Pražské vodovody a kanalizace, a.s. in 2018

Snapshot

BACKGROUND:

Pražské vodovody a kanalizace, a public company limited by shares (PVK), is the legal successor of the state-owned enterprises Pražské vodárny and Pražská kanalizace a vodní toky to the extent specified in the privatisation proposal.

COMPANY NAME:

Pražské vodovody a kanalizace, a.s.

SHAREHOLDERS as at 31 December 2018

VEOLIA CENTRAL & EASTERN EUROPE S.A.	51%
Pražská vodohospodářská společnost a.s.	49%

INCORPORATED:

1 April 1998

LEGAL FORM: Public limited company (*akciová společnost*)

COMPANY NUMBER:

25656635

SHARE CAPITAL:

CZK 483,288,000

REGISTERED OFFICE:

Ke Kablu 971/1, Hostivař, 102 00 Praha 10

The Company has no subsidiaries outside the Czech Republic. The Company holds no treasury shares.

Executive management

Petr Mrkos, CEO Petr Slezák, Deputy CEO, Chief Personnel Officer Pavel Novotný, CFO and Sales Director Marcela Dvořáková, Chief Communications and Marketing Officer Petr Kocourek, Chief Operating Officer Petr Sýkora, Chief Technical Officer

Key figures

The Company's turnover: CZK 7.545 billion

Profit: CZK 517,759,000

Number of employees: 1,065

Water supplied to the water supply network: 97,746,000 m³

Total wastewater treated: 106,784,000 m³ (of which 97,498 at the CWWTP and BWWT, the remaining volume at the New Water Line)

Length of the water supply network operated, including supply pipes: 4,402 km

Length of the sewerage network operated, including drain pipes: 4,693 km

Number of contract customers: 91,408

Number of people supplied: 1.3 million in Prague and 206,000 in the Central Bohemian Region

Highlights of 2018

PVS became a shareholder of **PVK**

Pražská vodohospodářská společnost a.s. (PVS) became a shareholder of Pražské vodovody a kanalizace, a.s. (PVK) on 20 September 2018. The transfer of the securities to PVS, which paid CZK 1.754 billion for 49% of PVK's shares, was then completed. The City of Prague has founded PVS primarily for the purpose of managing its water infrastructure and it now exercises the shareholder rights in PVK through PVS. The water networks and facilities that Pražské vodovody a kanalizace operates continue to be owned by the City of Prague. In connection with this change, members of the Board of Directors and Supervisory Board have also been changed.

Pražské vodovody a kanalizace started to operate the New Water Line (NWL)

Under the contractual arrangements, Pražské vodovody a kanalizace, a.s. became the operator of the NWL and the new main pumping station of the Central Wastewater Treatment Plant (CWWTP) following the period of trial operation. The first stage of the trial operation was successfully completed before the end of 2018.

The New Water Line (NWL) on the Císařský Island was put into operation on 19 September 2018., It took 35 months to build from the start in 2015. In wastewater treatment, this is currently the largest and most important water management project in the Czech Republic in its modern history. The NWL is completely covered, has a green roof including landscaping, and is equipped with deodorisation. Under the contract award conditions of the investor and owner, the City of Prague, with its modern equipment it is expected, unlike the CWWTP from the 1960s, to provide for a significantly higher efficiency of wastewater treatment, including, without limitation, nitrogen and phosphorus elimination.

Water losses kept at a low level

Water losses amounted to 13.5% in 2018, which was the lowest level ever. This is attributable to the whole system of water supply network monitoring. Monitoring comprises the currently measured

values in the control system for incident indication and the changes in the night-time minimum inflows into the zones for the indication of hidden leakages, as well as continuous data analysis in the leakage monitoring system, including periodical overall evaluations of water losses in water supply zones. In terms of leakages in the water supply network, repairing hidden incidents is the most important measure. Every repaired hidden incident is then analysed and its impact is quantified.

PVK growing stronger in smart solutions

PVK cooperates with the City of Prague in the Smart City scheme; this is a strategic approach to the efficient management of all areas of the city's functioning. PVK also contributes to the drafting of the Implementation Plan for the Strategy of the City of Prague for Adjustment to the Climate Change, which can be felt in the rise of the average daily temperature, the heat island effect, and heat waves. PVK has suggested that the heat island effect can potentially be mitigated by misting; this is an option of local reductions in the temperature at highly exposed sites on the principle of water drop evaporation.

With a view to alleviating the environmental burden, in 2018 PVK continued in energy optimisation projects intended to reduce the consumption of electrical and thermal energy. As part of a new project, SMART energy, the company optimised the control of water pumping into water reservoirs, which constituted another impetus for costs cutting, with a side effect of stabilisation of electricity off-take from the distribution network.

PVK has also joined the Silent City environmental project, the objective of which is to minimise noise and dust levels and reduce emissions from motor fuels in the maintenance of the operated areas.

PVK passed challenging security screening

In 2018, the Company successfully passed national screening conducted by the National Security Office of the Czech Republic, and obtained a Business Certificate. This Certificate provides PVK with access to classified information rated Confidential under Section 20 (1) of Act No 412/2005 (Act on the Protection of Classified Information and on Security Vetting, as amended).

OUR SERVICES

Pražské vodovody a kanalizace, a.s. (PVK) provides comprehensive water management services, reliable supply of high-quality **drinking water**, and **draining and treatment of wastewater** for the City of Prague and the municipality of Radonice. In addition to this core business, the Company also offers a number of other services related to its core business, such as laboratory analyses, network diagnostics, water meter replacement, services downstream of water meters, and many other services for private individuals, housing cooperatives, municipalities, and industrial companies.

The water networks and all water facilities operated by Pražské vodovody a kanalizace are owned by the City of Prague. These assets are managed by the City's Pražská vodohospodářská společnost a.s. (PVS), which is responsible for investments. **Since 20 September 2018, PVS has been a shareholder of PVK; PVS holds 49% of PVK's shares.**

Pražské vodovody a kanalizace, a.s. is the operator of the water management infrastructure and pays rent for its use to the City. Since 2002, when Veolia bought into PVK, **the Company has paid CZK 30 billion in rent**. Veolia, a supplier of water, heat, cooling and electricity in the Czech Republic and elsewhere in the world, holds 51% of PVK's shares. Veolia provides its subsidiaries with know-how in water infrastructure, with which its experience is more than 150 years long.

PVK observes the fundamental values of its shareholder, Veolia: a customer focus, responsibility, solidarity, respect, and innovation. PVK, much like other Veolia Group companies, follows a code of ethics, a code of conduct for managers, an environmental code and an OSH code.

PVK holds internationally recognised certificates for its integrated management system under ČSN EN ISO 9001:2016, ČSN EN ISO 14001:2016, ČSN OHSAS 18001:2008 and ČSN EN ISO 50001:2012. The integrated management system was implemented throughout PVK in 2006 when the Company received a certificate for its quality management system and OHS management system. In the following years, the requirements of environmental management and energy management systems were gradually implemented in the integrated system. In November 2018, the company successfully passed a recertification of all its management systems. The company holds a **Diamond Certificate** from CQS, which commits it to continuously improve in all certified areas of its business.

Drinking water supply and distribution

PVK supplies drinking water to 1.3 million Prague residents and another 206,000 people in the Central Bohemian Region. In Prague and in Radonice, PVK operates the water management infrastructure.

The Company supplies the Prague water supply network with water produced at the water treatment plant the Company operates in Káraný. The Company also purchases drinking water from the water treatment plants in Želivka (operated by Želivská provozní a.s.) and Sojovice (operated by Vodárna Káraný, a.s.), known as "bought-in water", which it distributes in Prague.

