPETROL DOPRAVA	532	361	654	300	463
OZ BENZINA [2)]	105	53	36	49	2
UNIPETROL Group	6026	4995	4076	11158	3633

1) REFINERY registered branch.
2) BENZINA registered branch.

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



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** OZ BENZINA **G** UNIPETROL Group

11.3 Air protection

The emissions of REFINERY registered branch in 2016 were lower than those from 2013 to 2015 due to production outages at both refineries. Slightly higher emissions in 2017 are due to more extensive use of both refineries.

In 2017, production at UNIPETROL RPA stabilised, resulting in slightly higher emissions compared with previous non-standard years, but SO_2 and solid pollutants dropped due to reduced emissions from the T700 heating plant.

In PARAMO, only natural gas was burned in the boilers of Cost center Pardubice and Cost center Kolín, which in the long term has led to lower sulfur dioxide, solid pollutant and volatile organic compound emissions. Low emission levels from combustion processes have been achieved despite an increase of oil processing at Cost center Kolín. This condition was supported by non-operation of some sources of air pollution at the Paliva plant and by limitation of total boiler plant power at Cost center Pardubice (only boiler K1 is in operation, boiler K2 serves as a backup source, and boiler K3 has been disconnected).

SO_2 have decreased at SPOLANA emissions due to less coal burning and more use of the gas boiler during production.

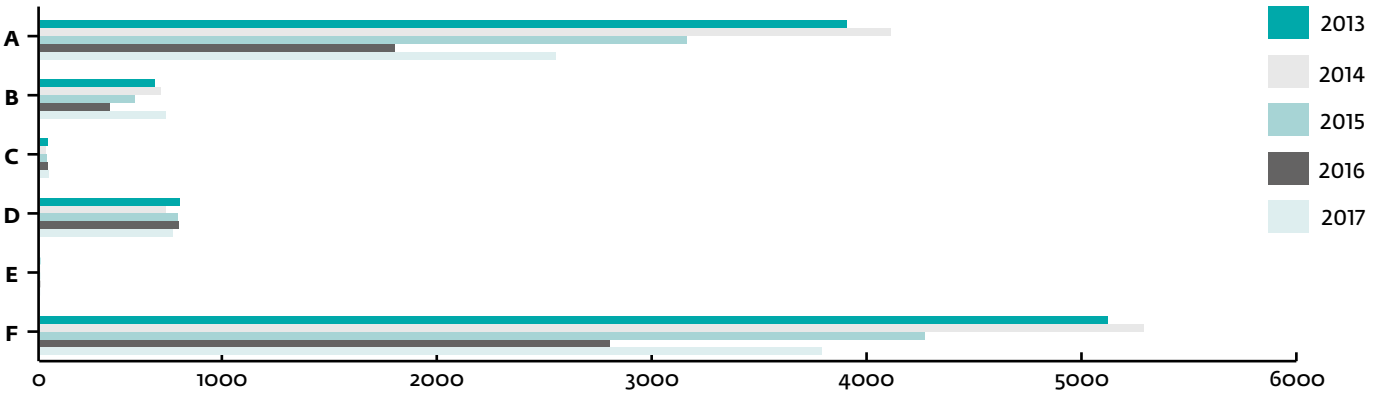
At UNIPETROL DOPRAVA the quantity of VOC used at the cleaning and steaming station for road tankers and rail tankers is around 1 tonne per year.

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	NO_x	3755,0	3958,0	3007,0	1648,0	2400,0
OZ RAFINÉRIE [1)]	NO_x	532,0	562,7	440,2	322,0	582,0
PARAMO	NO_x	33,0	27,0	28,0	35,7	39,0
SPOLANA	NO_x	649	586	642	644	616
UNIPETROL DOPRAVA	NO_x	0,0	0,0	0,0	0,0	0,0
UNIPETROL Group	NO_x	4969,0	5133,7	4117,2	2649,7	3637,0

1) REFINERY registered branch.

Pollution released into the air by the Group – NO_x (t/year)



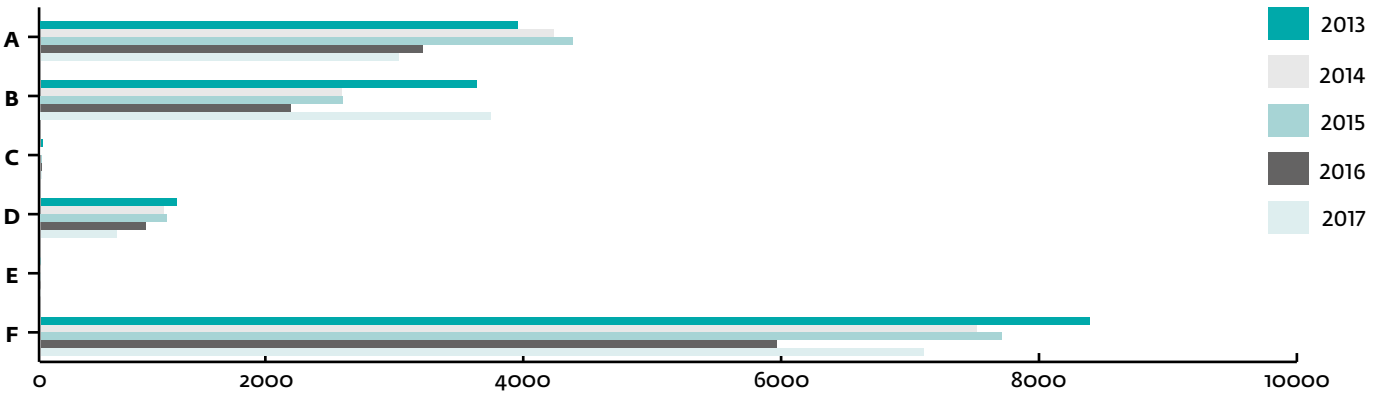
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	SO2	3700,0	3973,0	4124,0	2959,0	2771,0
OZ RAFINÉRIE [1)]	SO2	3375,0	2333,8	2342,4	1934,0	3490,0
PARAMO	SO2	9,0	0,4	3,0	2,7	1,3
SPOLANA	SO2	1049	948	978	811	585
UNIPETROL DOPRAVA	SO2	0,0	0,0	0,0	0,0	0,0
UNIPETROL Group	SO2	8133,0	7255,2	7447,4	5706,7	6847,3

1) REFINERY registered branch.

