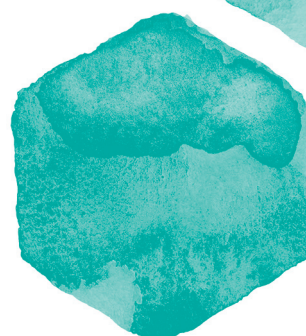
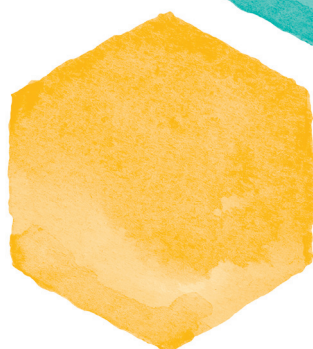


# Joint report on occupational health, safety, and environmental protection

**Unipetrol  
Group  
2016**



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# Fundamental data on the management of Unipetrol Group in 2016 - consolidated data

	2015	2016
<b>Structure of assets and liabilities (mil. CZK)</b>		
Total assets	54,499	<b>68,652</b>
Fixed assets	22,575	<b>32,270</b>
Current assets	31,924	<b>36,382</b>
Equity	35,509	<b>41,621</b>
Liabilities	18,990	<b>27,031</b>
<b>Structure of profit (mil. CZK)</b>		
Sales	108,907	<b>87,813</b>
Gross profit	12,763	<b>4,587</b>
EBITDA <sup>1)</sup>	10,643	<b>11,928</b>
EBIT <sup>2)</sup>	8,716	<b>9,897</b>
Net financial expenses	(47)	<b>131</b>
Profit / loss before tax	8,669	<b>10,028</b>
Net profit / loss	7,036	<b>7,975</b>
Profit / loss per share (CZK)	38.80	<b>43.98</b>
<b>Operating ratios (in thous. tonnes)</b>		
The volume of crude oil processed <sup>3)</sup>	6,495	<b>5,422</b>
Sales of refinery products, including retail (Benzina petrol station network) <sup>4)</sup>	5,800	<b>6,280</b>
Sales of petrochemical products <sup>5)</sup>	1,445	<b>1,069</b>

1) EBITDA – Operating income before amortization, financial result and taxes

2) EBIT – Operating income before financial result and taxes

3) The volume of crude oil processed represents the total amount of crude oil processed in Unipetrol refineries.

4) Sales of refinery products, including retail (Benzina petrol station network), are the total external sales volumes of refinery products outside Unipetrol Group. These are primarily motor fuels (petrol and diesel).

5) Sales of petrochemical products are total external sales volumes of petrochemical products outside Unipetrol Group.



# I. Unipetrol Group in 2016

## 1.1. Brief history of Unipetrol Group

### 1994

Unipetrol's creation fulfilled one of the conceptual objectives of privatization of the Czech petrochemical industry. Unipetrol was intended to joint selected Czech petrochemical firms in a group that would be able to compete with strong international groups. The majority shareholder (with 63 per cent of the shares) was the Czech state represented by the National Property Fund. The following joint-stock companies were gradually incorporated into Unipetrol: Kaučuk, Chemopetrol, Benzina, Paramo, Koramo, Česká rafinérská, Unipetrol Trade, Spolana and Unipetrol Rafinérie.

### 2003

KORAMO merged with Paramo and the successor company Paramo was created.

Česká rafinérská shifted to the reprocessing mode.

### 2004

Agreement between PKN ORLEN SA and the National Property Fund on the sale of 63% of shares of Unipetrol.

### 2006

Sale of the majority interest in the Spolana subsidiary to the Polish company Zakłady Azotowe ANWIL.

### 2007

Sale of the subsidiary KAUČUK to the Polish company Firma Chemiczna Dwory.

Creation of Butadien Kralupy, the shareholders of which are Unipetrol (51%) and KAUČUK (49%).

Merger of subsidiaries CHEMOPETROL and Unipetrol RAFINÉRIE with Unipetrol RPA.

### 2008

Right at the beginning of the year, the Board of Directors of Unipetrol approved an investment plan to expand the product portfolio of Unipetrol RPA.

By buying 49,660 shares Unipetrol increased its stake in Paramo to 91.77 per cent. In October, Unipetrol announced its plan to purchase the remaining shares from minority shareholders.

Based on the approved concept of implementation of an integrated management system in the entire Group, the pilot project, including certification of five selected companies (Unipetrol, Unipetrol RPA, Unipetrol Doprava, Unipetrol Services, Benzina) took place from October 1 to October 17.

### 2009

Unipetrol became a one-hundred-per cent owner of Paramo.

In late May, Unipetrol RPA announced a final shutdown of the unit producing oxo alcohols. The unit had been in operation since 1969.

Benzina introduced a significant enhancement of its fuel portfolio. As the first company on the Czech fuel market it began to sell a new formulation of the premium diesel with the cetane number 60. The product was named Verva and it was made available at 130 filling stations.



## 2010

Unipetrol and Unipetrol RPA decided to transfer their shares in Celio to TICATANOR Ltd. and B.E. Fin S.A. Celio is engaged in waste management and its sale was in line with Unipetrol Group's strategy the aim of which is to focus more on strategic segments.

A joint venture of Unipetrol and Synthos Kralupy, Butadien Kralupy started production in its new butadiene unit. A CZK 1.2 billion investment replaced the production unit operated by Synthos Kralupy.

The new unit shall increase the production capacity from 90 to 120 kt per year, which ranks the company among the 10 largest producers of butadiene in Europe.

The shutdown schedule for T200 heating plant in Chempark in Záluží was introduced. T200 heating plant is an obsolete source of electricity and steam and its operation - from 2013 onwards - will not meet the legislative requirements.

The energy services unit belonging to Unipetrol RPA will thereafter continue to operate the newer T700 heating plant.

Benzina started its cooperation with the fast-food chain Burger King which opened its first motorway restaurant in the Czech Republic at the Benzina Plus Filling Station on the third kilometre of the D11 motorway in the direction from Prague.

## 2011

At the beginning of the year, two new subsidiaries of Paramo were created within the restructuring process: Paramo Oil and Paramo Asfalt.

Unipetrol Group became the general partner of the International Year of Chemistry 2011 in the Czech Republic. The International Year of Chemistry 2011 was announced by UNESCO and the International Union of Pure and Applied Chemistry.

Benzina launched the first fully self-service filling station in the Czech Republic named Expres 24.

Three companies of Unipetrol Group managed to retain their certificates for a responsible approach to business in chemistry awarded by the Association of Chemical Industry of the Czech Republic. Thanks to this, Unipetrol, Unipetrol Doprava and Unipetrol RPA can use the Responsible Care logo.

In November, the production of high density polyethylene in Unipetrol RPA exceeded the value of 5 million tonnes.

The company has been producing polyethylene since 1976, the current production reaches 950 to 1000 tonnes of polyethylene per day.

## 2012

It was decided to shut down the urea producing unit in Chempark Záluží in Litvínov as of January 1, 2013.

The company decided to terminate permanently the processing of crude oil in the Pardubice refinery Paramo.

## 2013

Unipetrol Group strategy for the years 2013-2017 was published in June. This important document defines the key development trends for the coming years. Petrochemical segment is considered the key creator of the Group's profit and the majority of capital investments will be directed to this segment. Unipetrol will focus on achieving a significant increase in efficiency and operational excellence across all company segments. Implementation of the Strategy should ensure a strong financial position of the company, both in terms of liquidity and financial debt.

The pivotal Unipetrol's agreement is a three-year contract with Rosneft on supplies of Russian export oil (REB). It was signed in June and it was the first long-term agreement entered into by Unipetrol's majority shareholder PKN ORLEN on behalf of Unipetrol. The agreement is valid from July 1, 2013 to June 30, 2016.

In addition to the Strategy for 2013-2017, it is worth mentioning the acquisition of a 16.335% share in Česká rafinérská from Shell Overseas Investments B.V. which was signed on November 7, 2013. The acquisition was successfully finished on January 31, 2014. Unipetrol's share in Česká rafinérská increased from 51.22% to 67.555% and the company gained a qualified majority with the threshold of 67.5%.

## 2014

On January 31, 2014 the purchase of the 16.335% share in Česká rafinérská from Shell Overseas Investments B.V. was successfully finished, on the basis of which Unipetrol's share in the registered capital of Česká rafinérská increased from 51.22% to 67.555%.

Another important event was the exercise of the pre-emptive right to purchase the remaining 32.445% share in Česká rafinérská from Eni International B.V. Acceptance of the bid was announced on July 3, 2014, and the acquisition was non-finally approved by the Office for the Protection of Competition on December 19, 2014. Upon completion of the transaction, Unipetrol becomes the sole shareholder of Česká rafinérská with a 100% share.

It is also noteworthy that the significant strengthening of the long-term strategic cooperation with the University of Chemistry and Technology, Prague (UCT) resulted in creation of a new Educational and Research Centre UCT – Unipetrol. This connection represents a unique collaboration of industrial and educational sectors at the university level. Such intensive cooperation will enable students to use the scientific and research equipment in the research and educational centre UniCRE in Chempark Záluží with a maximum possible interconnection of research and educational activities.

## 2015

In 2014, Unipetrol used the pre-emption rights and accepted an offer from Eni International BV to acquire equity stake of Eni Česká rafinérská. The Office for the Protection of Competition (Úřad pro ochranu hospodářské soutěže, ÚOH) approved the purchase of equity interest of Eni International BV and the decision of ÚOH became legitimate on 6 January 2015. Upon completion of the transaction, Unipetrol became the sole owner of Česká rafinérská with the stake of 100%.

## 2016

A new contract, concluded on 1 January 2016, between Česká rafinérská and MERO ČR regulating the conditions of transport and storage of crude oil came into force on the same date. On 7 April 2016, the companies signed an addendum to an already-concluded contract that set a new tariff for transporting oil via IKL and Družba crude oil pipelines, valid from 1 April 2016 for an indefinite period. On the same day, the companies signed a contract to procure oil transportation through the TAL pipeline. The contract was concluded for an indefinite period.

On 10 June 2016, Unipetrol RPA signed a share purchase agreement with Anwil company, the basis on of which Unipetrol RPA acquired 100% of Spolana's share capital from Anwil. Spolana is a chemical company based in the Czech Republic whose main activity is the manufacture and sale of chemical products such as PVC, caprolactam, fertilizers, inorganic compounds and other chemicals. Spolana's takeover will enable Unipetrol to be more robust and flexible in product optimization, production, and sales of ethylene, and will also allow better coordination and integration of the product chain.

On 30 June 2016, Unipetrol RPA and PKN ORLEN signed with Rosneft company a contract for the supply of crude oil with a minimum volume of 2.9 million tonnes and a maximum volume of 5 million tonnes a year. The contract is valid until 30 June 2019. On the same day, a contract was signed for the supply of crude oil to Unipetrol RPA by Russian Tatneft company for 600 thousand tonnes of crude oil and on 13 December 2016 the companies signed an addendum the basis on which Tatneft will supply crude oil to Unipetrol RPA between 1,620 million tonnes and 3,960 million tonnes in the period between 1 January 2017 and 31 December 2019, depending on the Unipetrol RPA's means of taking deliveries.

## 1.2. Introducing Unipetrol Group

The Group operates refineries and performs petrochemical production and sales 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 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 of crude oil and wholesale of the refinery products,
- petrochemical production,
- retail sale of motor fuels.

Unipetrol is the 100% owner of the following companies:

- Unipetrol RPA a manufacturer and distributor of refined, petrochemical and agrochemical products, since January 1, 2016 the following entities were incorporated in the structure of Unipetrol RPA: Benzina branches, operator of the largest filling station network in the Czech Republic, research centre Polymer Institute Brno and support activities of Unipetrol Services. On February 1, 2017, the 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.

The main products of Unipetrol Group are refinery and petrochemical products.

Refinery products: gasoline, diesel, light fuel oil, aviation fuel, LPG, bitumen, naphtha, lubricating and fuel oils.

Petrochemical products: ethylene, propylene, C4 fraction, benzene, high-density polyethylene, polypropylene, ammonia, Chezacarb.



## 1.3. Business profiles of Unipetrol's main subsidiaries

### Unipetrol RPA

The company has manufacturing, sales and service units.

#### **CHIEF EXECUTIVE**

The unit provides supporting activities in corporate communication, human resources, legal services, marketing, security and regulatory risks.

#### **PRODUCTION**

The unit provides manufacturing of refinery, petrochemical and agrochemical products, supporting activities in supply with energies (electric power, steam), water, and it provides wastewater treatment.

#### **INVESTMENTS AND DEVELOPMENT**

The unit provides supporting activities in safety, technology and development and optimization of processes, investment and labs, fire brigade operation and operation of PIB Registered Branch (odštěpný závod PIB).

#### **RETAIL**

The unit provides the operation of Benzina branch, i.e. operation of fuel stations.

#### **FINANCE**

The unit provides supporting activities in reporting and accounting, taxation, financial management, controlling, IT, facility management, economy, planning and procurement.

#### **TRADE**

The unit provides sales of petrochemicals, agrochemicals and refinery petroleum products, logistics and activities of Benzina Registered Branch (odštěpný závod Benzina).

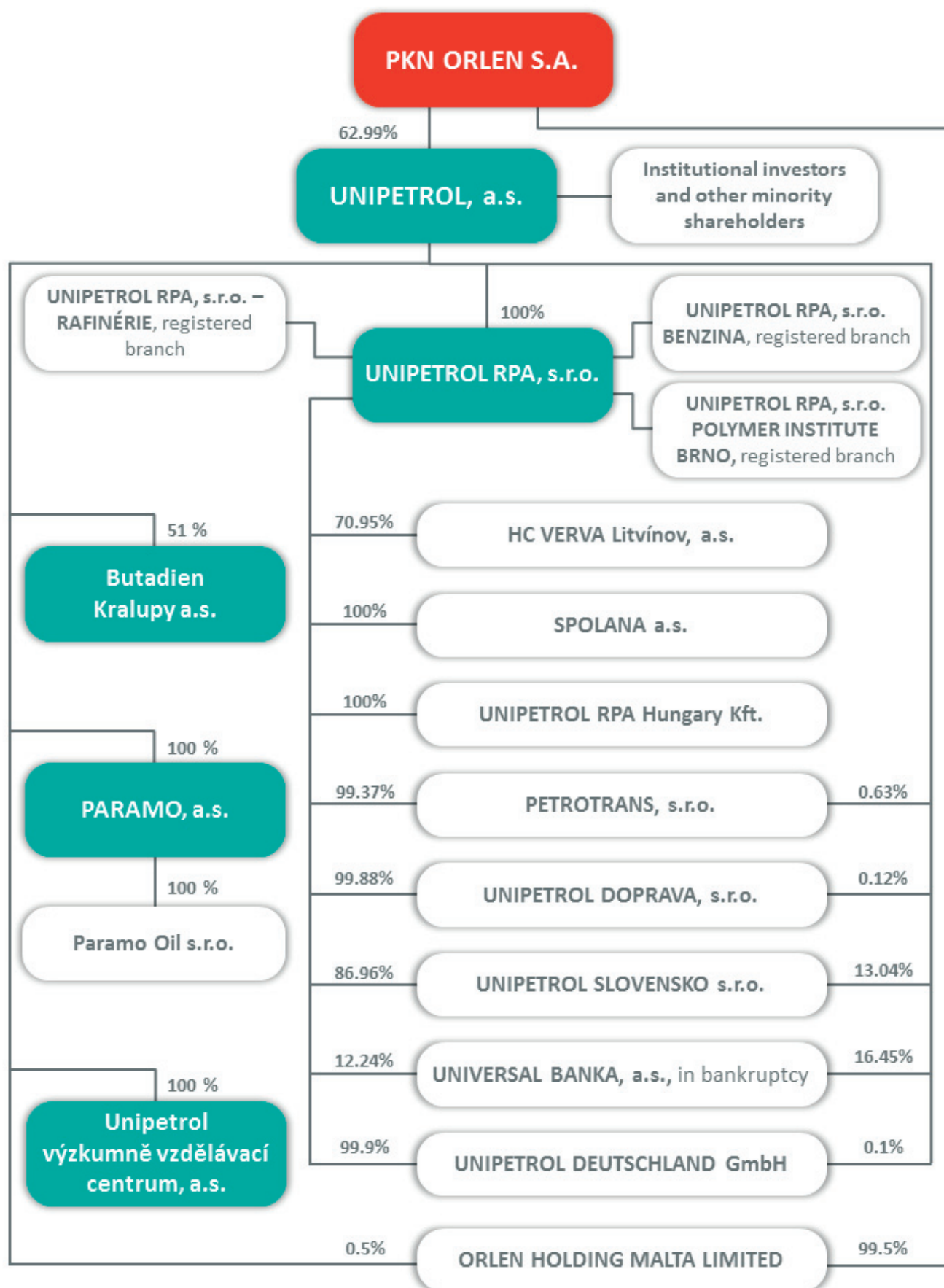
#### **STRATEGY, MERGERS AND ACQUISITIONS**

The unit provides supporting activities in marketing and strategic projects of the Group, purchase of oil and natural gas.