The Podolí water treatment plant is a back-up facility in case of emergency. In 2018, 73.5% of drinking water from the Želivka plant was supplied into the Prague water supply network, and the figures were 15.6% from the Káraný plant and 10.8% from the Sojovice plant.

	Indicator	Quantity [m ³]
Drinking water	Drinking water produced by PVK	18,728,593
	Water bought in from the Želivka and Sojovice	93,165,762
	plants	
	Total drinking water	111,894,355
	Water transferred (drinking water supplied into a	15,012,122
	public water supply network managed by another	
	entity)	
Industrial water	Water produced – industrial water mains	863,959
Drinking +	Drinking water and industrial water	19,592,552
industrial	Water for sale supplied to the network	97,746,193

Water supplied to the water supply network in 2018

In 2018, PVK delivered 97,746,000 m³ of water to the water supply network, 0.4% less than in the preceding year. Average per capita water consumption was 107 litres per day.

Percentages of bought-in water, produced water, and industrial water





Water supplied to the water supply network between 2014 and 2018 (in thousands of m³)



Water billed and unbilled between 2014 and 2018 (in thousands of m³)

Water losses

In 2018, the Company was successful in reducing water losses to the lowest ever level of 13.5%. In recent years, water losses have continuously been kept at a low level, but as late as 2000 they still amounted to more than 34%. These modest losses can be put down to the continuous water supply network monitoring, including running evaluations of water losses in supply zones, and regular water system diagnostics. In 2018, PVK checked 3,071 km of the water supply network, 460 km more than in 2017, and found 347 hidden leakages, 19 more than in 2017; detecting hidden leakages is essential for reducing water losses.



Water losses (%) between 2014 and 2018

Length of water supply networks	3,539
Length of supply pipes	863 km
Number of supply pipes	115,011
Number of water meters	113,023
Number of reservoirs	67
Volume of reservoirs	753,494 m ³
Number of pumping stations	51

Water meters

As at 31 December 2018, 112,720 water meters were installed in Prague and 303 in Radonice, i.e. **113,023** in total, to measure drinking water consumption. In 2018, **18,973** water meters were replaced, mostly because the period of the validity of their verification had expired. The repair and verification of 9,202 water meters, **1,193** customer-requested official water meter tests, and **112** on-the-spot official tests were outsourced to an external supplier.

Remote water meter readings between 2014 and 2018



Remote reading is in place for **6,703** water meters. Meter readings are radio-transmitted to a concentrator, from where all data are transmitted directly to end users via the internet. Readings are taken online and the data are stored on a server and immediately presented in the web environment accessible at <u>www.cem2.unimonitor.eu</u> or in the Veolia CEM mobile application.

Remote radio-transmitted readings offer greater user convenience and lower costs per reading, as well as the possibility of monitoring water consumption online and promptly detecting malfunctioning meters. They also guarantee accuracy. In remote readings, PVK works with Pražská teplárenská, a.s., Pražská plynárenská, a.s. and PRE měření.

Water supply network incidents

In 2018, PVK handled 5,208 water supply network incidents, up by 259 incidents, or 5.0% on the preceding year. The average water supply interruption time per incident was 10 hours and 17 minutes. Of the total number of incidents, 45.3% were those on water supply lines and supply pipes and 54.7% on valves and other equipment.

The overall increase in the number of incidents was attributable to the extreme weather in summer, which saw a surge in the number of incidents caused by land movements and soil pressure on pipes due to high temperatures and soil desiccation.

In terms of the impact on the population, incidents are classified as category 1 incidents, where more than 1,000 inhabitants or health or other important facilities are left without a water supply; there were 67 of such incidents, which was only 1.3% of the total number of incidents. There were 158 category 2 incidents and 4,983 category 3 incidents. The leading cause of the incidents was corrosion (70.8%), followed by land movement (24.6%) triggered, for example, by frost. These two causes were responsible for 94% of the cases. The other causes include third-party intervention, material defects, freezing, and others.

It is Company policy to provide maximum information on each incident while minimising the impact on the consumer. Incidents are reported online on the PVK website. This information clarifies whether drinking water supplies are affected at a particular site, where water wagons have been deployed, whether water (including packaged water) has been distributed for emergency supply, and the estimated time it will take to complete the repair and restore normal water supply. All this information is also available via Google Maps. Prague residents who have registered with the text message service also receive news about outages and incidents on their mobile devices.

Number of water supply network incidents repaired between 2014 and 2018



Category 1 and 2 incidents between 2014 and 2018



WASTEWATER COLLECTION AND TREATMENT

Total length of the sewerage network	3,697
Length of drainage pipes	996 km
Number of drainage pipes	123,014
Number of pumping stations	327
Number of wastewater treatment facilities	The Central WWTP + 20 branch WWTPs

In 2018, over 1.28 million inhabitants were connected to the sewerage system in Prague.

The central part of the city has a combined sewerage system in place to drain sewage together with rainwater to the Central Wastewater Treatment Plant (CWWTP) and, since 19 September 2018, also to the New Water Line (NWL). The outskirts of Prague are served by separate sewer networks that drain rainwater separately.

In 2018, PVK also operated 20 branch wastewater treatment plants (BWWTPs) in addition to the CWWTP and the NWL: in Březiněves, Horní Počernice - Čertousy, Dolní Chabry, Holyně, Kbely, Koloděje, Kolovraty, Klánovice, Královice, Lochkov, Miškovice, Nebušice, Nedvězí, Sobín, Svépravice, Uhříněves - Dubeč, Újezd nad Lesy, Újezd u Průhonic, Vinoř and Zbraslav.

From September, PVK was also responsible for the trial operation of the NWL and the main pumping station. The first stage of the trial operation was successfully completed before the end of 2018. In the second stage of the trial operation, the NWL will already keep the contractually required design parameters. The New Water Line is the largest and most important water facility in the Czech Republic; it is owned by the City of Prague. The facility is completely covered by a green roof, including landscaping features, and equipped with deodorisation and its state-of-the-art technology ensures a higher efficiency of wastewater treatment, in particular in nitrogen and phosphorus elimination, than the old CWWTP.

In 2018, PVK treated 97,498,000 m³ of wastewater at the CWWTP and BWWTP; including the NWL, PVK treated a total of 106,784,000 m³ of wastewater, which was 9.3% less than in 2017; of that volume, 90,633,000 m³, i.e. 84.9%, was treated at the CWWTP; 6,865,000 m³, i.e. 6.4%, at the BWWTP; and 9,286,000 m³, i.e., 8.7%, at the NWL.

In statistical terms, the total wastewater inflow was the lowest ever, indicating an extremely dry year with only very little precipitation. In 2018, the requirements for the quality of treated wastewater discharged from the CWWTP were met in full, also under the very taxing conditions, including the building and commissioning of the NWL.

Cogeneration units produced 100% of the thermal energy and 77% of the electrical energy required overall for operating the existing water line and the sludge system of the CWWTP.

The treatment of Prague wastewater at the CWWTP produced 2,260 tonnes of grit (gravel and sand) overall, 3,764 tonnes of screenings, and 77,598 tonnes of dewatered sanitised sludge in 2018. 94% of sanitised sludge was deposited on farmland, 3% was processed in a composting plant, and 3% went to solidification of waste, all of this in line with the applicable provisions of the Waste Act.

	m ³
CWWTP	90,632,600
BWWTP	6,865,317
CWWTP +	97,497,917
BWWTPs	
NWL	9,285,811
TOTAL	106,783,728

Quantity of wastewater treated in 2018 (m³)



r.16

r.17

Total quantity of wastewater treated between 2014 and 2018 (in thousands of m³)

106 784

r.18

Share of wastewater treated in 2018

r.15

r.14

110 000

105 000

100 000



Incidents in the sewerage network

In 2018, PVK employees addressed 3,384 incidents overall in the sewerage network, including those on covers, and blockages, which was down by 259, i.e. 7.1%, on the preceding year. Incidents on supply pipes account for 46% of incidents, taking the single largest share of them.