Pollution released into the air by the Group – SO_2 (t/year)



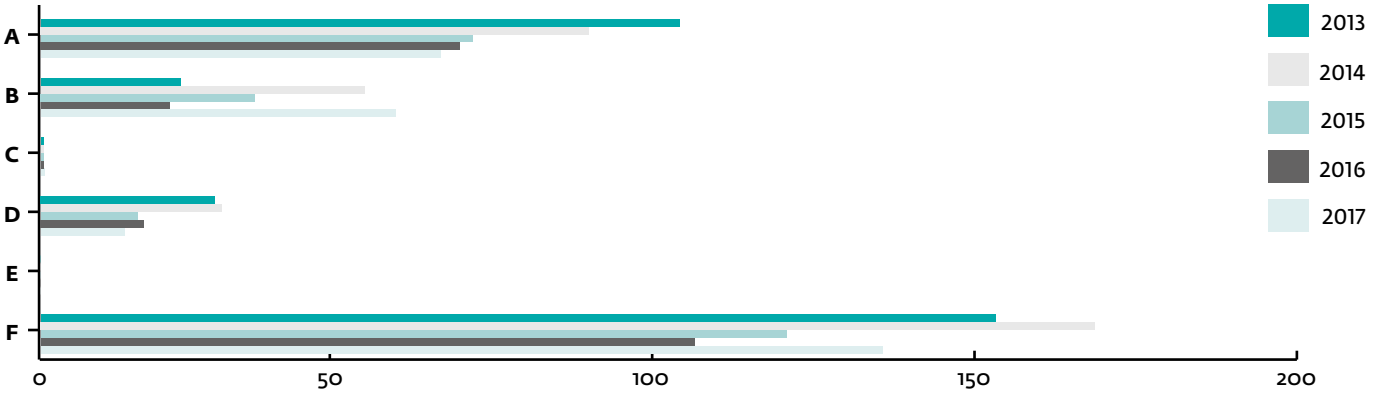
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	Solids	99,0	85,0	67,0	65,0	62,0
OZ RAFINÉRIE [1)]	Solids	21,6	50,2	33,2	20,0	55,0
PARAMO	Solids	0,4	0,4	0,4	0,4	0,5
SPOLANA	Solids	27	28	15	16	13
UNIPETROL DOPRAVA	Solids	0,0	0,0	0,0	0,0	0,0
UNIPETROL Group	Solids	148,0	163,5	115,7	101,4	130,5

1) REFINERY registered branch.

Pollution released into the air by the Group – Solids (t/year)



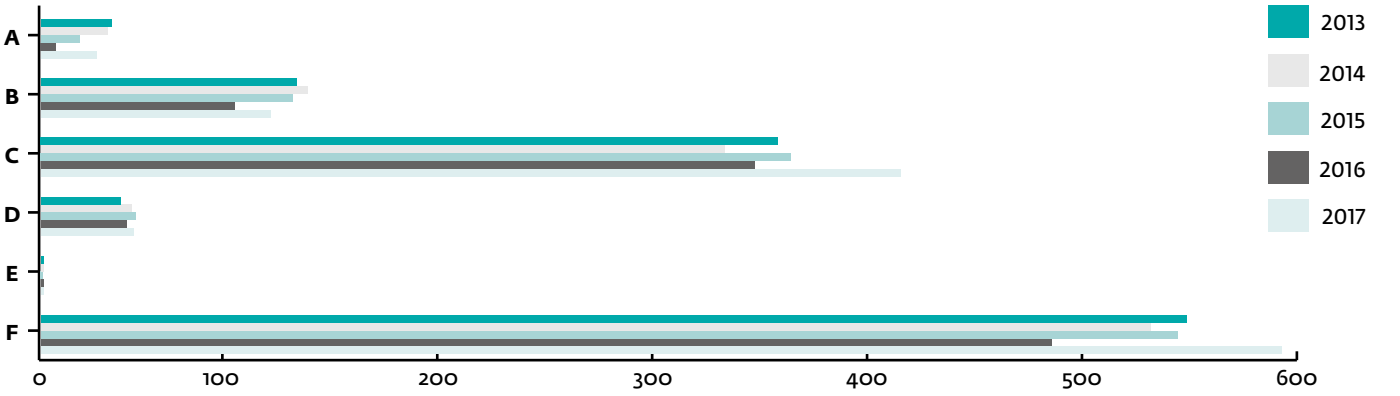
A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

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

Company	Indicator	2013	2014	2015	2016	2017
UNIPETROL RPA	VOC	33,0	31,0	18,0	7,0	26,0
OZ RAFINÉRIE [1)]	VOC	119,0	124,2	117,0	90,0	107,0
PARAMO	VOC[2)]	343,0	318,0	349,0	332,0	400,0
SPOLANA	VOC[2)]	37	42	44	40	43
UNIPETROL DOPRAVA	VOC	1,1	1,1	1,0	1,3	1,1
UNIPETROL Group	VOC	533,1	516,3	529,0	470,3	577,1

1) REFINERY registered branch.
2) 90% are fugitive emissions that are reported only on the basis of solvent purchases in a given calendar.

Pollution released into the air by the Group – VOC (t/year)



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** UNIPETROL Group

11.4 CO_2 emissions and Emission Allowances trading

Regulation of carbon dioxide emissions under the EU Emissions Trading Scheme (EU ETS).

In the third trading period 2013–2020, the number of monitored CO_2 sources of emissions significantly increased and the methods for calculating, monitoring and reporting changed. Calculation of the freely allocated emission allowances has also been through an important change.

Allowance allocation to companies of the UNIPETROL Group, PARAMO and SPOLANA under the 2013–2020 National Allocation Plan and actual CO_2 emissions in 2013–2017.

Allocation of allowances (thousand pcs) Real emissions (kt/year)	Unipetrol RPA	OZ Rafinérie [2)]	Paramo	Spolana	Skupina Unipetrol
Total allocation for 2013–2020 period	**10 159 [1)]**	**6494**	**445**	**1051**	**17 333**
2013: Actual CO_2 emissions	3062	772	47	232	4113
2014: Actual CO_2 emissions	3138	877	37	251	4303
2015: Actual CO_2 emissions	2841	888	36	239	4004
2016: Actual CO_2 emissions	2491	678	37	233	3439
2017: Actual CO_2 emissions	3324	954	42	207	4527

1) In the period 2013–2020, the number of greenhouse gas emissions included in the EU ETS has increased significantly. The allocation may change as a result of changes in device operation.
2) In 2017, UNIPETROL RPA and Česká rafinérská were merged, and from then on registered as OZ RAFINÉRIE (REFINERY registered branch).