### Paramo

Manufacturing company Paramo produces asphalt products and lubricating and process oils, including related and ancillary products.

**Fig. 1 Ownership Structure of Unipetrol on January 1, 2017**



# II.A Common policy for responsible business in chemistry and integrated system of occupational safety and health, environmental protection and quality management

In November 2007, the Board of Directors of Unipetrol approved the "Policy for Responsible Business in Chemistry and Integrated System of Occupational Safety and Health, Environmental Protection and Quality Management" which builds on the previous "Joint Environmental Policy of Unipetrol Group" of 1999 and responds to the new Group structure and new Social Responsibility stimuli (Corporate Social Responsibility – CSR).

## THE POLICY FOR RESPONSIBLE BUSINESS IN CHEMISTRY AND INTEGRATED SYSTEM OF OCCUPATIONAL SAFETY AND HEALTH, ENVIRONMENTAL PROTECTION AND QUALITY MANAGEMENT

Unipetrol Group is one of the Czech Republic's leading industrial corporations and a national leader in the fields of crude oil refining and petrochemicals and it is also one of the major organizations in Central and Eastern Europe.

The Group seeks long-term profitability, competitiveness, high quality products and services, a high level of safety and environmental responsibility in production, commercial and logistics operations, including oil refining, petrochemical and agrochemical production, distribution, services in the field of railway transport, wholesale and retail trade with motor fuels, oils and other products.

As a member of the ORLEN Group, Unipetrol observes the principles of the Global Charter the "Responsible Care", sustainable development and social responsibility.

The Unipetrol Group's priority is to develop, produce, and transport products with minimal risks of an adverse impact on human health and the environment. To mitigate potential risks, Unipetrol introduces the "Product Stewardship - Product supervision and care" which includes product testing, informing customer chains about a broad range of product features and risk management measures where there is a potential risk to health, safety, or environment.

The Group implements and maintains an integrated management system which includes management system of occupational health and safety, environmental management system, and quality management system. In accordance with the integrated management system, Unipetrol Group agreed to adhere to the following commitments:

### 2.1. Product supervision and care

- Develop, produce, and distribute products with minimal risks of an adverse impact on human health and the environment.
- Test products, inform customers and the public on a wide range of product attributes and risk management measures where there is a potential risk to health, safety, or environment.



## **2.2. Compliance with legal and other requirements relating to occupational safety and health, product quality, and environmental protection**

- Fulfil legal requirements and other company-binding requirements in the field of occupational safety and health, environmental protection, and quality of products and services.
- Implement the best available technology wherever it is appropriate and efficient.

## **2.3. Integrated management system**

- Regularly review the appropriateness and adequacy of the integrated management system policy.
- Monitor, measure, and evaluate processes and measures in order to achieve continuous improvement of the Integrated Management System's efficiency.
- Record discrepancies and analyse the causes of process discrepancies, take appropriate corrective and preventive actions for their elimination.
- Continuously improve performance in the areas of occupational safety and health, environmental protection, and quality control of products and services.
- Include suppliers (both the legal and natural persons) in the management system, acquaint them with the principles and procedures used by the company and require their implementation.
- Provide the necessary resources for implementing and maintaining the integrated management system and for financing the system-related activities.

## **2.4. Preventive approach**

- Prefer preventive approach in the areas of occupational safety and health, environmental protection, quality of products and services, and protection of assets from the consequences of emergencies; maintain and test emergency and rescue systems.
- Operate facilities in a safe manner that protects the health of employees, suppliers, other companies, and inhabitants of the region, and has a minimal impact on the environment, quality of products, and their value.

## **2.5. Limiting the risks to safety, health and environment**

- Implement a system of prevention and management of risks to health, safety and environment in order to minimize the adverse effects of such risks and accidents and compensate for damage caused by such accidents to health, the environment, or property.
- Inform the public about the existence of health, safety, and environmental risks and adopted safety and preventive measures.
- Continuously identify hazards, assess risks, health and environmental impacts, and adopt and implement measures to eliminate or reduce the risks, minimize negative impacts arising from emergencies.
- Teach employees how to prevent adverse impacts of their activities on health, occupational safety and environment, product quality and property.

## **2.6. Open approach**

- Apply open approach to all parties involved.
- Maintain contact with all parties and promote an open attitude towards the public, especially the neighbouring towns and villages.

## **2.7. Evaluation of impacts on safety, health and environment**

- Evaluate the impacts on health, safety and the environment before starting a new activity or project, implementing change, or before stopping an operation, and apply the evaluation results so that adverse impacts are minimized.

## **2.8. Logistics and transport services**

- Provide logistics and transport services with regard to a high standard of safety, quality and environmental performance; implement and maintain the European "Safety & Quality Assessment System - SQAS" for transport services and assessment for cleaning transport facilities European Cleaning Document (ECD).

## **2.9. Rectification of old environmental burdens**

- Implement a long-term programme of rectification of old environmental burdens.

## **2.10. Customer focus**

- Maintain a high quality of products and services, adapt product specifications and services to customer requirements wherever it is possible and effective.
- Monitor information on customer satisfaction. Meet the needs and expectations of customers and requirements of other stakeholders (suppliers, employees and owners) in order to achieve their satisfaction and gain competitive advantages.

## **2.11. Training and education of employees**

- Educate, motivate, and raise awareness among employees, suppliers, and other business partners regarding security, occupational safety and health, environmental protection, and quality of supplied products and services.

## **2.12. Protection of company assets**

- Preserve and protect the company's assets. Adequately insure against indelible risks in order to reduce their impact on the company's assets.

## II.B Energy policy

In 2015, Unipetrol Group decided to implement the energy management system into the already established and certified environmental management systems (EMS), safety management (HSMS) and quality management (QMS) according to ISO 50001. Under this decision it adopted the below mentioned Energy policy.

### Energy policy

Unipetrol Group engages in refinery and petrochemical production and sales in the Czech Republic and the central European region. The Group companies mainly produce and sell refinery products, chemical and petrochemical products, polymers and special chemicals. The Group also runs its own transport services and finances its own research and development. Unipetrol is Czech Republic's leading refinery and petrochemical group and a major player in Central and Eastern Europe. The cost of energy production and purchase is the major item in its budgets.

Energy policy is based on values that the Group holds, that is **Responsibility – Development – People – Energy – Reliability**. One of the key priorities is to reduce the energy consumption and increase the efficiency of their use continuously. The Group's companies therefore implement, maintain and improve the energy management system (EnMS) according to ISO 50001. They declare that all requirements of this norm (including legal and other requirements) are met and the principle of continuous improvement in energy management is fulfilled. The Group is also committed to systematically reduce the negative impacts of their activities on the environment.

Group's companies undertake within the energy management system to:

- Comply with relevant legal and other requirements.
- Contribute to meeting national objectives on greenhouse gas emissions and increase of energy efficiency.
- Regularly examine performance in energy efficiency and establish relevant measures for its improvement.
- Optimize continually and systematically the energy consumption and associated costs, reduce the energy consumption in the long run.
- Use procurement processes as one of the key criteria of energy efficiency.
- Provide the necessary resources to meet the obligations of ISO 50001 norm.
- Ensure availability of all information related to the energy management system to all employees, to educate them in the area of energy efficiency, new technologies and their impact on the environment, require and motivate them to make them participate in fulfilling the objectives of the established energy management system.
- Cooperate with experts from the academic and professional community in meeting the objectives of the established energy management system.

Energy policy is binding for all employees.



# III. Activities of Unipetrol Group related to environmental protection in 2016

## 3.1. Environmental investments

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

In 2015, the Group implemented the below mentioned environmental investments:

### Česká rafinérská

Česká rafinérská implemented environmental protection investment projects in the total value of CZK 258.3 mil. These include in particular:

- Reconstruction of sewerage systems in Litvínov refinery – a project of a sewerage system repair connecting the visbreaking unit with de-oiling device was completed. The company started preparations for repair of sewerage in the Compact Block of the new refinery Litvínov and production units of feedstock for petrochemistry.
- In Litvínov refinery, first stage of the sloping system reconstruction at the new refinery Litvínov was carried out. The project will continue in the following year.
- In 2016, there were ongoing project preparations to ensure compliance with the requirements of so-called best available technologies BAT. On selected sources in both refineries, completion of continuous measurements emissions into the air will be made. Kralupy refinery will implement an installation of DeSOx additives dosing to the fluid catalytic cracker.
- In Kralupy refinery, a project of cistern yard storage tanks repair was carried out.
- In Litvínov refinery, the first phase of the repair project of a retaining facility on bottling track No. 69 was carried out.

### Unipetrol RPA

Environmental protection investment projects in the total value of CZK 46.3 mil. were implemented in Unipetrol RPA. The most important ones were:

- Preparation for installation of DeNOx and DeSOx technology in the T700 heating plant.
- Replacement of continuous emission measurement on T700 heating plant.
- Reconstruction of sewer system and manholes in the area of the steam cracker.
- Water supply and distribution for steam cracker handling areas.
- Completion of the construction of facilities for cleaning tanks in the mechanical polishing station.
- Completion of replacing filters on homogenization silos of the polypropylene production plant.
- Completion of the construction of cleaning surface for the needs of turnaround works.
- Preparation of project documentation for the construction of a new power unit of an steam cracker unit, including EIA.

A number of additional measures with a positive impact on the environment were carried out as part of the operating costs of the facility maintenance.

## Paramo

In Paramo, environmental investment projects in the total value of CZK 14.4 mil. were implemented. The most important ones were:

- Installation of the ground flare – safety element of the BA warehouse (Fuel Operation).

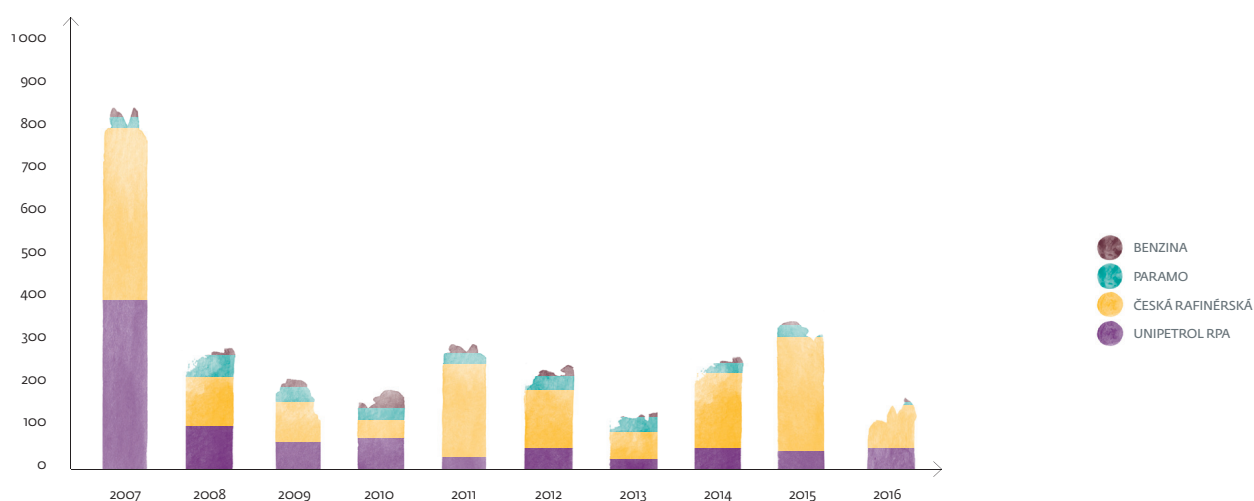
## Benzina

In Benzina, environmental protection projects were implemented in the total value of CZK 740 thousand. The most important ones were:

- Exchange of BioČOV at the filling station 479 Hradec nad Svitavou.
- Continuation of the project of change of rainwater disposal method. The project has passed several stages of implementation - from the feasibility study to commencement of the construction permission procedure. In 2016, this project included the remaining 24 filling stations in the Benzina network, two of which received a feasibility study with recommendation to continue and one of which received a negative conclusion due to inappropriate hydrogeological conditions. Permission procedure was initiated at another filling station. In the next seven cases, the original feasibility studies were submitted for redo.
- Shutdown of a non-compliant BioČOV ČS139 Sušice and connection of sewage water to public sewerage system.

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

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	389	85	76	81	25	62	26	63	46	59
Česká rafinérská	397	116	105	40	241	127	82	177	258	81
Paramo	26	59	14	20	7	18	7	10	14	2
Benzina	16	22	5	35	8	6	3	2	1	0,3
Unipetrol Group	828	282	200	175	281	213	117	252	320	142



## 3.2. The costs of environmental protection

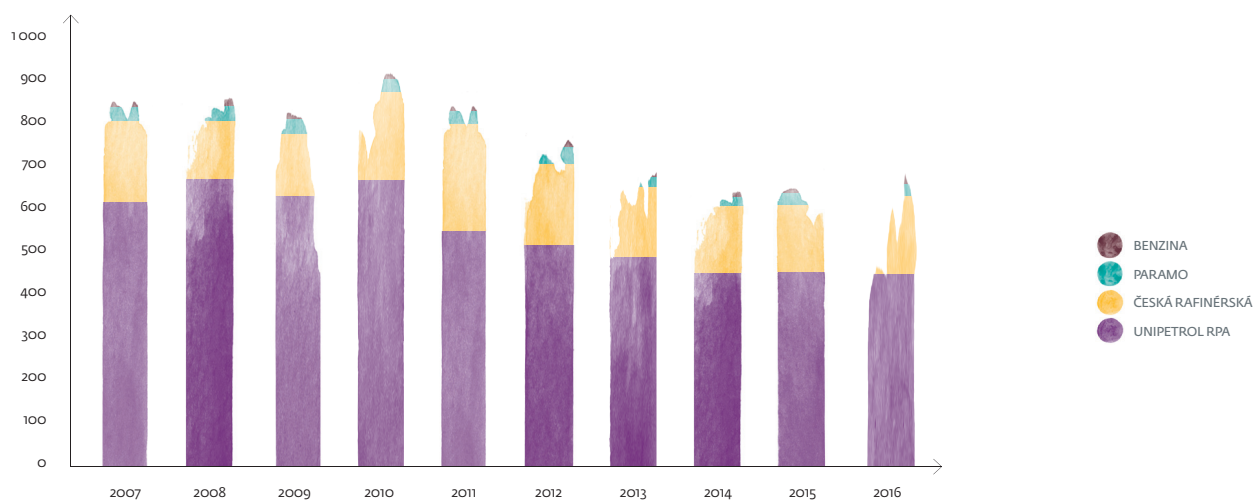
### Environmental operating costs

Costs associated with the operation of 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 high degree of raw material conversion, reduced amount of waste, and high energy efficiency have resulted in an overall reduction in environmental operating costs compared with the previous decade. The amount of environmental operating costs has been more or less stable in the last decade. Development trend of environmental operating costs in 2007–2016 is shown in the following table.