The most common sewerage network incidents, in terms of the type of damage, involved blockages and sediment, accounting for 75.8%, or 2,565, of the incidents. The number of blockage and sediment incidents was down by 266, or 9.1%, year on year.

Other causes of incidents included missing or damaged manhole covers, damaged restoration liners, destruction, deformations, etc.

Type of facility	Number of incidents	%
Sewers	1,102	32.6
Drainage pipes	1,557	46.0
Shafts, chambers, reservoirs,		
spillways	572	16.9
Other	153	4.5
Total	3,384	100.0

Number of sewerage network incidents by type of facility in 2018

Sewerage network incidents between 2014 and 2018, showing the share of blockages



Equipment breakdowns

PVK tackled 825 equipment breakdowns in total in 2018, i.e. 18 or 2.2% less than in the preceding year.



Number of equipment breakdowns between 2014 and 2018

Sewerage network surveys

Under the operating agreement between PVK and PVS, the Company continuously conducts preventive surveys of the sewerage networks, using camera inspection systems for sewers that cannot be entered physically and visual inspections on foot in tunnels. In 2018, PVK employees surveyed 134 km of sewers and inspected 1,780 access shafts and other installations in the sewerage network. They detected 19 incidents on the sewerage network during the surveys. To repair the defects detected in the sewerage system, they drew up 76 defect repair proposals and submitted them for inclusion in the repair and investment plan.

Cooperation also continued as regards coordination when tramlines or road surfaces were being repaired. 20.2 km of the wastewater sewerage system were smoke-tested. Detection of unauthorised drainage of rainwater into sewage drain pipes helped to reduce the load on pumping stations and branch wastewater treatment plants. PVK employees thereby helped to improve their efficiency. They also found 13 sewage drain pipes incorrectly connected to the rainwater draining network. When the sewage drain pipes were disconnected, the surface water quality in Prague improved. A new camera vehicle was bought to ensure the quality of work on a par with the current technical standard.

Water quality

PVK's accredited laboratories carry out regular checks on drinking water and wastewater quality. The accreditation covers the entire range of the laboratories' activities: sampling and analysis of drinking, hot, packaged, surface, raw, ground and waste water, water from intermediary process stages (interstage water) and sludge, and bathing water, including waste sampling and analyses of process chemicals used in water treatment and purification.

Drinking water

Drinking water throughout Prague is safe. In respect of its physical, chemical, microbiological and biological properties, it complies fully with Czech and European standards. In 2018, the quality was checked throughout the production and distribution of drinking water, all the way to the consumer's tap.

Drinking water quality is regularly monitored in line with the requirements of Implementing Decree 252/2004, as amended, which lays down the requirements for drinking water and hot water and the extent and frequency of drinking water checks, and which is harmonised with the EU's drinking water requirements. Water quality is also checked after incidents, repairs, and any other interventions with the water supply networks. Drinking water quality monitoring complies with Implementing Decree 252/2004 and also relies on the assessment of risks in drinking water supply. Screening analyses of other risky pollutants to confirm that drinking water is free of other extraneous matter are carried out on a regular basis.

Under the Drinking Water Quality Monitoring Programme, in 2018 the distribution network was checked at delivery points to the distribution system, along the distribution routes and also at consumers. In terms of drinking water distribution, a problematic parameter is iron content and the related water colour and turbidity. In 2018, 2.76% of the distribution network samples failed to comply with the Programme in terms of iron, which implies a slight improvement compared with 2017. Responding to these unsatisfactory results, the water supply networks are subjected to purging and documents for their regular renovation are submitted.

In cooperation with the water treatment plants, in 2018 a total of 9,069 samples were taken from the drinking water supplied into the Prague water supply network. 378 samples were taken for post-incident water quality checks. In those samples, 10,717 parameters were determined, 99.6% of which complied with the Implementing Decree's drinking water requirements. Scheduled repairs were followed by the taking of 384 samples. In those samples, 8,264 parameters were determined, 99.6% of which were found to be compliant.

The use of alternative microbiological methods for determining drinking water quality has proved its worth in laboratory practice; laboratories are also testing additional new, modern options for determining water contamination, which help to obtain information about water quality faster than the conventional cultivation techniques that are used in standard cases of drinking water quality testing. These new methods are very important for examining consumers' concerns that their health complications and digestive difficulties may be caused by water, and also accelerate the feasibility of starting remedial measures when restoring the water mains into operation after incidents.

Wastewater

The PVK laboratory regularly monitors wastewater quality throughout the wastewater drainage and treatment process. Wastewater samples taken from the CWWTP and its process equipment, including sludge and sewage sludge gas, and wastewater from BWWTPs, industrial producers, the sewerage network, and the discharge points operated by PVK were analysed. Liquid waste delivered to the CWWTP and BWWTPs by outside entities was also checked. The range and frequency of checks complies with the applicable legislation on wastewater. The main reason for checking wastewater quality is to ensure compliance with the prescribed limits for wastewater discharge to prevent contaminated wastewater from discharging and, in turn, environmental damage.

In response to the rising number of wastewater samples, in 2017 and 2018 the wastewater laboratory was refurbished and enlarged, including the replacement of analysers and the procurement of new automatic instruments having the capacity to process large numbers of samples, thereby accelerating

the water quality monitoring process. The laboratory was therefore able to accommodate the increase in the number of samples caused by the commissioning of the New Water Line at the CWWTP.

In 2018, 21,624 samples were processed in the PVK wastewater laboratory, and 151,845 parameters were determined, i.e. 29.6% more of determined parameters than in 2017.

Other services

Besides its core business, PVK offers customers other services. Outside contracts account for a major share of the Company's total sales.

Cooperation with ČEZ

In 2018, Pražské vodovody a kanalizace, together with its partner companies Martia a.s. and Česká voda – Czech Water, a.s. (CVCW), followed up on the successful preceding year as regards the new generation of the maintenance outsourcing system. All maintenance activities were carried out without affecting the operation of the customer's water and sludge system as a logical whole and to the satisfaction of the customers, i.e. ČEZ, a.s., Elektrárny Počerady, a.s., and Energotrans, a.s.

PVK provides its maintenance services at the Mělník (including Energotrans, a.s.), Tušimice, Prunéřov, Ledvice, and Počerady (coal-fired units and a combined cycle unit) power stations.

In this scheme, PVK continues to work with its key supplier in mechanical equipment maintenance, CVCW. MARTIA, our main partner, provides services in electrical engineering and I&C. Thanks to this partnership, we can carry out most of the activities using our in-house capacities.

In 2018, PVK's turnover from maintenance activities amounted to CZK 47.1 million. Outside the above contract, major contracts valued CZK 11.2 million (such as repair of the pump at the Dolní Zálezly pumping station, CZK 4.7 million, rehabilitation of the ceilings of a neutralisation sump, CZK 2.5 million, repair of a demineralisation line by way of renovating corrosion protection, CZK 3.8 million) were carried out. These and other contracts generated a total turnover of CZK 58.3 million.