Based on the emission calculations for 2017, the allocated annual quantity of allowances in UNIPETROL RPA, including REFINERY registered branch, covered approximately 38% of annual emissions. The UNIPETROL RPA freely allocated allowances for the year 2017 were partially reduced as a result of a lower use of the steam cracker in 2016. The 2017 emission allowance deficit will be covered by the next year's allocation of allowances, and the remaining deficit will be covered by purchasing allowances.

Because of the closure of all major stationary sources of air pollution still burning liquid fuels (fuel oil, diesel fuel), PARAMO has long been managing a significant surplus of allowances from previous allocation periods. The drop in CO_2 emissions in 2016 reported by Česká rafinérská was due to the limited operation of the Kralupy refinery and the planned stoppage of the Litvínov refinery. As a result of liquidation of the urea plant, the unallocated allowances of UNIPETROL RPA in 2018 will partially be reduced, but because of renewed operation and greater use of the steam cracker, the free allocation will again increase in 2018.

SPOLANA has reduced CO_2 emissions by lowering coal consumption.

11.5 Other greenhouse gases

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

12. Management of primary raw material and energy sources

To conserve primary raw material and energy sources, the UNIPETROL Group follows the principles of sustainable development and focuses its basic strategies on innovative approaches leading to the minimization of energy and material use and promotes continuous improvement in environmental performance and increasing energy efficiency. Companies of the Group in which a successful energy management system certification in accordance with ISO 50001 has been implemented have committed themselves to these principles under the framework of the Energy Policy.

UNIPETROL RPA continuously implements diverse investments and technological changes that have directly or indirectly resulted in reduced energy and raw materials consumption, reduced waste and wastewater production and recycling of by-products or raw materials etc. at the operator's facilities.

Many projects are under preparation for the petrochemical plants to optimize the quality of feedstocks for the steam cracker and thereby improve its operation. These activities impact the formation of corrosion on the equipment and improve their technical condition, which greatly enhances the efficiency of the operation.

Continuous development is taking place in the area of Advanced Process Control (APC). Advanced Process Control systems are being gradually implemented at the FCC Kralupy and Butadien Kralupy units. The APC system for the T700 heating plant is currently the most important project under preparation. The project will contribute to optimizing heat and power generation by improving the use of lignite, monitoring combustion efficiency etc.

UNIPETROL RPA is focused on reducing pipeline energy loss. The "Zero Tolerance" programme implemented from 2017 to 2019 has become a top priority. It principally involves extensive replacement of pipeline insulation and monitoring pipeline operation, removing leaks, and systematically verifying the functionality of condensate drainage. These activities are common to all parts of the UNIPETROL Group, i.e. Chempark Záluží, ACHV Kralupy, SPOLANA and PARAMO.

The future is benefitting from significant activities under which the strategies of energy sources operation is defined, including the size of these sources and observance of all legislative parameters. In 2017, the construction of a new boiler plant for the steam cracker began, which will significantly contribute to meeting all legislative requirements while also positively contributing to increased steam production efficiency during monomer production. A study is also underway to choose the new, optimal energy source and whether to replace or completely refurbish the T700.

At the RAFINÉRIE registered branch, an energy efficiency study of the production units was performed in 2017. It defined new measures aiming to reduce or optimize energy consumption. The inputs and measures will be further analysed and implemented as necessary, however, the study showed that energy management was already being handled very well.

Significant savings are achieved by better use of primary raw materials. The Group is focusing on an extensive modernization programme aimed at deeper oil processing in favour of so-called light products, especially fuels. In principle, this is an ongoing process – new analyses and projects are continually being designed and implemented. Currently, a pre-flash column project is underway, which will have a significant impact on energy consumption while allowing for more efficient crude oil processing. Also, a vacuum distillation project is being prepared to allow better use of the input crude oil.

The BENZINA registered branch is focusing its efforts on water, electricity and gas consumption at petrol stations. Regular monitoring of energy consumption was introduced in 2017. A project to install media consumption meters (electricity, water, gas) is planned in 2018 for all petrol stations under an "Energy Management" scheme. The aim of the project is to evaluate and optimize energy consumption at individual petrol stations via online monitoring and to compare and evaluate consumer opportunities based on these data. Electrical energy use is optimized at petrol stations via the introduction of low-energy appliances and technologies (LEDs).

At the Polymer Institute Brno registered branch, energy use has been reduced mainly by installing new equipment to replace existing technologies. In 2017, a bulk homogenizer and an IR dryer were installed, and a central process water cooler was installed to cool water in the production line's processes. Replacement of the tube extruder, foil blower, twin screw and single screw extruder is planned for 2018.

To improve energy efficiency, PARAMO has been implementing projects to reduce steam consumption used for product heating and pumping routes (using heat from its own steam generated at the incinerator for the "Asfalty" operation). Optimization of steam processing route distances (pipeline heat loss reduction) and installing thermal insulation in selected tanks is also being performed. Particular attention is being given to insulation under the "Zero Tolerance to Steam Leaks and Missing or Damaged Insulation" project.

Efforts to reduce electricity consumption culminated in the installation of a new boiler feeding pump at the HS Kolín boiler plant with a similar project being prepared for the Pardubice boiler plant.

At SPOLANA, revitalization of the backbone route of the 2.1 MPa steam pipeline was performed in 2017, thus achieving savings in input primary sources for the production of process heat. This will be followed in 2018–2019 by the revitalization of 2.1 MPa steam pipelines at the Caprolactam and PVC plants.

In the first half of 2019, SPOLANA will undergo a major change in the energy management structure associated with the shutdown of coal steam boilers, during which a new gas boiler plant will be built and only the 2.1 MPa steam distribution network optimized and reduced as needed at respective production plants. The supply of all heat to the SPOLANA commercial zone and to external customers will also be discontinued and replaced with another form of energy selected by the feasibility study in 2017.

The SPOLANA production area continuously monitors the consumption of primary energy sources, especially natural gas and water, and a reconstruction of sulfuric acid operation at the Kaprolaktam plant is being prepared for implemenation in the 2017–2021 period.

Efforts to improve energy intensive processes were also applied at the Kaprolaktam plant, which included reconstructing the lining of the sulfur burning furnace, installing a cooled cone in the drying kiln of the PVC plant and testing pressure reduction of the sulfur burning furnace steam boiler.