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

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	606	654	624	652	544	511	486	433	437	439
Česká rafinérská	203	166	144	202	254	185	176	168	170	187
Paramo	48	44	35	44	40	34	15	13	18	17
Benzina	5	5	5	6	3	4	2	3	3	3
Unipetrol Group	862	869	808	904	841	734	681	617	629	646



### Total costs of environmental protection

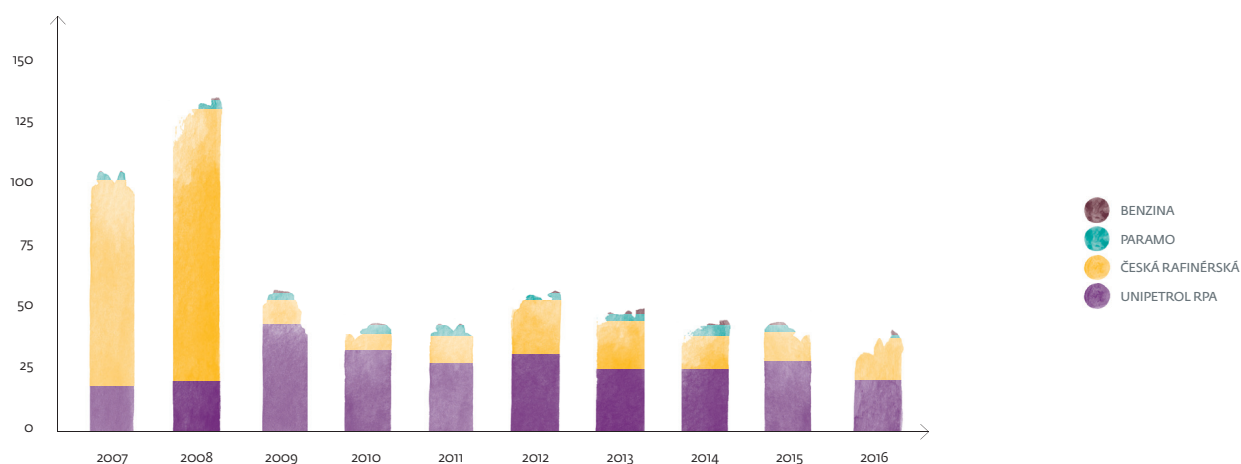
The total costs of environmental protection in Unipetrol Group include the costs of environmental investments, operating costs of environmental protection, restoration costs of environmental damage, and also charges for air pollution, wastewater discharges, waste disposal in landfills, provisioning for landfill reclamation, and compensations for pollution damage to forests. Development of charges and payments for environmental pollution and the total costs of environmental protection in the years 2006–2016 are shown in the following table. The decrease in fees and charges in 2009 in comparison with 2008 in Česká rafinérská is due to a change in methodology.



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

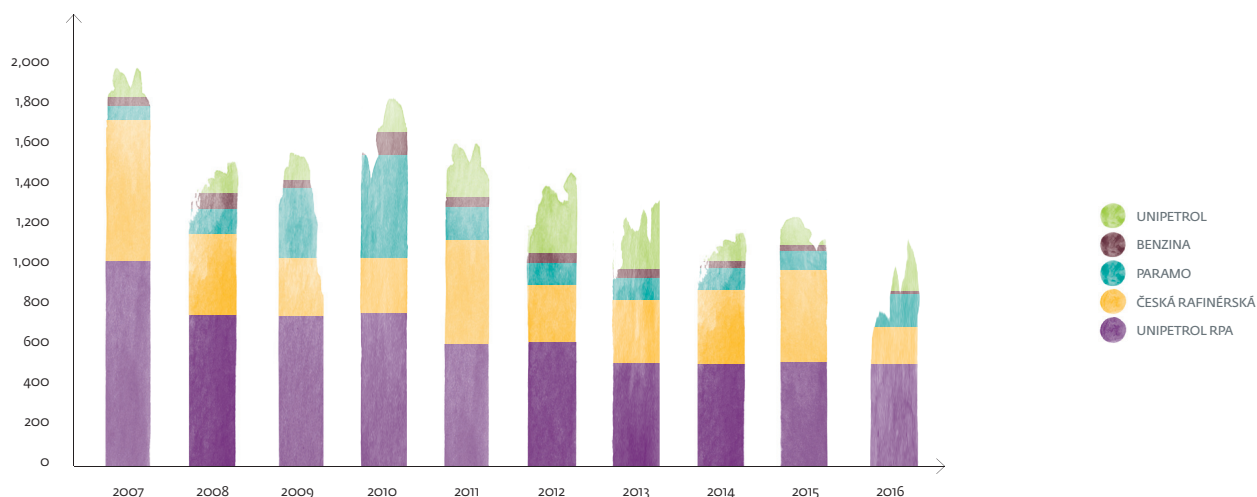
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	16	18	41	32	27	30	25	25	28	18
Česká rafinérská	89	113	12	7	10	23	23.8	18	13	16
Paramo	1	2	1.7	2.5	2.6	1.7	1.2	1.3	1	1.5
Benzina	0	0	0	0	0	0.2	0	0	0	0
Unipetrol Group	106	133	55	41	40	55	50	45	42	36

The total costs of environmental protection in 2016 amounted to a total of CZK 1.1 billion. The increase in the total costs in 2009 and 2010 compared to 2008 was mainly due to the commencement of new projects in the field of remedial works at both Paramo locations, the decline in 2011-2012 related to the interruption of remediation of contaminated soil from the former rhododendron lagoons in EC Kolín. The drop in costs in 2014 compared to 2013 was mainly due to lower costs for remediation of old environmental burdens.



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

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	1,011	757	741	764	596	603	537	521	532	524
Česká rafinérská	689	395	261	249	505	335	281	363	442	284
Paramo	85	119	346	591	179	114	158	79	80	129
Benzina	38	73	31	67	39	39	35	18	10	7
Unipetrol	148	144	159	148	256	343	306	182	147	172
Unipetrol Group	1,971	1,488	1,538	1,820	1,576	1,434	1,317	1,163	1,210	1,116



### 3.3. Management systems

Set management systems are a very important factor in environmental protection, product quality and occupational safety, health protection, fire protection or prevention of major accidents. Companies within Unipetrol Group have implemented and certified Environmental Management Systems (EMS), Security Management Systems (HSMS), and Quality Management Systems (QMS) in order to guarantee a system approach to environmental protection and occupational health and safety, product quality and services provided. Some of the companies have implemented the Energy Management System (EnMS) and had it certified as from 2016; by having done so they are also fulfilling the legislative requirement of the Energy Management Act.

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

In the second and third quarter of 2016, the recertification audit of management systems QMS, EMS and HSMS was carried out in Unipetrol companies, Unipetrol RPA (incl. Benzina Registered Branch), Česká rafinérská, Unipetrol Doprava and Petrotrans. In June 2016, EnMS system was certified in Unipetrol companies, Unipetrol RPA (incl. Benzina and Polymer Institute Brno Registered Branches) and Česká rafinérská. Certification institution Lloyd's Register quality Assurance confirmed compliance with system standards. Deadline of the certification audit was shortened by 1 year due to uniting the deadlines between Unipetrol Group and Česká rafinérská and uniting with the EnMS certification deadline.

### 3.4. Responsible Business in Chemistry Programme - Responsible Care

Responsible Care (hereinafter "R.C.") is a voluntary worldwide initiative of the chemical industry aimed at promoting the industry's sustainable development by increasing the safety of facilities, product transport, and 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 an award of the United Nations Environment presented at the World Summit in Johannesburg.

The national version of the R.C. programme initiative which was officially launched in October 1994 by the Minister of Industry and Trade (SCHP ČR) and 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, the permission to use the logo of the Responsible Care programme was repeatedly bestowed to Unipetrol and Unipetrol Doprava. After resuming its membership in the ACI CR in 2016, Unipetrol RPA will be repeatedly redefending its right to use the R.C. logo in 2017. As Paramo is no longer member of the Association of Chemical Industry of the Czech Republic, it does not use the authorization, although it continues to meet the principles.

## Management systems certified/verified in Unipetrol Group in 2016

Company	Verifier	Certification	Certification dates	Recertification outlook
Unipetrol RPA	LRQA	ISO 14001	2002, 2005, 2008, 2011, 2014, 2016	2018
Unipetrol RPA	LRQA	ISO 9001	1996, 1999, 2002, 2005, 2008, 2011, 2014, 2016	2018
Unipetrol RPA	LRQA	OHSAS 18001	2005, 2008, 2011, 2014, 2016	2018
Unipetrol RPA	LRQA	ISO 50001	2016	2019
Unipetrol RPA	SCHP ČR	Responsible Care	1996, 1998, 2000, 2002, 2004, 2008, 2011, 2014	2017
Unipetrol RPA	SGS Germany	ISCC	2011, 2012, 2013, 2014, 2015, 2016	2017
Paramo	LRQA	ISO 14001	2003, 2006, 2009, 2012, 2015	2018
Paramo	LRQA	ISO 9001	1996, 2000, 2003, 2006, 2009, 2012, 2015	2018
Paramo	LRQA	OHSAS 18001	2007, 2009, 2012, 2015	2018
Paramo	SCHP ČR	Responsible Care	2001, 2003, 2005, 2008, 2012	-
Paramo	SCHP ČR	Sustainable Development Award	2008	-
Unipetrol Doprava	LRQA	ISO 14001	2007, 2008, 2011, 2014, 2016	2018
Unipetrol Doprava	LRQA	ISO 9001	2005, 2008, 2011, 2014, 2016	2018
Unipetrol Doprava	LRQA	OHSAS 18001	2008, 2011, 2014, 2016	2018
Unipetrol Doprava	MOODY International	SQAS	2006, 2009, 2012, 2015	2018
Unipetrol Doprava	SCHP ČR	Responsible Care	2011, 2014	2017
Unipetrol Doprava	Drážní úřad	ECM	2013	2018
Benzina	LRQA	ISO 14001	2008, 2011, 2014, 2016	2018 *
Benzina	LRQA	ISO 9001	1996, 1999, 2002, 2005, 2008, 2011, 2014, 2016	2018 *
Benzina	LRQA	OHSAS 18001	2008, 2011, 2014, 2016	2018 *
Benzina	LRQA	ISO 50001	2016	2019 *
Česká rafinérská	LRQA	ISO 14001	2001/2005, 2007, 2010, 2013, 2016	2018 *
Česká rafinérská	LRQA	ISO 9001	2001/2004, 2007, 2010, 2013, 2016	2018 *
Česká rafinérská	LRQA	OHSAS 18001	2007, 2010, 2013, 2016	2018 *
Česká rafinérská	LRQA	ISO 50001	2016	2019 *
Česká rafinérská	SCHP ČR	Responsible Care	2000/2002, 2004, 2008, 2012	2017 *
Unipetrol	LRQA	ISO 14001	2008, 2011, 2014, 2016	2018
Unipetrol	LRQA	ISO 9001	2008, 2011, 2014, 2016	2018
Unipetrol	LRQA	OHSAS 18001	2008, 2011, 2014, 2016	2018
Unipetrol	LRQA	ISO 50001	2016	2019
Unipetrol	SCHP ČR	Responsible Care	2000, 2003, 2005, 2007, 2011, 2014	2017

\* as Registered Branch (odštěpný závod) of Unipetrol RPA

# IV. Compliance with laws on environmental protection

## 4.1. 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. The scope of this act includes, among other things, all production companies in chemical and refining industries.

In 2013, an amendment to the Integrated Prevention Act and its implementing decree were issued within the framework of the Industrial Emissions Directive provisions implementation. Unipetrol Group participated in the preparation of both legislations, including related methodologies, through the Czech Chemical Industry Association. During 2014, the background and baseline reports were prepared for all manufacturing companies. They were subsequently submitted to the relevant regional authorities for approval together with a proposal of conditions for ensuring groundwater monitoring.

Companies within Unipetrol Group, either directly or through industry associations and NGOs, participated in the preparation and consultation process of further new legislation of the Czech Republic and the EU and the related documents (e.g. BREF documents). At the end of 2014, the Conclusions on BAT for oil and gas refineries were officially published in the Official Journal of the European Union. In 2016, work continued on the revision of the BREF documents for large combustion plants and large-scale production of organic substances. In May 2016, they were officially published in the Official Journal of the European Union for wastewater and gas cleaning.

Integrated permits (IP) for refineries in Litvínov and Kralupy have been issued for the refineries as a whole, without any breakdown into individual plants. Changes of integrated permits were carried out in relation with new investment projects the scope of which required a change in the integrated permit.

The integrated permit for Litvínov refinery was issued by the Regional Authority of the Ústí Region on December 15, 2003. In 2016, a decision No. 12 of the integrated permit was issued by the Regional Authority of the Ústí Region in connection with the implementation of BAT (best available techniques).

The integrated permit for Kralupy refinery was issued by the Regional Authority of the Central Bohemia Region on 9 February 2004. Due to mainly procedural errors by the permit authority during the IP issue, the decision was later revoked and the Regional Authority of the Central Bohemia Region issued a new integrated permit decision on 13 March 2008, incorporating all equipment of Kralupy refinery. In 2016, amendments 8, 9, 10 and 11 of the integrated permit were issued by the Regional Authority of the Central Bohemia Region, in particular in connection with the implementation of the best available techniques (BAT).

Changes related, for example, to the approval of pyrolysis furnace renewal, the implementation of requirements for leakage tests of the reclaimed sewerage of the ethylene unit, the approval of the updated operating rules for the ethylene unit production plant, the approval of the upgraded mazut gasification plans, the change of conditions for the operation of the plant and of the floatation conditions, approval of operating rules and emergency plans of the Energy Services Unit, approval of drawing of funds from the financial reserve for the implementation of the project for the Reconstruction of Pontoons on the New ash dump, replacement of the filtering units of the polypropylene production homogenization silos, approval of the updated operating rules for the polypropylene production unit, update on the description of the equipment of individual production units due to the approved planned changes in the given facilities.

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 the operation of power engineering, asphalt operation and fuel and oil operation. As from 2014, one common integrated permit applies to all operations in EC Pardubice. In the course of 2016, the IP was updated (reducing the power consumption of the boiler below 50MW and disconnecting the boiler K3). EC Kolín obtained one integrated permit issued by the Regional Authority of the Central Bohemia Region. In the course of 2016, the IP was updated twice due to the IP review with regard to BAT application and the definition of new emission limits (boiler room, RDH) with effect from 1 January 2020. Permits are changed on an ongoing basis according to planned investments, termination of partial technological equipment operations and changes in legislation.