Official water flow measurements

In urbanised catchment hydrology and hydraulics, PVK provides the services of official measurements and assessments of the serviceability of water flow measurement systems; other services comprise the measurement of hydraulic variables in the sewerage and water supply networks, precipitation measurements and mathematical modelling in order to draw up documentation such as general drainage plans, general water supply plans and precipitation-runoff studies, measurement of hydraulic variables on hydraulic paths of wastewater treatment plants, water treatment plants and pumping stations, and reviews of facilities and assessment of their hydraulic functions. In 2018, the measurement of hydraulic and hydrological variables was carried out under numerous projects such as The Update and Management of the Prague General Water Drainage Plan, The Assessment of the Operation of Rainwater Management Installations in Brno, The Refurbishment and Completion of the Sewerage System in Brno, Monitoring of Wastewater – Interceptor Sewers, and other.

The Packaged Water project

Another three Prague boroughs (Praha 12, Praha 4, and Praha 20) joined the Packaged Water project in 2018. A total of 11 municipal districts are involved now. The number of disabled people interested in receiving bag-packaged drinking water through a delivery service increased also thanks to the participation and presentation of the project at the Welfare Services Fair.

Over the past year, the total production of the bags exceeded 38,000 units; compared with 2017, it increased by more than 100 containers. This type of emergency drinking water supply is becoming

increasingly popular. Containers with packaged drinking water were deployed in the case of 483 incidents on the water supply network. The entire logistics of packaged water was also significantly improved, and the records and warehousing management data were integrated within the economic and technical information system. With a view to ensuring the optimum storage conditions in the summer months, the Company has built a warehouse equipped with an industrial air conditioning unit.

Technological supervision

In 2018, PVK's water engineers were responsible for supervision or guidance and the incorporation of water management agendas at the CWWTP, the 20 branch WWTPs operated by PVK, and 68 sewage treatment plants of 1. SčV (which PVK operates or services). They paid great attention to issues surrounding the New Water Line and the coordination of its operation with that of the existing line.

As for drinking water technology, PVK engineers contributed to water quality checks in water abstraction, treatment and infiltration in Vodárna Káraný, a.s. and water quality checks in water treatment and transport for Želivská provozní a.s. They also contributed to the evaluation of the model GAC (granular active carbon) tests at the Želivka water treatment plant.

Cooperation in remote readings

PVK's metrology-related services include the repair and verification of 'meters obligatorily verified under Czech legislation', and the design and delivery of devices for remote readings of both billing and subsidiary meters. In 2018, PVK continued in a number of already running projects such as remote readings of billing water meters for Vodohospodářská společnost Sokolov, s.r.o. in Rokycany, for CHEVAK Cheb a.s., in Hradec Králové, for Kaufland, and for Frýdlantská vodárenská společnost, a.s.

Flood control measures

Prague has 33 pumping points on its sewerage networks; of those, 11 points are equipped with fixed immersible pumps driven by mobile motor generator sets. Mobile suction pumps have to be brought to the remaining 22 points. Every year sees two operating tests on the fixed pumping points and one operating test on the mobile pumping points. As part of the operating tests, a 'wet test' with mobile pumps is carried out either at the Hostivař water reservoir or at the Lobkovice weir pool.

Every year, the Mayor of Prague supervises testing exercises in flood control measures. In 2018, the exercise was organised in the Karlín-Libeň section, with PVK carrying out operating tests at two pumping points on Rohanské nábřeží.

Laboratory services

The PVK laboratory is responsible for taking and analysing samples both for PVK's internal requirements and for external customers on the basis of contracts or purchase orders. Major external services include water quality checks for Želivská provozní, a.s. and Vodárna Káraný a.s., which supply water to the distribution system operated by PVK. PVK was successful in winning the above contracts again in public tendering procedures during the year.

Že pro	livská ovozní a.s.	Vodárna Káraný, a.s.	Veolia	PVS	Other	Total
	CZK 7.7	CZK 2.9	CZK 5	CZK 6.9	CZK 7.5	CZK 30
	million	million	million	million	million	million

External customers of PVK laboratories

Downstream of the Water Meter services

In 2018, PVK carried out 75 repairs on the internal water supply and sewage draining plumbing of connected structures and fixed 56 incidents involving domestic distribution systems. In cooperation with Česká voda - Czech Water, a.s., a further 1,881 repairs were carried out on the internal water supply fixtures at our customers.

Pest control

In 2018, 13,715 sewer entry points in Prague were treated, entailing the use of 13,715 kg of rodent control bait.

Besides this across-the-board disinfestation in the Prague sewerage network, we carried out disinfestation at 55 facilities and disinsectisation at 28 facilities for our external customers.

Hydrant standpipe rentals

Customers rent two different-sized hydrant standpipes from PVK to pump water from hydrants. In 2018, 301 small DN20 standpipes and 209 large DN40-65 standpipes were rented.

Sewerage network servicing

PVK provided customers with a range of sewerage network services, including the emptying of grease traps, sewage tanks, sumps, and septic tanks, inspections of sewer pipes with TV cameras, the formation of new access points for public requirements, the construction of manholes and drainage pipes, and technical consulting. In 2018, PVK emptied sumps and disposed of the waste in 394 cases, emptied grease traps and disposed of the waste in 346 cases, and built 422 sewer access points, which was 178 (73%) points more than in 2017.

Domestic wastewater treatment plants

In 2018, PVK successfully continued its activities in domestic wastewater treatment plants, i.e. sales of wastewater treatment plants to customers who are unable to connect to the sewerage network. PVK supplied six domestic water treatment plants and provided services to improve the operation of another six plants.

CUSTOMERS

PVK follows a transparency policy and ethical rules as a precondition for building its long-term customer relationships based on trust, integrity, and mutual respect, without any discrimination.

PVK continuously develops and improves its customer services and enhances the convenience of services. This is why it offers modern and convenient communication channels to its contract customers.

Since 2003, our customer services have been certified under the international standard ČSN EN ISO 9001:2001. PVK again retained this certification in the 2018 annual re-audit, testifying to its highly professional, utmost-possible customer care.

Between 1 September and 10 October 2018, the Company ran its traditional **satisfaction survey**. The poll was conducted for PVK over the telephone by IBRS - International Business and Research Services s.r.o., an independent research agency. In all, 91% of respondents said they were happy with the services offered by PVK. Over 95% of respondents are satisfied with the professionalism of the Company's frontline employees. Some 95% of respondents are happy with the continuity of drinking water supply; 90% are happy with the quality of the water supplied. The research involved the

participation of 700 customers from Prague, comprising a mix of single-family building owners, multi-family residential building managers, housing cooperatives, industrial customers and corporates.

Contract customers and billing

PVK provides services to **91,408 customers**, supplying them with drinking water and draining and treating their wastewater contractually. Contract customers include individual customers (67,189), multi-family residential buildings and cooperatives (16,301), and corporates (other, 7,918). As certain customers may have more than one contract in place, PVK recorded 114,768 supply points at the end of 2018.

Approximately 45,000 PVK customers had their **bills e-mailed** to them in 2018. PVK also offered to send their tax documents via e-mail. This means that legal entities, after paying an advance, receive a tax document in advance so that they have problem-free VAT check reports. These customers were also able to make **online payments** via their VISA or MasterCard or, alternatively, a payment button, i.e. a link to internet banking with a pre-filled order. Contract customers who opt for the payment button simply select the bank where they have their online account. Since January 2016, the following financial institutions have been involved in this project: Česká spořitelna, a.s., Komerční banka, a.s., Raiffeisen Bank, a.s., mBank S.A., Era, and Československá obchodní banka, a.s.