UNIPETROL DOPRAVA has placed particular emphasis onUNIPETROL DOPRAVA managing energy by optimizing fuel, electricity, processes and heating steam consumption.

One very important aspect of this has been modernizing the locomotive park, which is part of the company's strategic plan. In 2017, the company purchased seven new locomotives (diesel and electric). Three new locomotives (two diesel powered transmission types and one electric powered transmission type) have already been put into operation. Other locomotives will be delivered in 2018. In addition to the expected savings in fuel and electricity consumption, new locomotives will also help reduce emissions.

Other activities include modifying technological equipment and adjusting technological procedures. Technical modifications have been performed on the siding since 2016 (e.g., installation of photocells on the railyard siding's lighting towers). The plan for 2018 includes replacing energy saving lights at the UNIPETROL RPA Litvínov siding, changing the heating system for switches, installing heating control and thermal insulation for buildings etc. The time needed for steaming and cleaning railcars has been reduced and the plan also includes completion of insulation of the steam station's technology.

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

Year	2013	2014	2015	2016	2017
Unipetrol RPA	21,4	17,8	16,8	14,3	18,4
OZ Rafinérie Kralupy [1)]	2,7	3,0	2,9	2,3	2,0
Paramo	0,5	0,3	0,3	0,3	0,4
Spolana	12,1	19,2	18,5	16,3	15,8
UNIPETROL Group	36,6	40,3	38,5	33,2	36,7

1) REFINERY registered branch - Kralupy nad Vltavou.

Stabilized energy consumption in the UNIPETROL Group is accompanied by a significant growth in production volumes. The development of energy efficiency in production processes can therefore be better seen in the following tables of specific energy consumption. Efficiency is expressed by the energy consumption coefficient calculated as tonnes of oil equivalent (TOE) related to tonnes of production per year:

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

Year	2013	2014	2015	2016	2017
Unipetrol RPA	8,8	8,4	8,6	7,9	11,8
OZ Rafinérie [1)]	16,1	16,8	16,7	14,0	17,3
Paramo	1,0	0,9	0,8	0,8	0,5
Spolana	3,5	4,1	3,7	3,2	3,4
UNIPETROL Group	29,4	30,2	29,8	25,9	33,0

1) REFINERY registered branch.

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

Year	2013	2014	2015	2016	2017
Unipetrol RPA	0,166	0,145	0,189	0,291	0,219
OZ Rafinérie Litvínov [1)]	0,047	0,043	0,047	0,050	0,045
OZ Rafinérie Kralupy [2)]	0,060	0,055	0,054	0,062	0,050
Paramo HS Pardubice	0,202	0,124	0,133	0,147	0,135
Paramo HS Kolín	0,227	0,184	0,225	0,240	0,290
Spolana	0,181	0,176	0,165	0,156	0,147

1) REFINERY registered branch - Litvínov.
2) REFINERY registered branch - Kralupy nad Vltavou.

13. Environmental investments

Environmental investments are defined as capital investment projects caused directly by the requirements of environmental protection legislation and closely related to implementing integrated pollution prevention. Environmental investments include other investment projects with a significant and positive effect on the environment.

In 2017, the Group implemented the following environmental investments:

OZ RAFINÉRIE (REFINERY registered branch)

OZ RAFINÉRIE implemented environmental protection investment projects valued at CZK 63.96 million, including:

- Reconstruction of the Litvínov refinery sewage network. Design and preparation of a project for a compact block sewage system at the new Litvínov refinery and production units for preparing Petrochemie's raw materials has commenced.
- Reconstruction of the sloping system at the new Litvínov refinery.
- Projects implemented in 2016 to ensure compliance with the best available techniques (BAT). Continuous emission measurements will be conducted on selected sources at both refineries. A DeSOx additive dosing will be installed on a fluid catalytic cracker unit at the Kralupy refinery.
- Commencement of a project to repair the storage yard for storage tanks at the Kralupy refinery.
- A project to exchange continuous emission analysers at the liquid sulfur production unit at the Litvínov refinery.

UNIPETROL RPA

UNIPETROL RPA implemented environmental protection investment projects valued at CZK 124.4 million, including:

- Preparation to install DeSOx technology at the T700 heating plant.
- Installation of DeNOx on the first three boilers in the T700.
- Reconstruction of the sewage system, including shafts at the steam cracker.
- Water management of the steam cracker's handling surfaces.
- Completion of construction of equipment to clean the mechanical final-cleaning station's tanks.
- Preparation of project documentation for the construction of a new power unit for the steam cracker, including EIA.
- Measures to meet the vanadium limit in waste water.

A number of other measures with a positive environmental impact were implemented under plant equipment maintenance costs.

PARAMO

PARAMO implemented environmental protection investment projects valued at CZK 0.433 million, including:

- Installation of a ground-level flare. Work on a safety element of the BA warehouse (Fuel operation) is currently being completed.
- Energy audit 2017 (Cost center Pardubice, Cost center Kolín).

SPOLANA

SPOLANA implemented environmental protection investment projects valued at CZK 8.2 million, including:

- Reduction of trichlorethylene emissions.
- Improvement of aeration at the sewage treatment plant.
- Waste water monitoring and instrumentation.

BENZINA

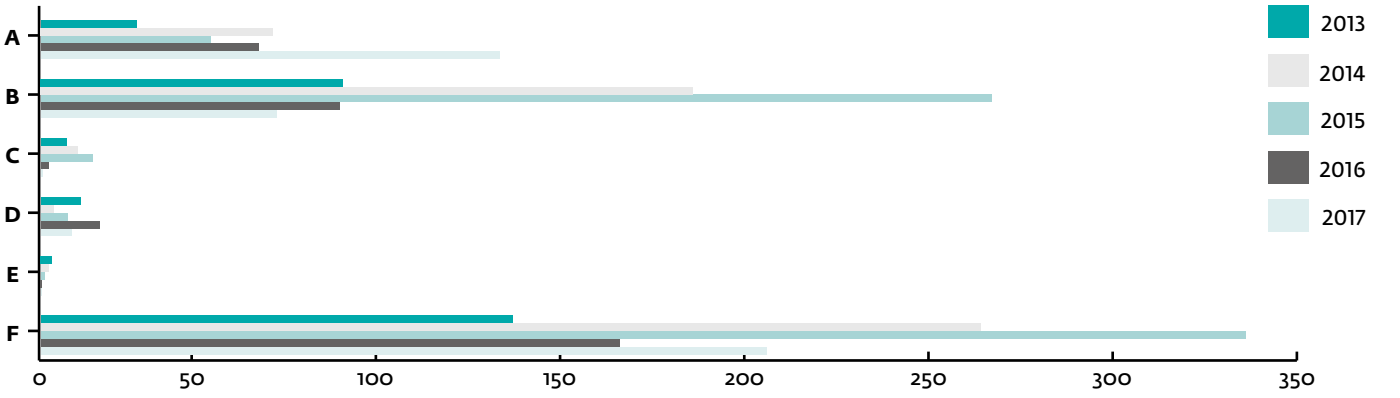
BENZINA implemented environmental protection investment projects valued at CZK 97 thousand, including a water treatment plant at the Břeclav PS (Petrol Station).