## Overview of valid integrated operating permits on December 31, 2016

Production unit	Integrated permit (issuer, date of issue)
<b>Unipetrol RPA</b>	
Production of polypropylene and polyethylene	Regional Authority of the Ústí Region; issued on December 16, 2003 for an indefinite period, 17 amendments
Ethylene unit, incl. naphthalene concentrate production	Regional Authority of the Ústí Region; issued on February 21, 2005 for an indefinite period, 16 amendments
Production of ammonia	Regional Authority of the Ústí Region; issued on June 12, 2006 for an indefinite period, 9 amendments
Heating oil gasification unit	Regional Authority of the Ústí Region; issued on July 12, 2006 for an indefinite period, 11 amendments
Energy services unit	Regional Authority of the Ústí Region; issued on October 11, 2007 for an indefinite period, 35 amendments
Production of dicyclopentadiene and non-hydrogenated C9 fraction	Regional Authority of the Ústí Region; issued on February 23, 2009 for an indefinite period, 1 amendment
<b>Česká rafinérská</b>	
Litvínov refinery	Regional Authority of the Ústí Region; issued on December 15, 2003 for an indefinite period, 12 amendments
Kralupy nad Vltavou refinery	Regional Authority of the Central Bohemia Region; issued on March 13, 2008 for an indefinite period with the exception of the part setting conditions for discharging wastewater (this part is valid until December 31, 2019), 11 amendments
<b>Paramo</b>	
Refinery plant, cost centre Pardubice	Regional Authority of the Pardubice Region; published in the version of the 8th amendment to the original IP Energy of February 2, 2004 for an indefinite period (modified on June 1, 2016)
Cost centre Kolín	Regional Authority of the Ústí Region; issued on May 31, 2005 for an indefinite period, 12 amendments

### Integrated pollution register

In the Czech Republic, Integrated Pollution Register (IPR) is kept under the Act No. 25/2008, as amended and in accordance with the Regulation of the European Parliament and of the Council No. 166/2006 establishing The European Pollutant Release and Transfer Register (E-PRTR).

Pollution registers (IRZ and E-PRTR) for individual companies and sectors register data on emissions of 93 reported substances into the air, water and soil, on their transfers in waste and wastewaters, and transfers of hazardous and other wastes. Yearly data for IPR and E-PRTR are obtained from companies through the Integrated system of reporting obligations (ISRO). The companies must deliver the data by March 31 and the data are subsequently published on the IRZ server by 30 September. The legislation requires that companies report substances emissions of which have reached or exceeded a certain threshold value to the Integrated pollution register IPR.

## 4.2. Air pollution control, wastewater discharges, waste management

All companies within the Group maintain compliance of company operations with the requirements of laws on environmental protection. Air pollution sources are operated in accordance with the applicable operational rules. Authorized measurements of emissions are performed in legal terms. All facilities dispose of approved water management plans. Wastewater quality is regularly monitored. Emission limits for pollutants in sewage water are met. All plants have their waste management plans processed and approved, waste is monitored and recorded in accordance with the legislation in force.

Compliance with legislation is monitored by the company management and by the Group headquarters. It is also independently verified by administrative authorities and certification bodies and in companies participating in the "Responsible Care" programme also by the Association of Chemical Industry of the Czech Republic. In case of deviations from the requirements of legal requirement, the appropriate corrective actions are implemented without delay. Administrative authorities may impose fines for such deviations.

### Wastewater discharges

Over the past five years, emissions of pollutants into the environment have been stable due to massive environmental investments that were made over the previous decade.

The amount of pollution discharged into wastewater is steadily declining. The decline was achieved through a number of investment and non-investment measures, e.g. an extensive reconstruction of biological wastewater treatment in Unipetrol RPA in 2007-2009, reconnection of urban wastewater to the newly built sewage treatment plant in 2010, segregation of industrial water from the common sewerage system into the industry sewerage system, and many other measures. Between 2013 and 2015, a large-scale reconstruction of the wastewater treatment plant was carried out in Kralupy refinery and since 2016, the treatment plant has been in a two-year trial operation. In Kralupy refinery, the reconstruction of oiled sewerage system took place in several phases between 2012 and 2015.

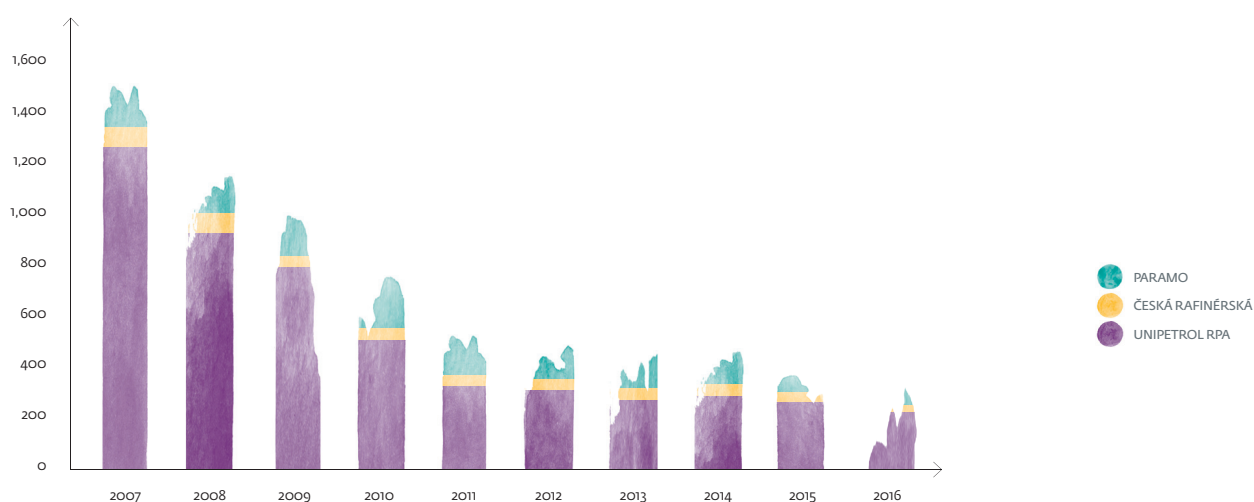
The shutdown or more precisely limited operation of production units had an impact on the reduction of pollution by Unipetrol RPA in 2015 as a result of the steam cracker accident in August 2015.

#### Pollutants discharged in wastewater by the Group (t/year)

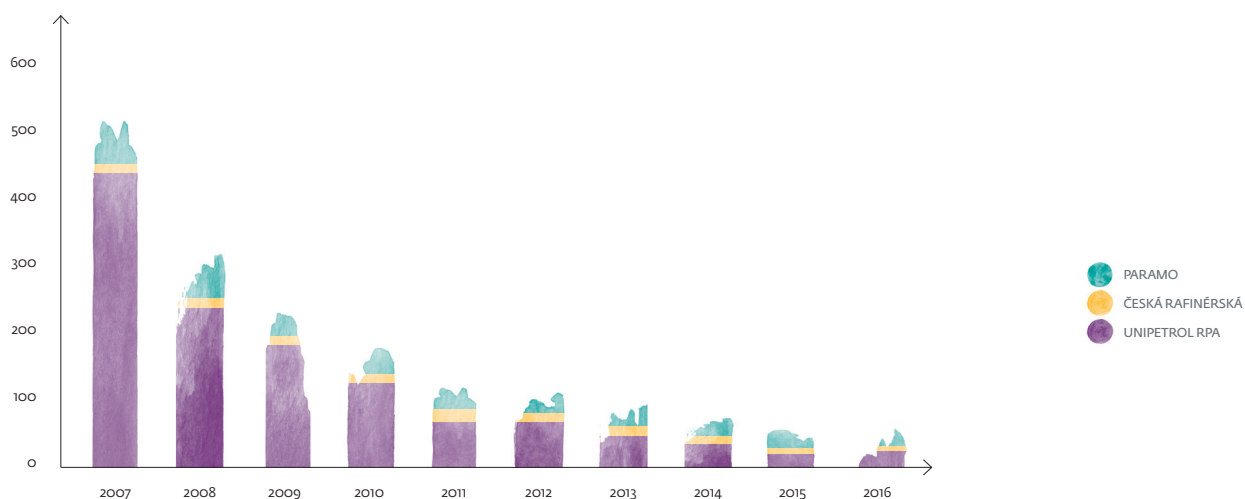
Year	Parametr	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<b>Unipetrol RPA</b>	CHSK	1,261	932	780	500	329	311	277	290	258	220
	BSK5	435	237	171	122	62	59	48	37	16	19
	NL	395	241	302	208	155	153	111	83	34	32
	Oil substances	5	3	2	3	1	1	2	1.3	0	0.4
<b>Česká rafinérská <sup>1)</sup></b>	CHSK	66	71	49	37	37	37	38	38	30	18
	BSK5	11	15	14	15	18	12	16	13	8	7
	NL	45	49	46	49	48	39	42	41	29	29
	Oil substances	3	1	2	1	2	1	1	1	1	0.5
<b>Paramo</b>	CHSK	171	163	154	192	153	111	116	104	84	69
	BSK5	65	59	35	38	32	36	26	24	19	17
	NL	27	27	26	32	50	34	39	25	18	13
	Oil substances	6	8	6	7	6	4	3	1.33	1	0.9
<b>Unipetrol Group</b>	CHSK	<b>1,498</b>	<b>1,166</b>	<b>983</b>	<b>729</b>	<b>519</b>	<b>459</b>	<b>431</b>	<b>432</b>	<b>372</b>	<b>307</b>
	BSK5	<b>511</b>	<b>311</b>	<b>220</b>	<b>175</b>	<b>112</b>	<b>107</b>	<b>90</b>	<b>73</b>	<b>43</b>	<b>43</b>
	NL	<b>467</b>	<b>317</b>	<b>374</b>	<b>289</b>	<b>253</b>	<b>226</b>	<b>192</b>	<b>148</b>	<b>81</b>	<b>74</b>
	Oil substances	<b>13</b>	<b>12</b>	<b>10</b>	<b>11</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>3</b>	<b>2</b>

<sup>1)</sup> only in Kralupy

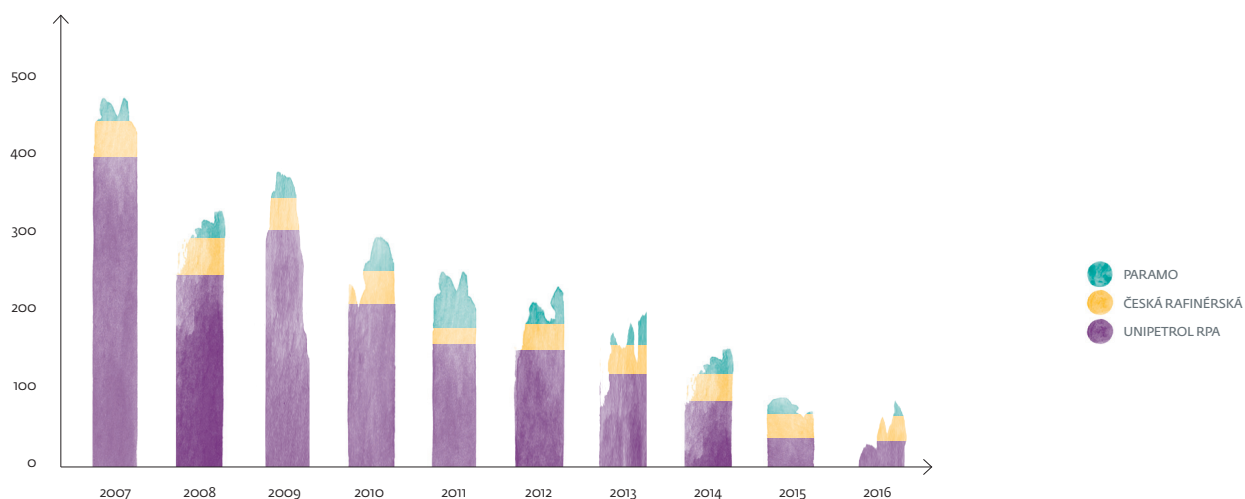
#### CHSK



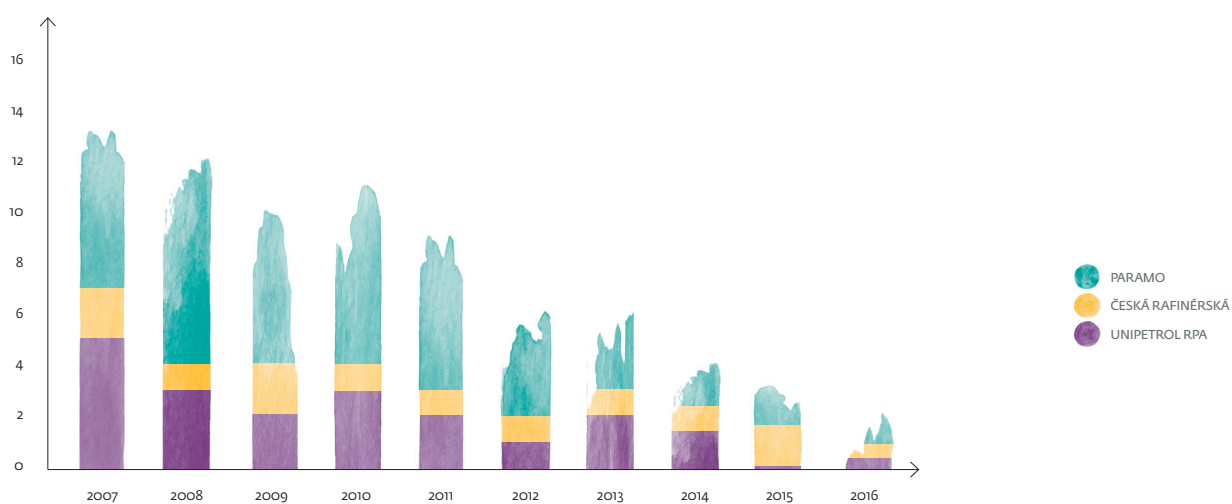
## BSK<sub>5</sub>



## NL



## Oil substances



## Waste management

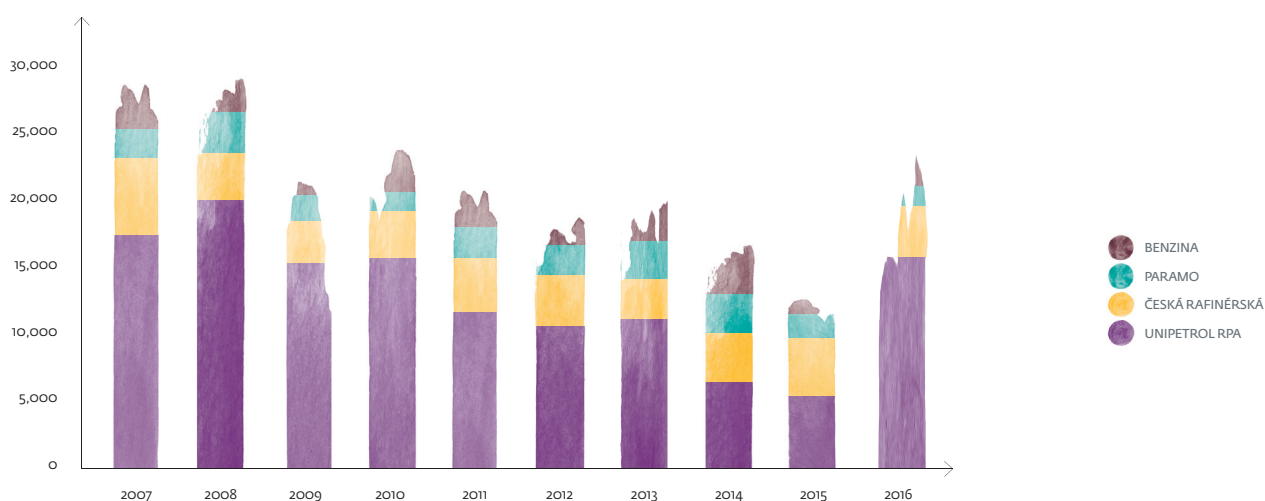
Unipetrol Group managed to achieve significant reduction of volume of both overall and hazardous waste in the long term. In the period 2007–2010, the amount of waste was more or less stable with only minor fluctuations caused by stop works or major capital constructions. Between 2011 and 2012, there was a reduction in waste production compared to previous years, mainly due to the reduced amount of waste generated during demolition and construction works. Other waste reduction at Unipetrol RPA was achieved by improvements in the quality of plastic products which no longer have to be classified under sub-wastes because they now meet the quality requirements on products. The increase of the waste volume in 2016 was caused by the waste generated due to elimination of the consequences which occurred due to the steam cracker accident. Increased production of hazardous waste in Paramo in 2013 was due to liquidation (selling) of larger volumes of waste slop oils.