Customers also paid their bills via the **terminals of Sazka sázková kancelář, a.s.** On the bill, they find a barcode, and the terminal can read the payment information contained in the code and issue a receipt confirming the customer's cash payment. The far-reaching terminal network (at newsagents, petrol stations, convenience stores, etc.) and extended opening hours allow customers to pay their bill as it suits them. A uniform fee of CZK 15 is charged for this service regardless of the amount paid. In 2018, more than CZK 45 million was paid in water and sewage rates via Sazka terminals.

Since 2013, another cashless avenue open to customers has been **QR-based mobile payments**. This involves a special QR payment code for banking applications on smart phones, printed by PVK on its billing documents. Even customers who do not own a smart phone with a banking application can use the QR code. This option is available with Česká spořitelna, a.s. Customers who bank with this savings bank can use all payment ATMs of Česká spořitelna, a.s. for paying using the QR code. In 2018, customers paid more than CZK 34 million for services using a QR code, up by CZK 12 million on 2017.



PVK contract customers

Contact centres

The call centre

In 2018, PVK's customer service line handled 91,543 calls with a 95.1% service level. Enquiries tended to centre on drinking water supply. Customer service line operators also respond to customers' e-mails. In 2018, they handled 40,873 customer e-mails and sent 26,436 text messages. Besides handling customers' calls and e-mails, operators also help to promote service provision, register

customers for the SMS INFO service, and offer e-mail billing, insurance to cover emergency situations, and the activation of the customer portal, the *Moje voda* mobile application, and other services.

The PVK call centre's organisation is in the hands of Solutions and Services, a.s. (the provider of ICT services within Veolia Group). In addition to its call centre management, Solutions and Services, a.s. has also taken over the reins of billing and debt recovery.

	2014	2015	2016	2017	2018
Number of handled calls	79,753	95,674	93,252	91,967	91,543
Service level	84.6%	93.8%	93.4%	93.7%	95.1%
Number of customer e-mails handled	30,244	37,625	44,573	43,458	40,873

Customer service centre

The customer service centre in Dykova Street, in Prague's Vinohrady district, had 22,187 visiting customers who arrived to sort out everything to do with their contractual relationships (conclusion of and amendments to contracts, information about bills, etc.). There were 1,150 more of them than in 2017. Another 7,057 customers visited the centre to tackle their technical requirements, including technical documents. At the customer service centre, customers can pay water and sewage bills and for water analyses, hydrants, etc., over the counter. More than CZK 35.95 million was received there.

Modern customer services

Customer portal and mobile application

In May 2017, PVK offered its customers a new, clear and user-friendly customer portal, and also a new mobile application for all customers and consumers. Via the portal or app, they can arrange certain requirements online, including changes in the payment settings, amendments to contracts, making online payments for water and sewage draining, and reporting water meter self-readings as at the required billing date. Customers also have an online overview of bills and water consumption, including the history. The option of making online payments via the portal or app is a highly superior service in the water industry. In 2018, 21,723 requirements were handled via the portal.

In 2019, the portal will be linked with Smart Metering, and the users will therefore see their smart readings and their current water consumption on the portal and will be able to set up alarms (temperature near the water meter, high consumption, night-time consumption) that will warn them of a high water consumption such as a dripping tap or flowing toilette.

The mobile app is geared not only towards customers, but also towards consumers, and is available for download to Android and iOS user interfaces.

Home assistance and refunds in case of water leaks for contract customers

In late 2015, PVK arranged for its contract customers insurance cover for emergencies related to water leakages downstream of the water meter. The service is provided by UNITED ASSISTANCE, a.s., and is provided free of charge to the customers. The assistance service is on hand round the clock. The assistance service crew visit the customer in case of an emergency and carry out two hours' technical work. Clients do not pay anything for the vehicle operation and the necessary work. A PVK customer is entitled to make use of three such assistance services per supply point free of charge every year. Customers can call the assistance service at 212 812 212. In 2018, 2,974 PVK customers called this line, of whom over 530 because of a refund or assistance. On the whole, 294 assistance interventions were carried out and fully paid for by UNITED ASSISTANCE, a.s. The most frequent causes of emergencies included a ruptured rising pipe or a pipe right downstream of the water meter.

Assistance services also include refunds for water leaks. This is partial compensation for any outlay on water supply caused by a water leak stemming from a demonstrable emergency, provided that the customer's share of the water leak is 10 m³, which is the minimum limit for refunds; the maximum water leak refund limit is CZK 15,000 per supply point per year.

SMS INFO

To date, 34,678 PVK customers have signed up for the SMS INFO service to receive text messages about incidents, water supply outages, the estimated downtime, etc. As such, registered customers receive, free of charge, important information about water via text messages transmitted to their handsets. In 2018, 31,748 text messages about incidents and outages were sent to the registered customers. A total of 906,154 text messages have been sent since the service was launched.

As at 31 December 2018

Number of contract customers	91,408
Number of supply points	114,768
Number of customers registered for SMS INFO	34,678
Number of SMS INFO text messages sent	31,748
Number of justified complaints and claims	257

In 2018, PVK received and handled 258 complaints, but only 25% of them, i.e. 65, were justified. There were 618 claims, of which 31% (192) were upheld.

Website

The PVK website (<u>www.pvk.cz</u>) is one of the Company's main information channels. On average, it attracts more than 60,000 visitors per month. The website has been optimised for the whole gamut of various devices (mobiles, notebooks, tablets, etc.), enabling customers to find the information they need anywhere, any time. News on incidents and water supply shutdowns generates some of the highest traffic. The people of Prague can find all the important information about water supply disruptions online here. In the "water incidents" section, they can find out about the incident site, the implications for water supply, the availability of substitute water sources and the estimated repair completion time. All of this, along with scheduled shutdowns, is also shown on Google Maps. This is the go-to place for Prague residents who need to know exactly where they can find emergency drinking water supplies. Another subject that is frequently looked up is the quality of water supply. In addition to complete monthly summaries of all water quality parameters, PVK's website offers overviews of certain indicators in supply zones. People can therefore find their street in the map and find the water hardness, the iron, nitrate and chlorine content in the water, and the water pH for this location. Customers can also use the website for making appointments at the customer service centre concerning contract and technical matters.

Those seeking information about the existence of utility networks can submit their request electronically. This service simplifies communication between the person making the request and PVK employees and shortens the time it takes to provide information on the existence of networks. The online request can be found on the PVK website. A person sending a request is e-mailed an automatically processed document, including a map plotting out the utility networks.

PVK service promotion

In 2018, PVK published a series of informational materials and brochures for customers and the general public. Towards the end of the year, the *Voda pro Vás* (*Water for You*) customer magazine was published (440,000 copies) and distributed together with all the major daily newspapers. The Company also produced a desk calendar to be handed out at the customer service centre in Dykova Street. PR and advertising campaigns on the radio, in the printed media, TV Praha and on news websites also helped to promote PVK's services.

RESPONSIBILITY

Responsibility towards employees

PVK is a stable and responsible company for which its employees constitute the core asset for the provision of services at a high standard and for technical and technological development. Attention at all management tiers is therefore focused on care for the employees. The Company's strategy incorporates adherence to a code of ethics and a code of conduct for managers, compliance with ISO and OSH standards, and environmental development.

PVK creates exceptional working conditions for its employees, provides interesting benefits, and prioritises professional advancement, employee training, and occupational safety. PVK management cooperates with the trade unions, which is crowned by the conclusion of a collective agreement every year.