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

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	26	63	46	59	124.4
OZ RAFINÉRIE [1)]	82	177	258	81	64
PARAMO	7	10	14	2	0.433
SPOLANA	10.8	3.5	7.2	15.9	8.2
BENZINA	3	2	1	0.3	0.097
UNIPETROL Group	128	255	327	157	197

1) REFINERY registered branch.

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



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** BENZINA **F** UNIPETROL Group

14. Environmental operating costs

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

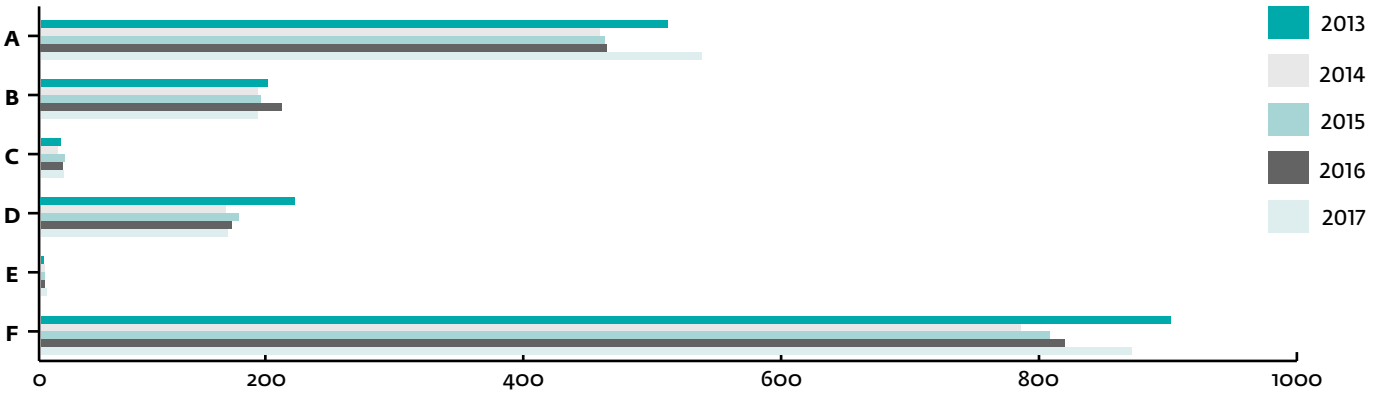
Newly installed modern technologies with a high degree of raw material conversion, reduced waste amounts and high energy efficiency have resulted in an overall reduction in environmental operating costs compared with the previous decade. The total environmental operating costs have been more or less stable in the last decade. The development trend of environmental operating costs in 2013–2017 is shown in the following table:

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

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	486	433	437	439	512
OZ RAFINÉRIE [1)]	176	168	170	187	168
PARAMO	15	13	18	17	17.4
SPOLANA	197	143	153	148	145
BENZINA	2	3	3	3	4
UNIPETROL Group	876	760	782	794	846

1) REFINERY registered branch.

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



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** BENZINA **F** UNIPETROL Group

15. Total costs of environmental protection

The total environmental protection costs for the UNIPETROL Group include environmental investment costs, environmental protection operating costs, costs for repairing environmental damage, and also expenses for air pollution, wastewater discharge, waste disposal in landfill, provisioning for landfill reclamation, and compensation for damage to forests by pollution. Development of expenses and payments for environmental pollution and the total costs of environmental protection in the years 2013–2017 are shown in the following table.

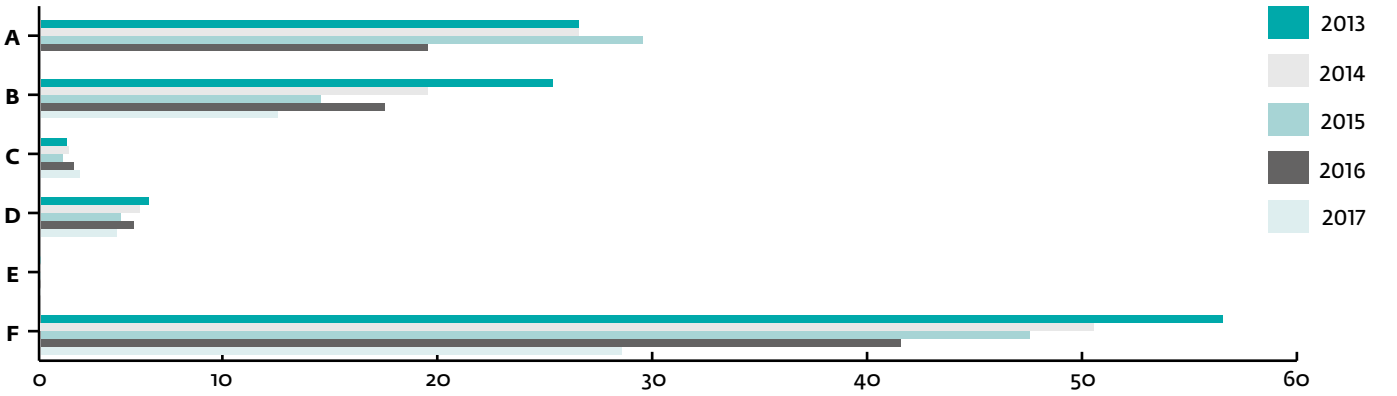
Fees and payments for environmental pollution in the Group (CZK mil. per year)

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	25	25	28	18	10.9*
OZ RAFINÉRIE [1)]	23.8	18	13	16	11
PARAMO	1.2	1.3	1	1.5	1.8
SPOLANA	5	4.6	3.7	4.3	3.5
BENZINA	0	0	0	0	0
UNIPETROL Group	55	49	46	40	27

*The actual balance of payments when taking into account use of the New ash dumps reserve in the amount of CZK -19 486 million amounts to CZK -8.6 million.