### Waste production in the Group (t/year)

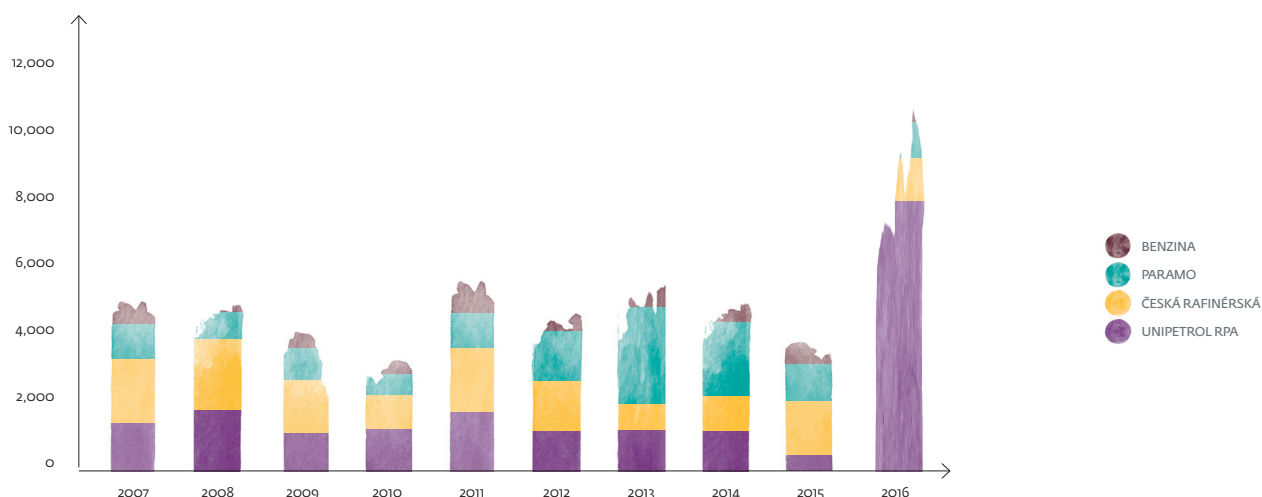
Year	Parametr	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	Total	17,065	19,818	15,261	15,693	11,563	10,290	10,904	6,368	5,177	15,514
	Of which is hazardous waste	1,309	1,661	914	1,067	1,644	1,067	1,002	1,038	389	7,787
Česká rafinérská <sup>1)</sup>	Total	6,599	3,911	3,323	3,103	4,113	3,809	3,043	3,565	4,336	3,928
	Of which is hazardous waste	1,932	1,985	1,663	1,078	1,936	1,534	806	1,075	1,540	1,421
Paramo	Total	1,983	2,821	1,723	1,449	2,048	2,280	3,439	3,038	1,841	1,796
	Of which is hazardous waste	1,115	939	1,060	629	1,151	1,465	2,957	2,307	1,128	1,128
Unipetrol Doprava	Total	2,419	2,094	722	3,352	2,539	1,766	2,364	3,394	953	1,870
	Of which is hazardous waste	527	214	344	393	906	400	532	361	654	300
Unipetrol Group	Total	<b>28,066</b>	<b>28,644</b>	<b>21,029</b>	<b>23,597</b>	<b>20,262</b>	<b>18,145</b>	<b>19,750</b>	<b>16,365</b>	<b>12,307</b>	<b>23,108</b>
	Of which is hazardous waste	<b>4,883</b>	<b>4,799</b>	<b>3,981</b>	<b>3,167</b>	<b>5,632</b>	<b>4,466</b>	<b>5,298</b>	<b>4,781</b>	<b>3,710</b>	<b>10,636</b>

<sup>1)</sup>including investment activities

### Total



## Hazardous waste



## Air protection

The increase in emissions of sulphur dioxide and nitrogen oxides in the Litvínov refinery in 2009 was caused by a boiler failure on Claus III unit. In 2010, the operation was stabilized and the emissions decreased. Increased emissions of SO<sub>2</sub> in 2011 are due to the combustion of part of hydrogen sulphide gases while repairing the sulphur production facility. The reduction of SO<sub>2</sub> emissions in Česká rafinérská and Unipetrol RPA in 2013 compared to 2011 and 2012 was due to extensive repairs of the liquid sulphur production facilities and their subsequent trouble-free operation. Emissions of Česká rafinérská in 2016 are lower as there were temporary production shutdowns in both refineries.

Since 2007, Unipetrol RPA has been steadily decreasing the total amount of pollutants released into the air. The decrease was caused by the gradual reduction of output of the older T200 heating plant (shut down permanently in 2011), optimization of operation of the newer T700 heating plant and other pollution sources. A certain increase in emissions of solids in 2010 was mainly due to a lower quality of filters in the T200 heating plant (before its shutdown). The reduction of SO<sub>2</sub> emissions in 2013 was due to the increased rate of desulphurization in T700. The reduction of VOC and NO<sub>x</sub> emissions in the years 2012–2013 was due to the shutdown of the T200 heating plant, due to the ongoing repairs of TG 11, and also thanks to use of a higher DNC+ control on the ethylene unit control system, and, last but not least, due to legislation change which modified VOC balancing. The amount of VOC was also influenced by changes in the composition of the fuel used in the T700 heating plant. Emissions from Unipetrol RPA's plants have fallen thanks to reduction of the SC operation after the fire.

In Paramo only natural gas was burnt in the boilers of EC Pardubice and EC Kolín, which resulted in a further reduction of emissions of sulphur dioxide, particulate pollutant emissions, and volatile organic substances in the year-on-year comparison. The reduction of overall emissions from combustion processes has been achieved despite the increase in oil processing in EC Kolín. The decrease in the amount of pollutants released into the air was also supported by non-operation of some sources of air pollution in the Paliva (Fuels) unit and by the limitation of the total input power of boiler in EC Pardubice (only one boiler K1 was in operation, boiler K2 as a backup source, boiler K3 disconnected).

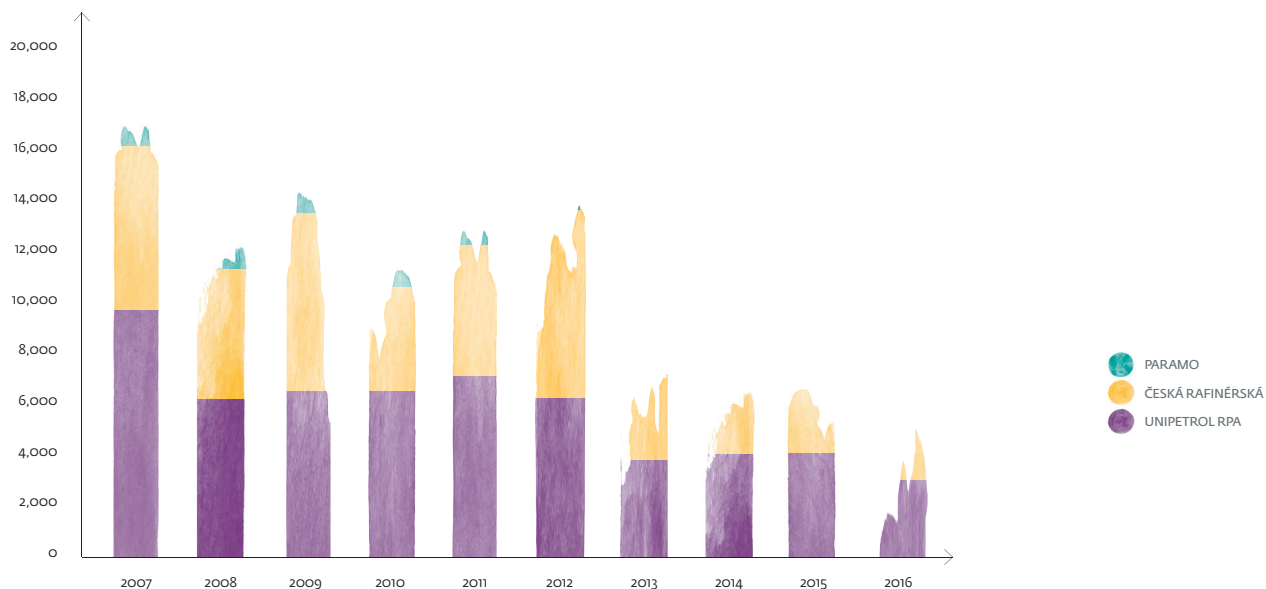


## Pollution emitted into the atmosphere by the Group (t/year)

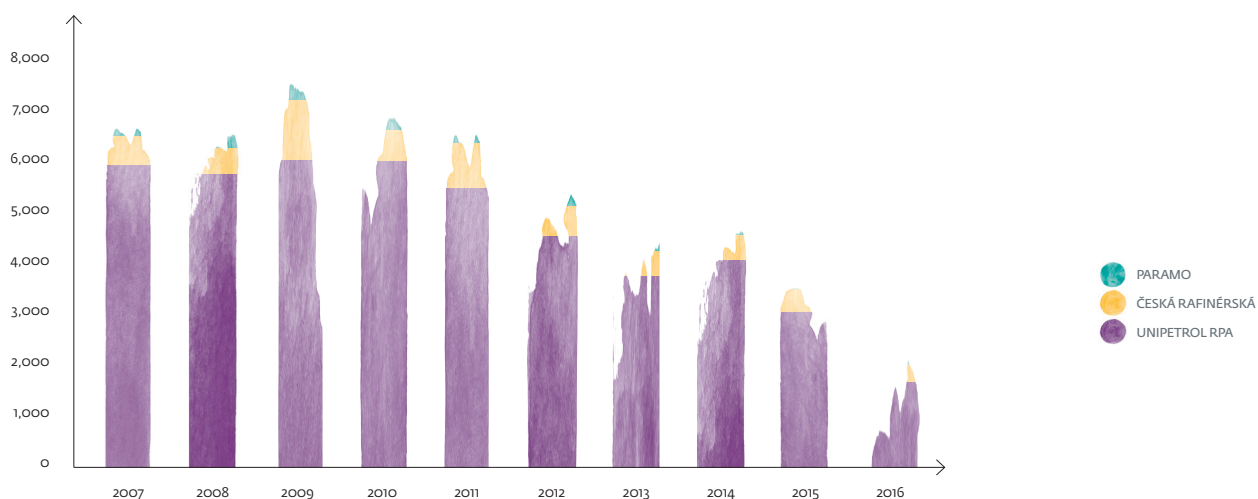
Year	Parametr	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	SO <sub>2</sub>	9,691	6,143	6,397	6,290	7,039	6,235	3,700	3,973	4,124	2,959
	NOx	5,839	5,695	5,959	5,954	5,388	4,541	3,755	3,958	3,007	1,648
	Solids	281	210	122	255	145	132	99	85	67	65
	VOC	381	400	379	367	334	281	33	31	18	7
Česká rafinérská	SO <sub>2</sub>	6,469	5,166	7,121	4,234	7,220	7,481	3,375	2,334	2,342	1,934
	NOx	604	567	1,259	612	906	665	532	563	440	322
	Solids	24	19	18	14	12	20	22	50	33	20
	VOC	113	127	111	117	118	121	119	124	117	90
Paramo	SO <sub>2</sub>	749	721	742	546	389	44	9	0.41	3	3
	NOx	208	212	239	219	175	74	33	27	28	36
	Solids	29	30	31	20	19	3	0	0.35	0.4	0.4
	VOC <sup>1)</sup>	304	293	231	178	520	413	343	318	349	332
Unipetrol Group	SO <sub>2</sub>	<b>16,909</b>	<b>12,030</b>	<b>14,260</b>	<b>11,070</b>	<b>12,690</b>	<b>13,760</b>	<b>7,084</b>	<b>6,307</b>	<b>6,469</b>	<b>4,896</b>
	NOx	<b>6,651</b>	<b>6,474</b>	<b>7,457</b>	<b>6,785</b>	<b>6,469</b>	<b>5,280</b>	<b>4,328</b>	<b>4,548</b>	<b>3,475</b>	<b>2,006</b>
	Solids	<b>334</b>	<b>259</b>	<b>171</b>	<b>289</b>	<b>176</b>	<b>155</b>	<b>121</b>	<b>136</b>	<b>101</b>	<b>85</b>
	VOC	<b>798</b>	<b>820</b>	<b>721</b>	<b>662</b>	<b>972</b>	<b>815</b>	<b>497</b>	<b>473</b>	<b>484</b>	<b>429</b>

<sup>1)</sup> 90% are fugitive emissions that are reported only on the basis of solvent purchases in the given calendar year.