Human resources

As at 31 December 2018, 1,065 employees worked for PVK. The average full-time equivalent number of employees (FTE) in 2018 was 1,040. During the year, a total of 89 employees left and 140 joined. Turnover therefore stood at 8.6%. The number of employees rose again, this time by 51, i.e. 5%, year-on-year. This increase was prompted, in particular, by developments associated with the rollout of new technology, through which PVK pursues its plan to expand its operations outside its core business and also to provide for the trial operation of the NWL.

Of the total number of 1,065 employees, 782 were men (73.4%) and 283 were women (26.6%). The Company employed 17 part-timers (1.6%), 64 temporary staff (6.0%), 16 persons with disabilities (1.7%), and 63 pensionable staff (5.9%).

A total of 234 (22%) PVK employees are degree holders; this constitutes a significant increase by nine employees who are degree holders; 421 (39.5%) employees have secondary education.

The average employee age was 46, the same as in the preceding year. Despite the low inflation rate, average wages went up by 6%.

Despite the high demand for service provision outside operating hours, the 23,127 overtime hours remained on a par with the previous year. This implies an average of 22 hours' overtime per employee per year.

Employee benefits

In 2018, the Company spent CZK 33 million, i.e. 4% of total personnel costs, on social expenditure for employees. Of this amount, CZK 1.5 million was spent on the trade union organisation's activities, CZK 1.3 million was spent on sport and cultural events, and CZK 0.6 million on personal and professional milestones and anniversaries. CZK 0.2 million was spent on social assistance and CZK 0.3 million on loans to employees.

Personal pension plans and life assurance are an important part of employee benefits and are used by 80% of employees. The employer's average monthly contribution to these policies amounted to CZK 1,400, with the Company contributing almost CZK 13.5 million altogether. The employees could utilise a number of other benefits such as contribution to meals (the meals card), etc. In 2018, the holiday leave was extended to six weeks for the employees who met the conditions for entitlement to holiday leave and met the set conditions.

Employee training

PVK has long focused on improving the skills and training its employees. This is one of its priorities and an integral part of its corporate culture, as well as a major factor for the Company's differentiation

in the market. A systematic approach to education brings a number of advantages and enhances employees' motivation and stability.

PVK's training costs totalled CZK 6.1 million. The largest share (80%) of these expenses was spent on increasing professional qualifications, 14% was spent on mandatory training and training of special professions and 6% on improving employees' language proficiency.

Training for employees of PVK and the other companies in the Veolia Group in the Czech Republic is mainly provided by the Group's own company, **Institut environmentálních služeb**, a.s. (IES), with its broad-ranging courses and training programmes, many of which are accredited by the Ministry of Education. IES is an important part of the international network of Veolia Group training centres, known as Veolia Campuses.

Occupational safety

Occupational safety stands alongside employee training as another strategic element established internationally for the entire Veolia Group, including PVK. The Veolia Group is committed, among other things, to guaranteeing a healthy and safe working environment. OSH ground rules contained in the Labour Code, applicable legislation and other OHS standards are also conveyed by the internal Code of Occupational Safety. The Company holds an occupational health and safety management system certificate. Above and beyond their mandatory training, all employees take a hands-on **first-aid course** once every two years.

One of the long-term objectives pursued in occupational health and safety is to bring down the number of occupational accidents. The criteria applicable to occupational accident prevention are subject to evaluation on a regular basis. The result is the fact that the occupational accident rate has been kept at an encouraging level. In 2018, there were three minor occupational accidents resulting in 68 working days of incapacity, i.e. 21 days less than the preceding year. The occupational accident rate was a mere 0.3%. Long-term OHS targets are to drive down accidents at work to a minimum and eliminate fatalities altogether.

In September 2018, PVK – much like the other Veolia Group companies – was involved in the International Safety Week, underpinned by the motto *Act for a Better Tomorrow*. A number of *Always Safe* documents were prepared to implement and support the rules, the IES education portal opened an OHS Library encompassing all training, brochures, films, etc. on OSH, and all employees were given hi-vis vests, stickers, and t-shirts with the *Act for a Better Tomorrow* motto.

Occupational medicine services

In 2018, the staff sickness rate was maintained at a low level of 2.7%. This was helped by the fact that PVK arranges for employees to undergo periodic medical examinations beyond the scope of mandatory checks. In cooperation with SALUBRA s.r.o., medical examinations were arranged for employees, including the vaccinations set out in the collective agreement and other statutory examinations. On the Hostivař premises, a general practitioner provides medical services to employees and their family members.

In addition, the next round of regular medical surveillance of workplaces and work performance was arranged to identify and assess the risk factors. The surveillance is carried out as part of the provision of occupational medicine services by SALUBRA s.r.o. in the presence of OHS and fire protection specialists and the manager of the relevant organisational unit.

As part of preventive occupational medicine care, each employee received Benu pharmacy vouchers worth CZK 1,500 for health promoting products. The employees can exchange these vouchers for pharmaceutical products and goods that are not paid under public health insurance; the purpose is to reduce the impact of occupational risks on their health (in particular, vitamins and vitamin supplements, and vaccinations).

Number of employees by year



Employee structure by length of service



Employee structure by age



Employment structure by level of education



Internal communications

After four years, 2018 again saw an employee satisfaction survey conducted to find the employees' views of the way in which the Company is managed. The feedback from this survey is very valuable for the Company's management as it helps them to take steps conducive to employees' better satisfaction and, in turn, better efficiency. In this manner, the management are seeking the ways and means for mutual communication and specific measures in the areas in which some criticism has appeared.

Despite the major changes taking place in the Company, 32% of the employees believe that information provision within the Company has improved and 35% of the respondents note that remuneration has improved. Some 90% of the employees are satisfied with the atmosphere in workplaces and with cooperation, and as many as 98% of the employees are convinced that great emphasis is being placed on OHS. Provision of various social benefits is regarded as satisfactory by 81% of the employees, and 82% of them are satisfied with the care for personal development and training.

A very positive fact is that 94% of the employees regard PVK as a promising company and good employer.

In addition to working meetings, the **intranet**, which is regularly updated and provides operating, technical, financial and other data and all reports in real time, continues to be the main communication channel.

In-house magazines are an important communication tool. The *Pévékáčko* in-house magazine is published five times a year and includes information on important PVK events also for those who have no access to the intranet. The *Naše Veolia* and *Planeta* newsletters report on the latest news within the Veolia Group.

Various informal meetings and events underpin good relationships in the Company. **Social gatherings and sport events** have a long tradition at PVK and many employees attend them. More than 140 employees participated in the 21st edition of the PVK Sport Games, which were held at a new venue, the sports arena in Nymburk. Hikers and cyclists pitted their strength against each other at the Water 50 event, teams of athletes also attended the CVCW badminton tournament, while tennis players regularly participate in the Jan Vrána Memorial and many employees also participated in Káranský vodovodník, a sports and benefit event for cyclists and hikers associated with a tour of the Káraný water treatment plant. Former PVK employees, now in the elderly age brackets, did not lag behind and attended the Seniors Sports Games organised by the Veolia Foundation. Several times a year, social gatherings, trips for employees and events for their children are organised.

PVK also regularly holds **corporate volunteering** days as an opportunity for employees to help the needy during normal working hours. In 2018, PVK offered help and organised a trip for disabled children from the Jedlička Institute to the Water House on the Želivka, with a tour of the Švihov protected water reservoir; employees also regularly join the Clean Up the Czech Republic event and also helped during the Jizera Clean River event around Káraný. These events testify to the importance of environmental protection for PVK and its employees.

Corporate social responsibility and environmental protection

Being a CSR company, PVK and its shareholder, Veolia, and the Veolia Foundation, pursue environmental protection, and support a number of interesting projects.