1) REFINERY registered branch.

Fees and payments for environmental pollution in the Group (CZK mil. per year)



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** BENZINA **F** UNIPETROL Group

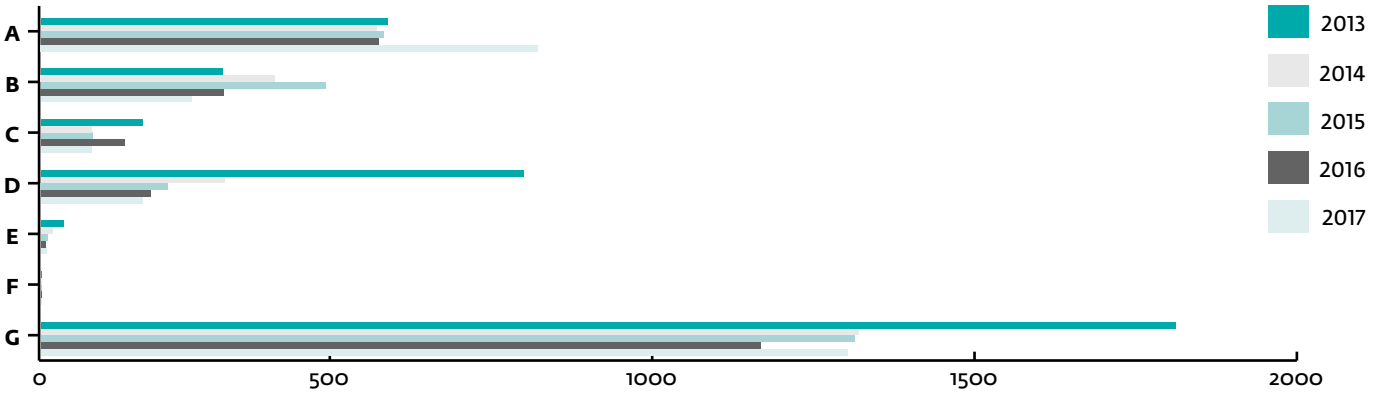
The total costs of environmental protection in 2016 amounted to CZK 1.2 billion.

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

Year	2013	2014	2015	2016	2017
UNIPETROL RPA	537	521	532	524	771
OZ RAFINÉRIE [1)]	281	363	442	284	233
PARAMO	158	79	80	129	79
SPOLANA	748	285	197	170	158
BENZINA	35	18	10	7	9
UNIPETROL	1.3	1.3	1.3	1.3	1.3
UNIPETROL Group	1760	1268	1262	1116	1251

1) REFINERY registered branch

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



A UNIPETROL RPA **B** OZ RAFINÉRIE **C** PARAMO **D** SPOLANA **E** UNIPETROL DOPRAVA **F** OZ BENZINA **G** UNIPETROL Group

16. Programme for remediating old environmental burdens

Based on the privatization-related decision of the Government of the Czech Republic, UNIPETROL Group companies entered into the following agreements to solve ecological commitments sustained before privatization (Ecological Agreement):

1) Ecological Agreement No. 14/94, as amended by amendment No. 3 on 25 January 2005, entered into by UNIPETROL
2) Ecological Agreement No. 32/94, as amended by amendment No. 1 on 4 July 2001, entered into by UNIPETROL
3) Ecological Agreement No. 39/94, as amended by amendment No. 2 on 4 July 2001, entered into by PARAMO
4) Ecological Agreement No. 58/94, as amended by amendment No. 4 on 27 June 2016, entered into by PARAMO
5) Ecological Agreement No. 184/97, as amended by amendment No. 7 on 18 January 2007, entered into by BENZINA
6) Ecological Agreement No. 33/94, as amended by amendment No. 4 on 8 April 2009, entered into by SPOLANA

Remedial works at different stages of completion are being performed under these Ecological Agreements. The current overview is shown in the table below:

Litvínov

Location	Current status	Next stage
Liquid sludge landfill Růžodol	Post-remediation monitoring after oil sludge has been drawn	Remediation project documentation for contractor selection
The works complex	Contamination clouds No. 1, 2c, 3, 6 and 10 remediated and handed over. Remedial works have not been fully completed on the contamination clouds No. 2, 4, 5, 7, 9 and 11	Remediation completed. Start of post-remediation monitoring
Uhlodehta landfill	Remediation project documentation	Updated risk analysis
Solid industrial waste landfill	Remediation project documentation	Updated risk analysis
Lime sludge landfill II.	Remediation project documentation	Updated risk analysis
Lime sludge landfill at the siding	Remediation project documentation	Updated risk analysis
Ash dump south foreland	Partially re-cultivated, preparing remediation of areas not yet remediated	Updated risk analysis
Fly-ash dump	Partially re-cultivated, preparing remediation of areas not yet remediated	Updated risk analysis
Contaminated cloud No. 13	Protective remediation pumping performed at the acquirer's expense (UNIPETROL, a.s.)	Remediation feasibility study
'Nová voda střed' reservoir pumping	Protective remediation pumping currently in progress	Remediation project documentation for contractor selection
Růžodol drain pumping Contaminated cloud No.12	Protective remediation pumping currently in progress	Remediation project documentation for contractor selection

Kralupy nad Vltavou

Location	Current status	Next stage
The works complex	Updated risk analysis URA (AAR)	Post-survey + Remediation project documentation
Nelahozeves landfill	Remediation project documentation realized	Remediation of pollution
The works complex – contamination cloud E	Remediation project documentation for contractor selection	Remediation of pollution
'Gudrony' (acid tar waste from crude oil refining)	Feasibility study	Remediation of pollution

BENZINA (Distribution Warehouses (DW) and main PS (Petrol Stations))

Location	Current status	Next stage
Kostelec nad Černými lesy PS	Remediation project documentation for contractor selection	Remediation of pollution
Ostrava-Muglinov PS	Final survey and processing of remediation project currently under way	Remediation of pollution
Točník DW	Final survey + Remediation project documentation for contractor selection	Remediation of pollution
Liberec-Rochlice DW	Final survey + Remediation project documentation for contractor selection	Protective remediation pumping Remediation of pollution