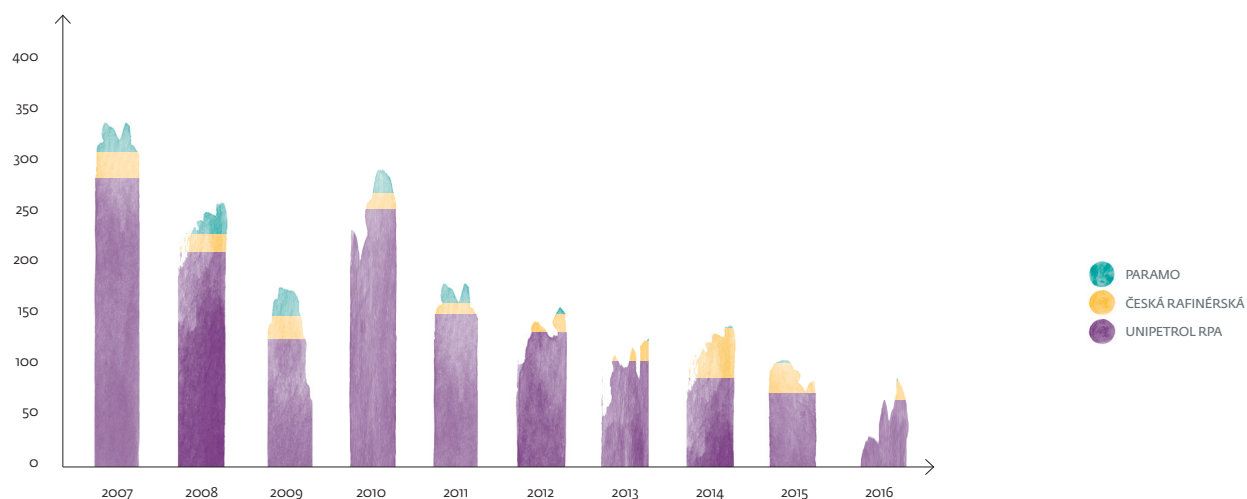
## SO<sub>2</sub>



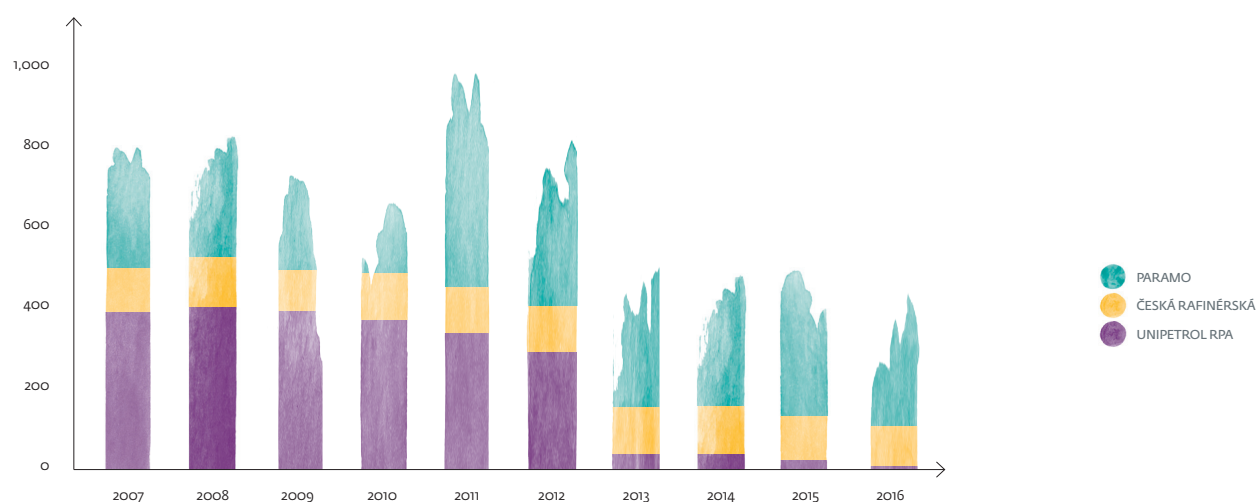
## NOx



## Solids



## VOC



## 4.3. Environmental Impact Assessment

A notice of intent within the scope of Annex No. 4 to Act No. 100/2001 Coll. for the construction of a new boiler plant for the steam cracker with a heat output of less than 200 MW has been submitted to the Ministry of the Environment, which subsequently decided in the inquiry procedure that the project titled "The steam cracker production boiler plant design of Unipetrol RPA has no significant environmental impact and will not be assessed under the EIA Act".

No assessment took place at Česká rafinérská in 2016 in respect of the EIA (Environmental Impact Assessment) methodology.

In connection with the investment plan at the boiler plant in Paramo EC Kolín (installation of new boilers), a sub-limit plan was announced under Annex 3a, Act No. 100/2001 Coll. Finally, it was decided to implement the project in a different way - replacing existing burners with low emission burners (without EIA).

No assessment took place at the remaining companies of the Group in 2016 in respect of the EIA (Environmental Impact Assessment) methodology.

## 4.4. Penalties for breaching the requirements of environmental laws

The consistent effort to comply with the regulations on environmental protection is evidenced by the low number of cases of partial breaches of the requirements of environmental laws which has occurred due to abnormal operating conditions in the last five years, i.e. in 2011–2015. In that period, the Group companies received ten fines, only five of which for more serious violations of water protection obligations exceeded CZK 100,000.

### Overview of fines imposed for breaching the environment-related duties between 2011 and 2016

Company	Year	Reason for sanction	Amount of sanction (thous. CZK)	Note
Unipetrol RPA	2011	Exceeding the AOX "m" indicator limit in the wastewater discharged in 2010	120	Paid
Unipetrol RPA	2017	Violation of integrated permit conditions during wastewater discharges (vanadium content) in 2015	30	Paid
Česká rafinérská	2013	Violation of provisions of the Water Act	350	Paid
Česká rafinérská	2015	Violation of provisions of the Water Act	500	Paid
Paramo	2011	Incorrect labelling of retail packaging	31	Paid
Paramo	2011	Violation of provisions of the Water Act	6	Paid
Paramo	2012	Incorrect labelling of retail packaging	6	Paid
Paramo	2013	Overfilling of the VR10 tank with diesel fuel	350	Paid
Paramo	2015	Leakage of 31% HCl while drawing from RTC to CHUV	240	Paid
Paramo	2016	Violation of provisions of the Act on Air Protection	15	Paid

# V. Reducing environmental and operating risks and prevention of major accidents

## 5.1. Prevention of major accidents

The companies belonging to the Group pay much attention to the prevention of major accidents in the long term. The basis for prevention of accidents is a 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 companies within 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 case of exceeding the specified operating parameters. Depending on the type of hazardous substances, the plants are equipped with modern detection systems (detection of flame, smoke, or releases of hazardous substances) connected to signalling panels in the control rooms and operation centres of the fire brigade. There are fixed or semi-fixed extinguishing systems and fire monitors installed in the plants.

Regular internal audits of security and risk prevention of accidents take place in all the Group companies. Furthermore, state technical supervision bodies perform regular external audits and inspections. The bodies include CEI, OIP, FRS, RHS professional organizations, insurance brokers, insurers and foreign reinsurers. Recommendations and findings of these audits are incorporated in the respective implementation plans.

An important component of prevention of serious accidents is the regular training of employees. Functionality of the serious accident prevention system is tested throughout the year through simulations of both emergency and crisis situations. The testing is performed by operation plant employees in cooperation with its own and external operational divisions. They include emergency exercises (in individual plants + complex 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 the defined plan. The exercises serve for practical training of employees' adequate response to a possible disaster. The aim is also to verify the validity of emergency plans and procedures and improve the knowledge of all participants. If an exercise reveals shortcomings, adequate corrective measures are adopted within the evaluation of the exercise, including setting deadlines for the removal of the shortcomings and designation of persons responsible for implementation of the measures.

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

The safety level of the Group companies is significantly influenced by new investments in production facilities the projects of which are addressed the possible operational risks by the use of generally accepted methods of assessment of the major accident risks. Each new facility is equipped with the most modern safety systems which meet the legal requirements of the Czech Republic and the European Union.

Production Group companies have their own fire brigade with top-level equipment and training. The fire brigade is capable of highly specialized interventions in accidents associated with releases of hazardous substances. Česká rafinérská utilizes the services of the Unipetrol RPA (Litvínov) fire brigade and the Synthos (Kralupy nad Vltavou) fire brigade.

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

On the basis of the recommendations issued by reinsurers, Unipetrol RPA launched a project aimed at processing HAZOP studies for all production sites in 2014, the project was concluded in 2016.

Within the preparation of the project documentation for the planning procedure of the new PE3 production plant of Unipetrol RPA the Risk analysis and assessment for this new plant has been drawn up.



## Overview of classification of companies into groups according to the Act No. 224/2015, as amended, and the state identified in the Safety report of December 31, 2016

Company	Groups	Safety report
Unipetrol RPA	B	SR update is currently undergoing the approval process / Regional Authority of the Ústí Region
Unipetrol Doprava - Operating department, Pardubice facility, Semtín, Railway facility Pardubice	B	The SR update is in approval process / Regional Authority of the Pardubice Region
Unipetrol Doprava - Operating department, Pardubice facility, Semtín, Railway siding Semtín	B	The SR update is in approval process / Regional Authority of the Pardubice Region
Unipetrol Doprava - Operating department, Railway siding Litvínov	B	The SR update is in approval process / Regional Authority of the Ústí Region
Unipetrol Doprava - Operating department, Kralupy facility, Neratovice, Railway facility Kralupy	B	The SR update is in approval process / Regional Authority of the Central Bohemia Region
Unipetrol Doprava - Operating department, Kralupy facility, Neratovice, Railway facility Neratovice	B	The SR update is in approval process / Regional Authority of the Central Bohemia Region
Česká rafinérská		
Litvínov refinery	B	The SR update is in approval process / Regional Authority of the Ústí Region
Kralupy refinery	B	The SR update is in approval process / Regional Authority of the Central Bohemia Region
Paramo, cost centre Pardubice	B	The SR update is in approval process / Regional Authority of the Pardubice Region
Paramo, cost centre Kolín	-	Not subject to the Act No. 224/2015. Report on the non-inclusion according to the law was updated and submitted to the Regional Authority.
Benzina	-	Not subject to the Act No. 224/2015 Coll. Report on the non-inclusion FSs according to the law was updated and submitted to the Regional Authority.

## 5.2. Transport Information and Emergency System TIES

Transport Information and Emergency System (TIES) is a system providing help in accidents associated with the transportation of hazardous substances. TIES 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. TIES is similar to the British system CHEMSAFE, for example, or the German TUIS, which served as the model for building TIES. Similar systems were implemented also in the Slovak Republic (DINS), Hungary (VERIK) and they have also been utilized in many EU countries.

TIES centres provide (in cooperation with the Fire Brigade of the Czech Republic) 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 with emergency situations associated with their transport. TIES centres provide also practical assistance in liquidation of emergency situations, such as removal of the subsequent environmental damage.

There are currently 22 regional centres TIES in the Czech Republic. The centres are provided by 35 companies operating in the chemical industry. Unipetrol companies are founding members of TIES. Moreover, Unipetrol RPA acts as the national coordination centre.

### Overview of Unipetrol Group companies participating in TIES

Company	Participation in the emergency system TIES
Unipetrol RPA	National Centre, Regional Centre reporting and ensuring the operation of the whole system at the national level
SPOLANA	Centre No. 4



### 5.3. Serious accidents in Unipetrol Group in 2016

In 2015, an accident, classified as serious, happened on the Unipetrol RPA steam cracker unit. This accident was announced in accordance with legislative requirements and a written report on the occurrence of a serious accident was delivered to the regional office within 24 hours. Furthermore, a final report draft on the occurrence and impact of a serious accident was prepared and submitted. Investigations carried out by the Czech Police were not concluded by the end of 2016.

On the date of this annual report, we do not have confirmation that in 2016 any accident classified pursuant to Act No. 224/2015 Coll. occurred in any of Unipetrol Group companies .

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

# VI. Open approach to environmental issues

## 6.1. Role of employees in environmental protection

Unipetrol Group employees are considered the key bearers of environment, occupational health and safety, and fire protection activities. Therefore, the individual companies have implemented effective training systems for all employees. Training and education of employees is part of the established management systems. It is subject to regular reviews, evaluations and completions in terms of 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 with policies in the areas of environmental protection, health and safety protection, fire protection, environmental aspects of their activities, and the objectives and programmes defined for their workplaces at regular reconconditioning trainings.

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

Active role of employees is also supported by a newly introduced IDEA platform through which the Group employees are encouraged to send their own ideas that help meet and improve Unipetrol's goals, including the HSEQ area.

## 6.2. Communication with the public

Information openness is one of the principles of the "Policy for Responsible Business in Chemistry and Integrated System of Occupational Safety and Health, Environmental Protection and Quality Management" of Unipetrol Group, which is the basic policy document of the Group.

Detailed information on the status and development of effect of the Group's activities on the environment are regularly published in the "Joint Report on Health, Safety and Environmental Protection in Unipetrol Group" (until 2006 it was the "Joint Environmental Report") and on the Group's website.

The selected companies publicly discuss their reports on implementation of the "Responsible Care" programme with representatives of trade unions, local and regional authorities. An overview of their activities in the field of environmental protection and health and safety protection can be found on the website of Unipetrol Group.

Unipetrol Group companies apply corporate social responsibility principles (CSR) to the towns and villages in their vicinity. Part of the cooperation with the public is informing about the company's impact on the environment in the area through the participation of representatives of Unipetrol's management in public sessions of councils of the neighbouring municipalities. The companies organize "Open Days" for the public. Representatives of the companies hold regular meetings with the mayors during which the participants are familiarized with all activities, including environmental protection. When a non-standard operating situation occurs, mayors of neighbouring municipalities are preventively immediately informed. The need for immediate communication with the public and employees of companies is met via a "green line". Employees are informed through internal communication sources (radio, printed materials, intranet). The Police of the Czech Republic and the Litvínov and Most Municipal Police are connected online to receive alerts by the company alarm system in Chempark Záluží. Unipetrol RPA company also wants to assist in informing the public located in the emergency planning zone and its surroundings about the occurrence of a major accident in its production units and therefore in 2016, it signed an agreement on mutual cooperation with the cities of Litvínov and Most with the aim of sending emergency SMS via the information channel. These crisis SMSs are a complementary element to a well-established and functioning alert and warning system and should facilitate informing the general public of major accidents, recommended behaviour and possible restrictions on the movement of persons and material in the Emergency Planning Zone and its immediate vicinity.

Another example of active openness of information in the field of environmental protection is the Environmental Centre Most which has been created in 2000 with the support of Unipetrol RPA and Česká rafinérská. The centre contributes significantly to the dialogue on environmental protection between companies and the general public, it also ensures cross-border communication with the neighbouring Saxony. In 2007, the Environmental Centre was created in Kralupy nad Vltavou. It performs similar functions for the Kralupy region.

In 2007, the Environmental Centre Most participated in completion of a training programme project "Chemistry and the Environment" aimed at educating primary and secondary school students. The primary aim of the project was to popularize environmental protection issues in relation to chemical production, present the positive and negative aspects of chemical production and present activities of Unipetrol RPA in the area of environmental protection. The project had a very positive response from schools and therefore, on the basis of the schools' interest, it continued also in 2008. In 2011, the Environmental Centre Most participated in preparation of an interactive educational programme "Journey to the secret oil" for elementary and secondary schools. Česká rafinérská together with UCT and other partners operate the information portal Petroleum.cz which contains extensive information on oil and oil products and impacts on the environment. The information is intended for the general public.

# VII. Mitigation of effects of old environmental burdens

## 7.1. Programme of old environmental burdens elimination

Based on the privatization-related decision of the Government of the Czech Republic, Unipetrol Group companies entered into the following agreements on solving ecological commitments incurred before the privatization (Ecological Agreement):

- 1) Ecological Agreement No. 14/94, as amended by the amendment 3 on January 25, 2005, entered into by Unipetrol
- 2) Ecological Agreement No. 32/94, as amended by the amendment 1 on July 4, 2001, entered into by Unipetrol
- 3) Ecological Agreement No. 39/94, as amended by the amendment 2 on July 4, 2001, entered into by Paramo
- 4) Ecological Agreement No. 58/94, as amended by the amendment 3 on September 26, 2008, entered into by Paramo
- 5) Ecological Agreement No. 184/97, as amended by the amendment 7 on January 18, 2007, entered into by Benzina

## 7.2. Overview of old environmental burdens in Unipetrol Group

There were no changes in the extent of old environmental burdens in 2016 compared to the previous period with the exception of Milečice u Velvar locality on the route of the ethylbenzene pipeline Litvínov–Kralupy, where groundwater monitoring was completed and where compliance with the conditions of the decision of the Czech Environmental Inspectorate (CEI) was officially confirmed. Below is an overview of Unipetrol Group's old environmental burdens.