Awareness raising, education, lectures in schools, support for philanthropic projects, tap water promotion, biodiversity protection, economical treatment of water resources, reduction in water consumption, wastewater reuse and recycling, and reducing the environmental impact of the carbon footprint – these are PVK's activities that contribute to sustainable development and are among the major values in the Company's corporate strategy.

Support for projects

As in preceding years, in 2018 PVK again supported a large number of welfare, cultural, societal and sports events in the capital (i.e., Tapatan, Island of Reading and Games, the Primátorky (Mayoralty) regatta, the Ladronkafest leisure festival in Praha 6, the reSITE conference, the Architecture Days, etc.). Welfare projects include, e.g., Neslyšící s nadějí (The Deaf with Hope), Křesadlo (Flint) – a volunteering award organised by Hestia, donations to help purchase social-good cars for the disabled, support for Asistence, o.p.s., etc.

The Company is a **partner for the Water House** on the Želivka near the Švihov reservoir, and uses it for its educational events. The Water House promotes water as the habitat for aqueous fauna and flora and also as the vital precondition for life.

Education

In 2018, an **educational system for pupils of the primary schools** with which PVK cooperates on a long-term basis continued successfully. Lectures with experiments and work sheets specially adjusted for first-tier pupils met with a very favourable response both at the Prague Water Museum and directly at schools. The tours of the Horní Počernice – Čertousy WWTP were attended by dozens of classes at the second tier of primary schools and of secondary schools.

The lectures cover water circulation in the water industry, and water consumption issues, and also enlighten the participants on what should not be discharged into the sewerage and on environmental issues. Work sheets help the pupils and students to better understand the water management loop and the issues concerning water and the environment.

In late 2018, a number of primary schools signed up for a new competition called *Water in the Landscape*. Its purpose is to show the children the measures that can be adopted to fight against draught and for water retention in the landscape. The competition will be evaluated in 2019.

Since 2000, PVK has been organising **Klub vodních strážců (Water Guards Club)**, which brings together children aged 6 to 15. The children receive a magazine two times per year, enlightening them

on water related issues, the same as the website at <u>www.vodnistrazci.cz</u>, which is being updated continuously. As in preceding years, the club worked with Jakub Vágner, a world renowned angler, who prepared a lecture on his adventurous excursions for the children.

PVK presents its operations to the public

In 2018, PVK organised a number of events where the customers and the public had opportunities to learn about PVK's activities. For the second time last year, PVK laboratories made it possible for customers to bring samples of their well water and made simple analyses of the samples for them free of charge. In April, the Horní Počernice – Čertousy WWTP opened to the public. There was enormous interest in visiting the sewerage under the Old Town Hall, known as the Foreigners' Entrance under the Old Town Hall, with 350 people visiting it during the day. The Company also showed its activities at an event called *Under PVK's Surface*, held at the Podolí Waterworks.

Some 500 athletes attended Káranský vodovodník, a sports and benefit event in Káraný when the Káraný water treatment plant opens to the public.

Fresh Tap Water?

The purpose of the Fresh Tap Water? Just Ask! project is to promote the drinking of tap water in restaurants. In 2018 again, a number of restaurants expressed their interest in the project carafes and started to offer tap water, which helps to reduce the waste caused by PET bottles and hence cuts down on emissions from the transport of drinks by automobiles. Information about the project is available at <u>www.kohoutkova.cz</u>.

As part of its support for tap water, PVK also contributed to the installation of drinking water fountains in Praha 7. The Company laid on a water bar and fresh drinking water in tanks at dozens of events held in Prague, such as Microclimate, Bike Prague, the Children's Day at Žluté lázně, Running for Paraple, Summer Letná and many others, where drinking water from the tap was served to refresh visitors.

Prague Water Museum

The water museum in Podolí, visited by thousands of people every year, contributes to public awareness on a long-term basis. In 2018, its collections were extended to include five collectible items, four of which had been restored to a condition fit for displaying and included in the exhibition. The largest event was the design preparations, transport and installation of a piston pump driven by a waterwheel, which had been produced by the company Josef Gatter in Kuřívody near Česká Lípa in 1902. An original wooden pump dated 1928 from Líšťany near Louny, and a water ram from the 1980s, complemented with a water ram from 1897, were included in the collections and also put on display. The exhibition section on the Káraný water treatment plant was extended to include the original cast-iron cover of a water well from 1910. A section from a wooden water pipe from archaeological research on the Small Town Square was also included in the collections.

The spring and autumn saw open days on the occasion of the World Water Day and the Architecture Days, respectively. The Museum also opened for the Neighbours Festival in Podolí. It attracted a total of 11,534 visitors last year.

Demand for guided tours, not only on the part of schools but also various institutions (the Ministry of the Environment), companies and civic associations (both Czech and foreign) is increasing. In 2018, the Museum was again involved in experiential travel, attracting 400 visitors. The Museum also welcomed delegations of water experts from abroad, including Amina J. Mohammed, the UN Deputy Secretary-General involved in the protection of water resources, delegations of water managers from Uzbekistan, China, Norway and Ukraine, and Czech Senator Jiří Drahoš.

Conservation of biodiversity at PVK complexes

PVK has long supported a biodiversity project aimed at bringing nature back to cities. The protection and renewal of biodiversity is one of the nine key sustainability commitments adopted by the Veolia Group.

In the past few years, PVK has installed insect hotels and nest boxes on its water management sites in Prague. In cooperation with the Czech Union for Nature Conservation it soft landscaped the area above the Flora water reservoir, where animal and green plant diversity has increased, and it also sowed a flowery meadow at the Ovčín water reservoir. The Company carried out measures on the Káraný site to enhance biodiversity; for example, it set up permanent biomass stockpiles and built stone walls and mounted a nest box for kestrel. In Prosek, it sowed a meadow, and it also sowed the premises in Modřany Sever II, Zelená Liška, and Kvestorská.

Biodiversity protection continued on three Company premises in 2018. In Ládví, it planted a hedgerow, the same as at the Čertousy BWWTP to separate it from the residential development there, and it grassed the Laurová water tank following its refurbishment. No other meadows were sowed because of the draught.

In this context, PVK is active in the Coordination Committee responsible for the preparation of the implementation plan related to the strategy of the adjustment of the City of Prague to the climate change. PVK suggests a viable **solution based on misting.** It is a variant of local **reduction in ambient temperature at exposed places** (referred to as heat islands in the city) on the principle of water drop evaporation. The main principle of this cooling system is the artificial production of very small water droplets that can evaporate before they fall down on any surface. These drops absorb a part of solar energy, which transforms water into vapour, which cools down the air.

Environmental management and energy management

PVK's operations are closely tied with the environment; wastewater treatment is the greatest contribution to environmental protection. The Company takes a responsible approach to environmental issues. In practice this means that it consistently follows applicable legislation and keeps developing new processes for waste reduction and recycling and for efficient energy use.

Waste management

PVK is an operator of water supply and sewerage networks. As such, it not only produces waste, but certain kinds of wastes can also be processed (used) at some of its wastewater treatment plants.

Waste production

In 2018, PVK produced 177,000 tonnes of waste. 48% of this amount was made up of sludge from the treatment of municipal wastewater; approximately 48% was construction site spoil produced in repair and incidents in the Prague water supply network, and only about 0.02% was hazardous waste. The share of hazardous waste at the Company has long been negligible. The remaining 4% is attributable to other process waste from the treatment of municipal wastewater together with municipal waste and separated waste (paper, plastics, and glass).

PVK is very particular about environmentally-friendly waste disposal and cooperates, as much as possible, with entities that prefer waste recovery to waste disposal. Only a minimum share of our waste is not reused.