Šumperk DW	Final survey and processing of remediation project currently under way	Remediation of pollution
Bartošovice DW	Final survey + Remediation project documentation for contractor selection	Remediation of pollution
Pardubice Chrudimská PS	Remediation of pollution	Post-remediation monitoring
Přelouč PS	Realization Project documentation of remediation	Remediation of pollution
Nový Bohumín DW	Realization Project documentation of remediation	Remediation of pollution

PARAMO - Pardubice

Location	Current status	Next stage
Časy	Protective remediation pumping and monitoring	Remediation project documentation for contractor selection
Hlavečník	Protective pumping of precipitation water	Protective pumping of precipitation water
Surroundings of the main works – LIDL	Updated risk analysis	Contract ended
Surroundings of the main works surroundings – U Trojice	Remedial pumping of bores and drains + monitoring	Continuation of remediation pumping and monitoring
The main works – stage 1A	Pre-remediation Eng. and Geo (IG) and Hydrological (HG) survey, dismantling of technological equipment	Remediation of pollution
Nová Ves	Updated risk analysis	Post-remediation monitoring

PARAMO - Kolín

Location	Current status	Next stage
The works complex and sludge lagoons	Processing of final remediation report	Updated risk analysis

SPOLANA

Location	Current status	Next stage
Toxic waste landfill remediation	Remediation completed	Post-remediation monitoring
Remediation of objects contaminated with dioxins	Remediation completed	Remediation completed
Remediation of old amalgam electrolysis	Remediation completed	Post-remediation monitoring
Ground water remediation at Petrochemie	Remediation project documentation for contractor selection	Remediation of pollution
'Starý závod' (Old works) Ground water remediation	Feasibility study	Remediation project documentation for contractor selection
Remediation of mercury contamination of the Labe riverbanks	Remediation project documentation for contractor selection	Remediation of pollution

Allocation of allowances to UNIPETROL Group companies according to the National Allocation Plan (mil. CZK incl. VAT) as of 31 December 2017

	UNIPETROL Litvínov	UNIPETROL Kralupy	PARAMO Kolín	PARAMO Pardubice	BENZINA	SPOLANA	Group total
Financial guarantee by the MoF	6012.0	4243.9	1906.6	1241.5	1349.2	8159.1	**22 912.3**
Costs paid by the MoF in 2017	69.9	0.2	38.2	21.2	4.2	1.7	**135.4**
Costs paid by the MoF since the works started	4255.7	51.8	1897.7	545.1	485.0	5596.6	**12 831.9**
Expected cost of future works	2513.2	788.6	2.9	2781.5	998.2	1739.5	**8823.9**
Total (estimated) remedial costs	**6768.9**	**840.4**	**1900.6**	**3326.6**	**1483.2**	**7336.1**	**21 655.8**

17. Chemical safety

All the companies of the Group 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 that exhibit hazardous properties, they process safety data sheets which are then provided free of charge to all purchasers. At UNIPETROL RPA and in accordance with the REACH regulation, safety data sheets of manufactured and purchased hazardous chemicals and mixtures are available to all employees via the intranet computer network.

The Group continuously observes communications in the chain of supply and demand, which is the basis for implementing measures to protect employee health and the environment when using hazardous chemicals individually or contained as mixtures. It applies and monitors any amendments due to updated processes associated with registering and classifying chemical substances and updates these changes in its safety data sheets.

All the companies continuously monitor the handling of chemical substances and mixtures from raw materials up to the finished products and ensure compliance with applicable laws, including internal and external testing and subsequent issue of legal statements for specific application of selected products involving, for example, contact with food and drinking water, medical use etc. The companies have customer services to provide detailed information about the characteristics of the products in relation to their specific use.

The companies of the Group are subject to international inspection by the UN intergovernmental organisation (OPCW) monitoring observance of the "Chemical Weapons Convention". All previous checks carried out by state authorities and international inspections on the companies of the Group have shown thorough fulfilment of the Convention.

In accordance with the current legislation, PARAMO implemented the necessary registration of substances and isolated intermediates in due course. In 2017, in cooperation with the CONCAWE consortium, active registered substances and intermediates were updated according to REACH, including a complete update of the dossier for "Lubricating oils" substances for which PARAMO is the main registrant in the EU market.

At the end of 2017, PARAMO was inspected by the Hradec Králové Regional Czech Environmental Inspectorate (ČIŽP OI HK) and the Regional Public Health Station (KHS) focusing on the fulfilment of obligations stated in the exposure scenarios and the obligations under the Chemical Substances Act and REACH. The inspection did not reveal any legislative errors.

To fulfil the requirements of REACH, the companies continuously update registration dossiers and ensure that their software application IUCLID used to process the technical documentation for both registered and notified substances is in line with the latest version published on the ECHA website.

18. Occupational safety and health at work and fire prevention

The UNIPETROL Group considers occupational safety and health at work and fire prevention as one of its priority policies.

In 2017, systemic steps were taken to implement a uniform approach to integrated occupational health and safety management and fire prevention within the UNIPETROL Group. The result is a standardized approach to newly introduced processes and a plan for the gradual unification of safety requirements applied to individual companies in the group.
An integral part of these steps is the standardizing requirements across the entire PKN Orlen Group. In 2017, a uniform system of requirements associated with excavation work, emergency event investigations, work at heights and confined spaces was applied.

A unified system of monitoring selected performance indicators was set up within the Group, which includes target values for 2017. New monitoring of selected performance indicators in the field of process safety was included (according to ANSI/API Recommended Practices 754 Performance Indicators for Process Safety for the Refinery and Petrochemical Industry). In 2017, only four events were classified as Tier 1 Process Safety Events (PSE Tier 1) across the Group. The UNIPETROL Group met target values. The resulting values are listed in the summary table below.

UNIPETROL Group	2017 Target	Resultant value
TRR: Number of accidents with consequent absence per million hours worked	1.8	1.35
PSE – Tier I: Number of process events per million hours worked	1.0	0.29

19. Prevention and personal protective equipment

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

20. The quality of the work environment

According to work categories, working conditions at UNIPETROL Group companies are regularly checked by measuring the environmental factors of work, especially the exposure of employees to noise, chemicals and dust.

21. Health care and prevention

UNIPETROL Group companies have concluded agreements with physicians on the provision of occupational health services. Preventive medical examinations are conducted in compliance with the relevant laws and internal regulations.

22. Prevention of major accidents

The companies belonging to the Group pay much attention to preventing major accidents in the long term. The basis for preventing accidents is the reliable and trouble-free operation of production facilities. The facilities are designed, operated, inspected and maintained in accordance with Czech legislation and internal regulations. Some of the regulations contain requirements beyond legislation and are based on the best practices of the companies in the Group.