### Unipetrol, Litvínov

Litvínov industrial complex and the surrounding landfills

- Liquid sludge landfill Růžodol
  - pollution by tar residue and waste from oil refining
- Ash dumps K1-K4
  - remediation of ash dumps K1 and K2 was completed
  - remediation works are halted due to priorities of the Ministry of Finance of the Czech Rep.
- Sewage treatment plant sludge dump
  - remediation works were completed
- Protection of River Bílina in the area of the sewage treatment plant dump
  - remediation works were completed
- Intercepting and separator drain Růžodol
  - the system build, operation running
- Solid industrial waste landfill, lime sludge landfill II, lime sludge landfill at the siding
  - pollution by solid waste, oil products, and lime sludge with phenols
  - remediation works are halted due to priorities of the Ministry of Finance of the Czech Rep.
- Uhlodehta landfill
  - pollution by coal slack, ash, fly ash, lime sludge, and lignite tars
  - remediation works are halted due to priorities of the Ministry of Finance of the Czech Rep.
- Ash dump south foreland
  - pollution by ash and sludge oil,

- oil sludge was drawn and removed
- remediation works are halted due to priorities of the Ministry of Finance of the Czech Rep.
- Remediation of groundwater in the contamination clouds in the complex
  - pollution of groundwater by petroleum hydrocarbons and phenols
- Groundwater monitoring
- Remediation of soil in the complex as part of ecological services within investment projects
  - pollution of soil by petroleum hydrocarbons and phenols
- Remediation of block 32
  - pollution of soil and groundwater with petroleum hydrocarbons and phenols

## **Unipetrol, Kralupy**

- Block 19 (goudrons)
  - acidic residues from the process of refining gasoline
  - the "goudrons" remediation feasibility study was presented and approved
  - CEI issued a decision to rehabilitate the location
  - remediation works are halted due to priorities of the Ministry of Finance of the Czech Rep.
- Nelahozeves landfill
  - styrene residues stored in steel barrels
  - AAR addendum was drawn up
  - CEI issued a decision regarding changes to the deadline for completion of remediation and implementation of the "preremediation monitoring"
  - the "preremediation monitoring" and preparation for the remediation contractor tender took place
- Industrial complex in Kralupy
  - contamination by refinery and petrochemical products
  - the final draft of the "Supplement No. 1 to the updated risk analysis of the industrial complex in Kralupy nad Vltavou" was drawn up
  - the protective remedial pumping of the contamination cloud E took place

## **Benzina**

- Remediation of 58 contaminated areas pertaining to filling stations
  - contamination by motor fuels
- Remediation of 13 contaminated areas of the former fuel distribution warehouses
  - contamination by motor fuels

## **Paramo, Pardubice**

- Landfill in Časy
- Hlavečník and Nová Ves landfills
- The main plant of Paramo and its surroundings
- Acid resin landfill (LIDL, ČSAD BUS area)

## **Paramo, Kolín (former Koramo)**

- Remediation of soil and groundwater
- Liquidation of acid resin repository (rhododendron lagoon)



## 7.3. The course of remedial works in 2016

The following remedial work was carried out in 2016 within the scope of the old environmental burdens (OSEZ) removal.

### Unipetrol, Litvínov:

Plant's premises:

- Groundwater remediation was performed in 5 areas of contamination clouds (hereinafter referred to only as CC) in plant's premises. Extraction from underground drains was performed in 5 areas of the CC.
- Subsequent hydrogeological surveys were carried out on four CC.
- The inspection of the CEI the CC No. 1, 6 and 10 were taken over from the contractor, the others will be taken over gradually.
- Monitoring (ecological service) and biodegradation of soil extracted under the ongoing investment activities of Unipetrol RPA were carried out.
- Prescribed monitoring was organized.
- Redevelopment of groundwater was carried out under the rehabilitation of block 32, accompanied by exploratory work and pilot experiments of intensification methods of remediation.
- An updated risk analysis was completed and approved.
- An issuance of a new decision by the CEI was organized (postponement of deadlines for implementing corrective measures).

Růžodol liquid sludge dumps:

- Liquidation of lagoons in Růžodol – after-treatment of the surroundings of the former R3 and R4 lagoons continued (operation of the hydraulic remediation system and application of innovative methods of remediation in isolated pollution deposits).
- Contaminated water from the capture and separating drain was pumped to the WWTP.
- Design work on the 2nd stage of the works (reclamation) in the former R3 and R4 lagoons locality started.
- An issuance of a new decision by the CEI was organized (postponement of deadlines for implementing corrective measures).

Ash landfills, including the south forefield (jižní předpolí):

- Protective pumping of contaminated water from the Nová voda střed reservoir continued, the capacity of the pumping station was increased, the project for construction and operation of the hydraulic protection system in the landfill towards 4a was completed, the territorial proceedings started.

Lime sludge landfills:

- The protective remediation of the drainage water of lime sludge continued.

### Unipetrol, Kralupy:

- Monitoring of the underground water quality of the contaminated Cloud E in blocks 14 and 15 (Stage II) took place - 7 rounds of monitoring were performed. A tender called for the Nelahozeves landfill contractor. At the end of 2016, preparatory work was carried out for obtaining the necessary permits, including the site preparatory work.
- 4 rounds of surface and groundwater monitoring took place.

### Paramo, Pardubice/Kolín:

- The protective remediation pumping and monitoring took place at Časy location.
- A re-examination of the local occurrence of sludge at LIDL locality was carried out; a rehabilitation intervention was performed at U Trojice locality, i.e. remedial pumping of the HOPV boreholes and remediation drains.
- A protective drainage of rainwater at Hlavečnick locality was carried out.
- The Ministry of Finance of the Czech Republic adjudicated the tender for the redevelopment of the Paramo Pardubice main plant - Stage 1A and called on the selected contractor to sign a Contract for Work.
- A remediation intervention took place at Nová Ves stock-pile - the collection of petroleum hydrocarbons, including processing of the final report of the remediation.

- Remediation pumping of petroleum hydrocarbons from the rock environment as well as removal of contaminated soils and re-reclamation of sludge lagoons at Kolín economic centre were carried out.

#### Benzina:

- Maintenance remedial works (protective remediation pumping) in distribution stores Nový Bohumín, Šumperk and Točnick. In other locations there is ongoing additional exploration phase, remediation project processing, protective pumping tenders, monitoring or post-remedial monitoring.

#### Other remedial works performed in 2016:

- Pumping and purifying of groundwater financed by Česká rafinérská in Litvínov complex (2 centres of contamination in the area of warehouses and terminal) and in Kralupy complex (deployment of hydraulic barrier).
- Pumping in the block 64 to prevent spreading of aromatics into the Million Canal (Milionový kanál) funded by Unipetrol RPA.

## 7.4. Disbursement of funds in 2016

### Overview of financial guarantees from the Ministry of Finance and disbursement of funds in Unipetrol Group (mil. CZK) as of December 31, 2016

	Unipetrol Litvínov	Unipetrol Kralupy	Paramo Kolín	Paramo Pardubice	Benzina	Spolana	Group total
Financial guarantee by the MoF	6,012	4,244	1,907	1,241	1,349	8,159	<b>22,912</b>
Costs paid by the MoF in 2016	171.7	0.3	97.1	11.8	4.3	2.2	<b>287.4</b>
Costs paid by the MoF since the works started	4,186	51	1,860	524	481 <sup>1)</sup>	5,595	<b>12,697</b>
Expected cost of future works	2,519	789	41	2,750	1,363	1,741	<b>9,203</b>
<b>Total (estimated) remedial costs</b>	<b>6,705</b>	<b>840</b>	<b>1,901</b>	<b>3,274</b>	<b>1,844</b>	<b>7,336</b>	<b>21,900</b>

<sup>1)</sup> Benzina – without the costs of Benzina, spent on remedial works to 1997 in the approximately CZK 500 mil.

# VIII. Sustainable development

## 8.1. Global aspects of environmental protection

### Regulation of carbon dioxide emissions under the EU's scheme for trading in carbon dioxide emission allowances (EU ETS).

The second trading period starting on January 1, 2008 involved stricter conditions for monitoring and reporting greenhouse gas emissions after the expiry of certain exemptions applicable in the first period. The new allocation plan issued in the form of Decree No. 80/2008 for the trading period 2008 to 2012 also allocated allowances to Unipetrol Group companies.

The Group companies, in accordance with the rules of the European Parliament and the Council 2009/29 on trading with allowances for emissions of greenhouse gases within the Community and in accordance with the specific instructions, applied in 2012 through the MoE for allocation of allowances for the period 2013–2020. Most facilities operated by Unipetrol RPA, Česká rafinérská and Paramo fall into the category of "sectors with a risk of carbon leakage". Allocation of allowances should correspond to "benchmarks", if there is no change in the operation, and should be maintained throughout the third trading period. At the end of 2013, the European Commission approved the final amount of the allocation. At the same time, enterprises update monitoring plans in accordance with the new rules and ensured their approval through the Ministry of Environment. New auditors for annual verifications of emissions in the new periods were also appointed.

The third trading period started in 2013. The period will last until 2020. There was a significant increase in the number of monitored sources of CO<sub>2</sub> emissions in the third period. The method of calculating, monitoring, and reporting of CO<sub>2</sub> emissions also changed. The calculation of allocation of free underwent a significant change as well.

### Allocation of allowances to Unipetrol Group companies according to the National Allocation Plan for the periods 2005–2007, 2008–2012, 2013–2020 and actual CO<sub>2</sub> emissions between 2005 and 2016

#### Allocation of allowances (thous. pcs.)

Actual emissions (kt/year)	Unipetrol RPA	Česká rafinérská	Paramo	Unipetrol Group
The annual allocation under NAP 2005-2007	3,495	1,100	270	4,865
2005: The real emissions of CO <sub>2</sub>	3,071	803	194	4,068
2006: The real emissions of CO <sub>2</sub>	3,092	910	196	4,198
2007: The real emissions of CO <sub>2</sub>	2,889	904	191	3,984
<b>The annual allocation under NAP 2008-2012</b>	<b>3,121</b>	<b>867</b>	<b>199</b>	<b>4,187</b>
2008: The real emissions of CO <sub>2</sub>	2,762	910	176	3,848
2009: The real emissions of CO <sub>2</sub>	2,558	806	172	3,536
2010: The real emissions of CO <sub>2</sub>	2,468	883	170	3,521
2011: The real emissions of CO <sub>2</sub>	2,136	835	148	3,119
2012: The real emissions of CO <sub>2</sub>	1,944	856	95	2,895
<b>The total allocation for the period 2013-2020</b>	<b>10,159 <sup>1)</sup></b>	<b>6,494</b>	<b>445</b>	<b>17,333</b>
2013: The real emissions of CO <sub>2</sub>	3,062	772	47	3,881
2014: The real emissions of CO <sub>2</sub>	3,138	877	37	4,052
2015: The real emissions of CO <sub>2</sub>	2,841	888	36	3,765
2016: The real emissions of CO <sub>2</sub>	2,491	678	37	3,206

<sup>1)</sup> In the period 2013-2020, there was a significant increase in the number of GHG sources included in the EU ETS. The allocation may further change due to changes in the operation of facilities.

Based on the 2016 emission calculations, we can say that the allocated annual number of allowances allocated in Unipetrol RPA covers ca 66% of annual emissions. The increase in the proportion of allowances covered by allocation in 2016 compared to 2015 was due to a nine-month outage of the steam cracker and decrease in production of other plants. Allocation for the next year will be used for covering the allowance deficit in 2016; the remaining deficit will be covered by the purchase. Paramo has long been running a significant surplus of allowances from previous allocation periods. The drop in CO<sub>2</sub> emissions in 2016 reported by Česká rafinérská was caused by the limited operation of Kralupy refinery and the planned turnaround of Litvínov refinery. As a result of lower use of steam cracker, there will be a partial reduction of unallocated allowances of Unipetrol RPA in 2017.

### **Protection of the ozone Layer**

All the Group companies operate their production facilities in accordance with the requirements for the ozone layer protection and in accordance with applicable international agreements. Česká rafinérská already stopped using halons in fire protection system and implemented environmentally friendlier solutions in 1999. Chemopetrol (today Unipetrol RPA) already replaced refrigerants used in low-temperature petrochemical operations with environmentally friendlier fillings in the previous years.

The original refrigerant consisting of partially halogenated chlorine-containing refrigerant used in the cooling unit of the C<sub>4</sub> fraction was replaced by an environmentally friendlier chlorine-free refrigerant.

## **8.2. Chemical safety**

All the Group companies manufacture or use chemicals and mixtures in accordance with the applicable Chemical Act and with the Regulation (EC) No. 1907/2006 (REACH). They classify their marketed chemical products in accordance with the Regulation (EC) No. 1272/2008 (CLP) and for those that exhibit hazardous properties, they process safety data sheets which are then provided for free to all purchasers.

At Unipetrol RPA, safety data sheets of manufactured and purchased hazardous chemicals and mixtures are available, in accordance with the REACH regulation, to all employees via the intranet computer network. Česká rafinérská makes available the safety data sheets of manufactured products on the corporate intranet network in the EDMS system. For its processors and shareholders, it runs an extranet portal on which security data sheets are available in three language versions.

The Group constantly pays close attention to communication in the supply and demand chains, which is the basis for the implementation of measures to protect employees' health and the environment when using hazardous chemicals alone or when contained in mixtures. It monitors and puts into practice the changes that occur as a result of refining the processes related to the registration and classification of chemical substances, and it reflects them in updating its safety data sheets. The Safety Data Sheet processors take part in regular training so that they meet the professional competence required. Last but not least, the company is continually fulfilling the requirement of the REACH - to keep the registration dossier up to date, so they must ensure that their IUCLID software application, which processes the technical documentation for registered and notifiable substances, is in line with the latest version published on the ECHA website.

All the companies continuously monitor handling of chemical substances and mixtures from raw materials to finished products and ensure compliance with applicable laws, including internal and external testing and subsequent issuance of legal statements for specific applications of selected products – e.g. for contact with food, drinking water, for medical use etc. The companies have customer service that provides detailed information about the characteristics of the products in relation to their specific use.

The Group companies are subject to international inspection of the United Nations (UN-OPCW) which monitors the observance of the "Convention on the Prohibition of Chemical Weapons". All the previous checks carried out by state authorities and international inspections in the Group companies showed a thorough fulfilment of the "Convention".

### **Fulfilment of current obligations under the Regulation (EC) No. 1907/2006 (REACH)**

Unipetrol companies that produce or import chemical products had to register, in accordance with the REACH Regulation, altogether 63 chemical substances.

The submitted registration dossiers are also subject to further control processes by ECHA. In addition to the decision to carry out subsequent tests on high volume products, ECHA selects, on the basis of IT screening, chemical substances to check their complete documentation submitted in order to evaluate completeness of compliance with the REACH regulation requirements (compliance check), to evaluate chemical substances themselves within Rolling action plan (CoRAP), or to set down the measures at EU level (restriction, permission). When detecting a discrepancy or insufficient quality of the data examined, ECHA will issue a decision on completion of the data. Failure to comply with the decision will be forwarded by the Agency to the further solution to the relevant national authority responsible for the asserting of regulations.

The following products of Unipetrol Group were included into mentioned control processes:

- soot:  
Compliance check - ECHA has issued a draft decision on adding nano-materials identification data and tests; however, the entire process has been suspended in the meantime due to uncertainties surrounding the obligation to provide special data for nano-forms;  
CoRAP - carbon blacks were classified because of suspected carcinogenic properties; the draft decision is expected in the second half of 2018.
- naphthalene concentrate:  
Compliance check - ECHA acknowledged the lead registrant's argument and withdrew its request to perform reproductive toxicity tests;  
CoRAP - naphthalene was classified due to a mismatch between the general and German exposure limits. Last year, the evaluating country, the UK, issued a draft decision, currently without any further procedure given.
- SDA desulphurization product:  
ECHA issued a decision on performing follow-up tests (mutagenicity, reproductive toxicity, harmful effects for the environment) with a deadline of December 2018. It was decided that testing should start in the first half of 2017, with the expected completion in the spring next year, followed by the preparation of a dossier for submission to ECHA.
- MTBE:  
MTBE was included in CoRAP due to high aggregate tonnage and wide dispersed use. During the evaluation, concerns about biodegradability and persistence were added. According to ECHA the information in the dossier as well as in the subsequent update of the dossier is still insufficient. ECHA requires the ES are reworked and as a point of departure an assumption is made that the substance is not degradable.