Production plants are equipped with control systems that signal deviations from standard operating parameters. Some plants performing hazardous operations are equipped with automatic unit shutdown systems in the event of specified operating parameters being exceeded. Depending on the type of hazardous substances, the plants are equipped with modern detection systems (detection of flames, smoke, or hazardous substance releases) connected to signalling panels in the control rooms and operation centres of the fire rescue service. Stationary and semi-stationary extinguishing systems and fire monitors are installed at the plants.

Regular internal audits of security and accident risk assessment take place in all companies of the Group. In addition, state technical supervisory bodies perform regular external audits and inspections. These bodies include the CEI, OIP, FRS and RHS professional organizations, insurance brokers, insurers and foreign reinsurers. The recommendations and findings of these audits are incorporated into the respective implementation plans.

An important component of preventing serious accidents is the regular training of employees. The functionality of the serious accident prevention system is tested throughout the year via simulations of both emergency and crisis situations. Testing is performed by operation plant employees in cooperation with its own and external operational divisions. They include emergency exercises (at individual plants + comprehensive emergency exercises performed in cooperation with the companies managing the industrial premises or businesses in their neighbourhood). The emergency exercises in UNIPETROL Group companies are carried out according to a defined plan. The exercises serve as practical training of employees to sufficiently respond to possible disasters. Their aim is also to verify the strength of emergency plans and procedures and improve the knowledge of all participants. If an exercise reveals deficiencies, sufficient corrective measures are adopted from evaluation of the exercise, including deadlines for removing these deficiencies and designating personnel responsible for implementing measures.

Risk management of major accidents includes liability insurance in accordance with the Act No. 224/2015 Coll., on the prevention of major accidents, as amended.

The safety level of the Group's companies is significantly influenced by new investment into production facilities whose projects address possible operational risks through generally accepted methods of major accident risk assessment. Each new facility is equipped with the most modern safety systems meeting the legal requirements of the Czech Republic and the European Union.

Production Group companies have their own fire departments with top-level equipment and training. Fire departments are capable of highly specialized intervention in accidents associated with the release of hazardous substances. REFINERY registered branch employs the services of the UNIPETROL RPA (Litvínov) and Synthos (Kralupy nad Vltavou) fire departments.

Most manufacturing companies in the Group have the "B" classification, which means they are subject to the strictest controls defined in the Act 224/2015 Coll., on the prevention of major accidents, as amended, in the handling of selected hazardous chemical substances/mixtures.

Overview of classification of companies into groups according to the Act No. 224/2015, as amended, and the condition identified in the Safety Report of 31 December 2017

Company	Object	Groups	Safety report
UNIPETROL RPA	UNIPETROL RPA	B	The SR update is currently undergoing approval / Regional Authority of the Ústí Region
	REFINERY registered branch Litvínov Production section (Litvínov refinery)	B	The SR update is undergoing approval / Regional Authority of the Ústí Region
	REFINERY registered branch Kralupy Production section (Kralupy refinery)	B	The SR update is undergoing approval / Regional Authority of the Central Bohemia Region
	BENZINA registered branch	–	Not subject to the Act No. 224/2015. Report on non-inclusion according to the law was updated and submitted to the relevant Regional Authorities
UNIPETROL DOPRAVA	Operating department, Pardubice facility, Semtín, Railway facility Pardubice	B	The SR update is undergoing approval / Regional Authority of the Pardubice Region
	Operating department, Pardubice facility, Semtín, Railway siding Semtín	B	The SR update is undergoing approval / Regional Authority of the Pardubice Region
	Operating department, Railway siding Litvínov	B	The SR update is undergoing approval / Regional Authority of the Ústí Region
	Operating department, Kralupy facility, Neratovice, Railway facility Kralupy	B	The SR update is undergoing approval / Regional Authority of entral Bohemia Region
	Operating department, Kralupy facility, Neratovice, Railway facility Neratovice	B	The SR update is undergoing approval / Regional Authority of Central Bohemia Region
PARAMO	Pardubice Cost Centre	B	The SR update is undergoing approval / Regional Authority of the Pardubice Region
	Kolín Cost Centre	-	Not subject to the Act No. 224/2015. Report on non-inclusion according to the Act was updated and submitted to the Regional Authority
SPOLANA	SPOLANA	B	The SR update is undergoing approval / Regional Authority of Central Bohemia Region (the submission deadline was extended to 31 December 2017, submitted on 20 December 2017)

23. Serious accidents

In 2017, a serious accident occurred in two objects of the UNIPETROL Group subject to Act No. 224/2015 Coll., on the prevention of major accidents, as amended, classified by the Ministry of the Environment as a major accident. UNIPETROL does not endorse this classification, as it is based on a completely non-transparent definition of what constitutes a major accident, as set out in the aforementioned Act. The UNIPETROL Group took several steps to obtain a clear definition of the concept of a major accident and to simplify the decision-making process of both operators and competent authorities. So far, these steps have not produced the expected outcome.

Other operating accidents that occurred during the year were managed in-house or by the company's fire departments. They were adequately responded to in order to prevent their recurrence. The effects of small operating accidents did not extend beyond the territory of the Group's companies.

24. Transport Information and Emergency System – TRINS

The Transport Information and Emergency System (TRINS) is a system to assist with accidents associated with transporting hazardous substances. TRINS was created by the Association of Chemical Industry of the Czech Republic as part of the "Responsible Care" programme in 1996. Under the agreement between the Association and the Headquarters of the Fire and Rescue Service, it was included as one of the support schemes in the Integrated Rescue System. TRINS is similar to the British system CHEMSAFE, for example, or the German TUIS, which served as the model for building TRINS. Similar systems have also been implemented in the Slovak Republic (DINS) and Hungary (VERIK) and have been applied by many EU countries.

TRINS centres (in cooperation with the Fire and Rescue Services of the Czech Republic) provide urgent consultations concerning information about chemical substances and products, their safe transportation and storage, and practical experience with the handling and disposal of hazardous materials and emergency situations associated with their transport. TRINS centres also provide practical assistance in liquidation of emergency situations, such as removal of subsequent environmental damage.

Currently, 21 TRINS regional centres are in the Czech Republic. The centres are provided by 34 companies operating in the chemical industry. UNIPETROL Group companies are founding members of TRINS. UNIPETROL RPA acts as the national coordination centre.

WWW.UNIPETROL.CZ