In accordance with the current legislation, Paramo implemented the necessary registrations of substances and isolated intermediates in due course. In the course of 2016, in cooperation with the CONCAWE consortium, active registered substances were updated and the intended uses in the CSR were clarified. Registration documents were updated in given categories. Safety data sheets of substances and mixtures are updated as necessary and supplemented by exposure scenarios. In addition, a project was implemented to verify the compliance of handling of hazardous substances with the requirements specified in the exposure scenarios during their industrial use in production. Communication with customers was renewed in connection with the possible inclusion of Triumf substances (EINECS 265-103-7) among the SVHC substances so as to find out possibilities of future deliveries of these Paramo products. Paramo continues to serve as the main registrant within SIEF for "Lubricating oils" substance – EC 278-012-2 with all the associated obligations.

All the companies continue to pay great attention to communication in the supply chains, which is the basis for implementation of measures to protect workers' health and environmental protection measures when using hazardous chemicals alone or in mixtures. The companies monitor and apply in practice the changes that occur as a result of refining the concepts and processes associated with the registration and classification of chemicals and they reflect the changes when updating their safety data sheets. Last but not least, the companies continuously fulfil the requirement of REACH – continuously update registration dossiers and therefore they must also ensure that their software application IUCLID, in which the technical documentation for both registered and notified substances is processed, is in line with the latest version published on ECHA website.

### 8.3. Management of primary sources of raw materials and energy

Regarding the savings of primary sources of raw materials and energy, Unipetrol Group adheres to principles of sustainable development and focuses its basic strategy on innovative approaches that lead to the minimization of energy and material inputs and promotes continuous improvement in environmental performance and increasing energy efficiency. Companies of the group in which a successful energy management system certification pursuant to ISO 50001 has been implemented have committed themselves to these principles within the framework of the Energy Policy.

Several Group companies have undergone energy audits in order to achieve further energy savings.

The following projects were carried out in Česká rafinérská as part of the 2016 turnaround in Litvínov:

- replacing the air preheating in VD PSP furnace – reducing furnace operation energy intensity;
- replacing the internals in the VD PSP column – reduction of the pressure differential of the column and increase in the energy efficiency of the operation unit;
- modifications to ŠJ PSP, CCR and Claus units related to increasing the reliability of operation of these units.



In coordination with Unipetrol RPA, solutions regarding the operation optimization for both companies when using clean and wastewater are implemented. The functionality of steam traps continues to be monitored regularly.

Significant savings are achieved through better use of primary materials. For example, Česká rafinérská implemented an extensive modernization programme the aim of which was to deepen processing of crude oil in favour of "light products", particularly motor fuels.

In Česká rafinérská, Litvínov refinery, a project of reconstruction of air preheating units on atmospheric-vacuum distillation units and the hydrotreating chamber 5/6 was implemented. The project increased the efficiency of furnaces and reduced fuel consumption and costs of heating the pipeline branches. The compliance with the operating parameters defined for the individual operating units to optimize energy consumption and utilities was examined in both refineries. Investment projects for the period 2014-2018 are being prepared in both refineries. The projects are aimed at increasing reliability of the equipment and optimizing the energy performance of production units.

Unipetrol RPA continuously implements diverse investments and technological changes that have directly or indirectly resulted in reduced consumption of energy, raw materials, and production of waste and wastewater, as well as a re-use of by-products or raw materials etc. in the operator's facilities.

Among the most significant investment activities in order to reduce energy consumption is a project of higher control implementation (APC) on the Heating oil gasification unit (POX) with benefits in medium and low pressure steam saving. The systems of higher control will be implemented gradually. Unipetrol RPA also aims on the reduction of energy losses from pipeline systems. This is primarily an extensive replacement of pipeline insulation and its monitoring as well as the preparation for the building heating project. Another energy-intensive node is gas compression where Unipetrol RPA is focused on improving the compressor control in terms of specific consumption and reducing reached pressures for individual chemical processes.

For the future, the most important things are those activities in the definitions of operational strategy of energy resources, their size and fulfilment of all legal parameters.

A constant attention is paid to water saving in Unipetrol Group. Significant results in this field were achieved especially by Paramo which implemented closed cooling circuits. The newly installed chemical water treatment facility in Paramo leads to reduction in the amount of leach and thereby to reduction of additional water consumption.

In the field of energy efficiency reduction, Paramo has been implementing projects contributing to the reduction of steam consumption used for product heating and pumping routes (using heat from its own steam generated at the incinerator for the 'Asfalty' operation). The optimization of the lengths of the steam processing routes (reduction of heat loss in the pipeline) and the installation of the thermal insulation in selected tanks is also being implemented.

#### Water consumption in the Group (mil. m<sup>3</sup>/year)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	22.2	24.5	23.0	22.0	20.0	19.4	21.4	17.8	16.8	14.3
Česká rafinérská	1.7	1.8	1.8	2.9	2.7	2.8	2.7	3.0	2.9	2.3
Paramo	1.0	1.0	1.0	1.0	1.0	0.7	0.5	0.3	0.3	0.3
Unipetrol Group	24.9	27.3	25.8	25.8	23.7	22.9	24.5	21.1	20.0	16.9

The stabilized energy consumption in Unipetrol Group is accompanied by a significant growth in production volumes. Development of production process energy efficiency can be therefore better seen in the following table of specific energy consumption. The 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	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	5.3	4.8	9.8	10.1	9.4	9.9	8.8	8.4	8.6	7.9
Česká rafinérská	13.6	16.8	16.6	14.6	12.6	13.7	16.1	16.8	16.7	14.0
Paramo	2.7	2.7	2.6	2.4	2.9	1.8	1.0	0.9	0.8	0.8
Unipetrol Group	21.6	24.3	29.0	27.0	24.9	25.4	25.9	26.1	26.1	22.7

Note: Paramo's data for 2004 and 2005 without the former Koramo

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

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	0.159	0.153	0.163	0.163	0.166	0.163	0.166	0.145	0.189	0.291
Česká rafinérská Litvínov	0.035	0.032	0.034	0.049	0.053	0.043	0.047	0.043	0.047	0.050
Česká rafinérská Kralupy	0.056	0.057	0.053	0.058	0.056	0.057	0.060	0.055	0.054	0.062
Paramo EC Pardubice	0.087	0.086	0.097	0.106	0.115	0.151*	0.202	0.124	0.133	0.147
Paramo EC Kolín	<b>0.297</b>	<b>0.221</b>	<b>0.355</b>	<b>0.333</b>	<b>0.245</b>	<b>0.221</b>	<b>0.227</b>	<b>0.184</b>	<b>0.225</b>	<b>0.240</b>

\* Oil processing was shut down in Q2 2012 – the value thus lacks continuity with data between 2004 and 2011.

# IX. Occupational safety and health at work and fire protection

Unipetrol Group considers occupational safety and health at work and fire protection as one of the priorities of its policy.

The unfavourable development of industrial accidents in 2015 saw a positive turnaround and the results of the work-related accident rate was considerably more favourable in 2016. Set targets were met in the areas of monitored work injuries and other emergencies. A positive result was achieved despite the implementation of shutdowns and execution of large investment projects (recovery of ethylene unit, construction of polyethylene unit 3, demolition of the heating plant 200), connected with a large number of external suppliers and mechanization in industrial premises.

Unipetrol RPA successfully integrated into its structure these companies and organizations: Benzina, Polymer Institute Brno and Unipetrol Services. It also unified the safety management system. The unification of reported indicators within Unipetrol Group and the project for the standardization of selected safety areas within PKN Orlen has begun. Last year, individual independent projects aimed at enhancing the functionality of the safety system (Motivation and Management of External Contractors, LSR and Consequence Management, LOTO etc.) also started and were implemented.

The development of work-related injuries in Unipetrol Group can be seen in the summary table below.

## The frequency of accidents in Unipetrol Group (a number of injuries per 100 employees)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	0.27	0	0.24	0.26	0.06	0.06	0.19	0.13	0.66	0.16
Česká rafinérská	0.3	0.14	0.45	0.15	0	0.16	0.16	0.32	0.33	0.19
Paramo	0.49	0.39	0.28	0.3	0.92	0.17	0	0	0	0
Benzina	0	0	0	0	0	0	0	0	0	-
Unipetrol Doprava	0.81	0.41	0.22	0.46	0	0	0.24	0.24	0.73	0.50

## The frequency of occupational accidents (a number of accidents/mil. of hours worked)

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	1.71	0	1.45	1.53	0.33	0.36	1.15	0.78	3.99	0.98
Česká rafinérská	1.7	0.8	2.8	0.89	0	0.9	0.89	1.84	1.87	1.01
Paramo	2.94	2.31	1.65	1.74	5.39	2.02	0	0	0	0
Benzina	0	0	0	0	0	0	0	0	0	-
Unipetrol Doprava	4.54	2.25	1.18	2.42	0	0	1.36	1.35	3.75	2.56

## The number of fatal accidents

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	0	0	0	0	0	0	0	0	0	0
Česká rafinérská	0	0	0	0	0	0	0	0	0	0
Paramo	1	0	0	0	0	0	0	0	0	0
Benzina	0	0	0	0	0	0	0	0	0	0
Unipetrol Doprava	0	0	0	0	0	0	0	0	0	0



## The number of registered occupational accidents

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	13	10	14	14	7	8	6	8	32	13
Česká rafinérská	10	3	4	7	4	4	3	8	9	6
Paramo	14	8	3	2	13	5	4	1	0	4
Benzina	0	0	0	0	0	0	0	0	0	-
Unipetrol Doprava	11	9	1	8	3	2	1	2	3	5

## The number of occupational accidents resulting in more than three-days incapacity for work

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	6	0	5	5	1	1	3	2	10	3
Česká rafinérská	2	1	3	1	0	1	1	2	2	1
Paramo	4	3	2	2	6	1	0	0	0	0
Benzina	0	0	0	0	0	0	0	0	0	-
Unipetrol Doprava	4	2	1	2	0	0	1	1	3	2
Unipetrol Group	16	6	11	10	7	3	5	5	15	6

## The number of new cases of occupational disease

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Unipetrol RPA	1	1	0	0	0	0	0	0	0	0
Česká rafinérská	0	0	0	0	0	0	0	0	0	0
Paramo	0	0	0	0	0	0	0	1	1	0
Benzina	0	0	0	0	0	0	0	0	0	0
Unipetrol Doprava	0	0	0	0	0	0	0	0	0	0

## Prevention and personal protective equipment

Prevention of occupational safety is ensured by employees qualified in risk assessment who carry out inspections of individual workplaces. Personal protective equipment is issued to company employees on the basis of hazard identification and the assessment of possible threats to life and death.

## The quality of the work environment

On the basis of categorization of works, working conditions in Unipetrol Group companies are regularly checked by measuring work environment factors, especially the exposure of workers to noise, chemicals and dust.

## Health care and prevention

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

# Important milestones of Unipetrol Group in 2016 from the perspective of environment, health and safety protection

## Unipetrol RPA

- On 1 June 2016, all safety documentation was updated in accordance with the requirements of Act No. 224/2015 Coll., on the prevention of major accidents.
- In 2016, a cooperative emergency exercise was carried out in cooperation with the Fire Brigade of the Regional Authority of the Ústí Region.
- Signing of an agreement on mutual cooperation with the cities of Litvínov and Most with the aim of sending emergency SMS messages through the information channel, which is an additional element of the already established and functional notification and warning system, should enable the general public to be informed of major accidents, recommended behaviour and possible restrictions on the movement of persons and material in the Emergency Planning Zone and its immediate vicinity.
- During 2016, Unipetrol RPA requested issuance of a total of thirteen non-substantial changes to integrated permits.
- Reconstruction project of pyrolysis heaters was carried out.
- The ongoing preparatory phase for the implementation of projects to reduce air emissions from the T700 heating plant and the ethylene unit energy block was commenced so that the facility can meet the stricter emission limits set by the current legislation after the end of the transitional national plan in mid-2020.
- Continuing cooperation with the Czech Fishing Union on increasing fish population in the River Bílina.
- Active participation in the consultation process to the new legislation of the Czech Republic and the EU and related documents (e.g. BREF documents for large combustion plants, large-scale production of organic substances and wastewater and gas purification, amendment to the law on the prevention of major accidents, amendment to the law on the assessment of environmental impact and related methodologies, and others).
- Extension of validity of the permit to collect surface water until December 31, 2040.
- Extension of the permit to discharge wastewater into surface water until June 30, 2019.
- Successful certification of the energy management system according to ISO 50001:2011 (incl. Benzina Registered Branch/odštěpný závod Benzina).

## Unipetrol Doprava

- On June 1, 2016, all safety documentation was updated in accordance with the requirements of Act No. 224/2015 Coll., on the prevention of major accidents.
- The company performed emergency drills the aim of which was to verify the functionality of the internal emergency plan pursuant to the Act No. 224/2015 Coll., on the prevention of major accidents in all plants. The drills were performed in cooperation with fire brigades of the owners of complexes.



## Benzina

- On June 1, 2016, all the non-inclusion reports were updated in accordance with the requirements of Act No. 224/2015 Coll., on the prevention of major accidents.
- Filling station Čáslav: the final report on remediation submitted, the post-remedial monitoring launched.
- Filling station Stod: soil and groundwater remediation implemented from Benzina's funds as part of the filling station renovation; the final report on soil remediation approved, the proposed scope of post-remediation monitoring approved.
- Filling station Tachov: the final KD took place, completion of works approved.

## Česká rafinérská

- On June 1, 2016, all safety documentation was updated in accordance with the requirements of Act No. 224/2015 Coll, on the prevention of major accidents.
- In 2016, the changes of the integrated permits were issued for Litvínov and Kralupy Refineries. The changes implemented the requirements of the Act No. 201/2012, on air protection and some requirements of the Act No. 76/2002, on integrated prevention.
- In 2016, the changes in the integrated permits were issued for Litvínov and Kralupy Refineries which implement the requirements of European legislation in the field of so-called Best Available Techniques BAT.
- The areas requiring implementation of measures ensuring compliance with the requirements of the Best Available Techniques BAT in both refineries were identified and relevant projects were initiated.
- In Kralupy plant there was an ongoing operation of the extended hydraulic barrier the result of which was a further decrease in groundwater pollution.
- A two-year trial operation was launched after completing the project of reconstruction of the wastewater treatment plant in Kralupy refinery. The wastewater treatment plant will ensure achievement of the parameters corresponding to the best available technologies.
- Successful certification of the energy management system according to ISO 50001:2011.

## Paramo

- Successful recertification audit LRQA related to meeting the requirements of ISO 14001, ISO 9001 and OHSAS 18001.
- Completion of the H29.705 C tank reconstruction (receiving MN through pipeline) and VR43 tank reconstruction in Po2 operation (economic centre Pardubice).
- Reconstruction of 563 and 564 tanks in the operation of oils (RDH – economic centre Kolín).
- Ongoing negotiations with the Ministry of Finance on initiation of the remediation phase 1.A in Paramo Pardubice main plant and completion of remediation in economic centre Kolín.
- Scrutiny of conditions of integrated permits with regard to meeting the requirements of the Best Available Techniques (REF BAT) in economic centre Pardubice and Kolín.
- Update of the safety report, internal emergency plan and physical protection plan.
- Exchange of the existing solvent cresol that was used in selective refining in economic centre Paramo Pardubice for a greener solvent N-Methyl 2-Pyrrolidone.
- Cleaning of the stream bed of the Jesečanský Stream flowing through the premises of Paramo EC Pardubice.
- Installation of a ground flare – BA warehouse safety element (in operation Q2/2017).

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