Construction site waste, coming from repairs of incidents in the Prague water supply network, is transferred to our contract partners for reuse. This waste is fed into the production of recycled materials for construction, which are used in the construction industry and in the rollout of various linear structures as replacement for primary raw materials. Another option for the use of our construction site waste is in the gradual remediation of the areas affected by gravel-sand quarrying. The reclamation of these areas will result in water bodies on extraction sites, and also grass-covered

and forested areas formed by filling the extracted area with inert materials, with our construction site waste contributing to such projects.

Sludge from municipal wastewater treatment is applied to farmland while meeting all the principles and requirements of the applicable legislation regulating waste management and farmland protection. Sanitised sludge is a resource rich in organic matter, basic nutrients, and trace elements for the exhausted soil in the Czech Republic. The application of this sludge helps to improve the physical, chemical and biological properties of soil, which then better retains water in the landscape, with the soil erosion risk mitigated, etc. Farmland fertility is enhanced by WWTP sludge. For the cooperating farm businesses, sludge fills the gap left by the declining output of farm fertilisers from animal production; the farm businesses also have lower requirements for artificial fertilisers.

In 2018, PVK cooperated with 35 farm businesses in three Regions (City of Prague, the Central Bohemian Region, and the Ústecký Region), 13 Districts (Louny, Litoměřice, Česká Lípa, Mladá Boleslav, Mělník, Kladno, Beroun, City of Prague, Prague-East, Prague-West, Nymburk, Kolín, and Kutná Hora) and several composting businesses. Of the total quantity of sludge produced, 88% was used in farming, 9% in composting operations, and 3% for reclamation purposes.



A general map of sites where sanitised PVK sludge is handled (farmland, composting)

Waste processing

PVK is not only a producer of waste, but also operates a facility to process selected types of biodegradable waste. It offers the city and businesses a service where their waste is handled transparently and passed on for reuse. In 2018, CWWTP processed some 3,000 tonnes of such waste; compared with preceding years this is a dramatic drop, which was caused by the technical condition of the CWWTP in 2018. Of this amount, CWWTP received some 2,200 tonnes of liquid grease waste, which therefore did not reach the Prague sewerage network. PVK's unblocking service also sends its own crews to collect this type of waste from the grease traps of restaurants and other catering facilities (such as kindergartens, schools, hospitals and other entities). In 2018, this mobile collection brought PVK about 660 tonnes of grease waste from 120 partners.

Carbon footprint

PVK first subscribed to assessing the impacts of its operations through its carbon footprint (CFP) in 2010, when the first evaluation of the Company's carbon management was prepared.

In terms of carbon footprint evaluation, it is not only important to quantity the CO₂ equivalent of emissions; their year-on-year and long-term trends are often much more interesting. In many cases, it is not feasible to ensure or to envisage a continuous reduction in the carbon footprint. The

environmental approach should follow the rule 'everything is related to everything'. In drinking water production and wastewater treatment, the quality requirements are being tightened on an ongoing basis, which is associated with the deployment of modern technology and more intensive treatment and purification processes. These efficient technologies are often more energy intensive, and it is precisely electricity demand which constitutes one of the most important components of carbon footprint evaluation.

Projects targeting electricity and thermal energy savings, an increase in the generation of energy from renewable sources, greater plant self-sufficiency, and the optimisation of chemical and fuel consumption have triggered a progressive reduction in the Company's overall carbon footprint.

PVK's overall carbon footprint for 2018 was **31,400 tonnes of CO₂ equivalent**, which was **6,800 tonnes of CO₂ equivalent** less than in 2017 (in 2017, it was **38,200 tonnes of CO₂ equivalent**).

Total direct and indirect greenhouse gas emissions (electricity and heat) related to the collection and treatment of wastewater at PVK significantly decreased in 2018. These emissions amounted to **9,660 tonnes of CO₂ equivalent**, while the figure was 15,920 tonnes in 2017. Energy consumption is the main source of CO₂ emissions in wastewater treatment plants. These emissions are proportionately reduced by the Company's own combined heat and power generation from biogas, which does not contribute fossil emissions to the air.

Emissions associated with drinking water production and distribution were **21,200 tonnes of CO₂ equivalent** (in 2017, they were 21,730 tonnes of CO₂ equivalent). Ratios, potentially carrying a greater informative value, indicate that, at PVK, **549.2 g of CO₂ equivalent** was generated per cubic metre of drinking water produced and **86.8 g of CO₂ equivalent** was generated per cubic metre of treated water (in 2017, it was 123.86 g of CO₂ equivalent).

The practical examples of carbon footprint reduction at PVK include:

Remote readings, which bring tremendous time savings and also – very important from the perspective of the carbon footprint – considerable savings of the motor fuels that would otherwise be burnt in the case of manual readings.

Motor fuel savings: A new car sharing system was launched in 2015. A car booking system was installed in the Helios Green internal system. Work continued on installing GPS to monitor journeys and automatically import data on vehicle operation. The data so obtained is systematically analysed and fuel consumption and utilisation of each and every vehicle are checked. In 2018, PVK saved an additional 12,000 l of diesel, the same as in 2017.

Biogas upgrade to natural gas quality, bio CNG

The substance of the forthcoming project is to upgrade the biogas produced at the CWWTP to natural gas quality and then use it in transport as biomethane or for injection into the gas grid.

Biomethane is biogas upgraded to a content of at least 95% of methane, which equals the quality of the gas in the gas grid or the CNG quality. It has the lowest emissions among greenhouse gases and compared with the other conventional biofuels, it also has the lowest energy demand throughout its lifecycle, in particular when produced from waste biomass.

The pilot unit has been designed for 250 Nm³/hr of raw biogas directly on the CWWTP premises in Prague, and is primarily intended to process excess biogas which is only flared without any use at present. The unit could fuel up to 70 CNG vehicles every day.

PVK's total emissions are shown in the chart below. The trend of reductions in the carbon footprint is clearly a steady and long lasting one.



Cooperation with Veolia Foundation

PVK and Veolia Foundation have been cooperating since the very beginning of the Foundation, i.e. 2003. PVK is a major donor to the Foundation and participates in a number of socialminded projects in Prague and in environmental activities. The Foundation's key projects in which PVK participates include the following: MiNiGrants, Keep Smiling, Water for Africa, Let's Return Water to Nature, and Clean Up the World, Clean Up the Czech Republic.

MiNiGrants

Every year, PVK employees join Veolia Foundation's MiNiGrants programme. The small grants provide them with financial support for projects that benefit the community and are carried out in their spare time. It was the eleventh year of the MiNiGrant scheme. In 2018, CZK 766,400 was split among 29 volunteer projects.

The largest number of projects helps disadvantaged people such as disabled and elderly people and children in foster care. A large portion of the funds was granted to projects geared towards leisure activities for children and young people, but also environmental protection, such as support for Czech Red Cross and education for children.

Over the eleven MiNiGrant editions, PVK with Veolia Foundation have supported 190 projects for almost CZK 6.5 million.

For his help to disadvantaged people, in 2018 PVK employee Petr Veselý received the Křesadlo (Flint) award, which is intended for ordinary people doing extraordinary things. HESTIA's volunteering centre has been giving this award since 2001 under the auspices of Prague Mayors, but only to ten people. Mr Veselý has long been organising, for a Substitute Family Care Centre, programmes for children during their weekend stays. His own five children also help him in this volunteering.

Keep Smiling

Under the Keep Smiling – Active for Life programme, in 2018 the Foundation together with PVK supported 12 Prague-based non-profit organisations that either carry on community projects in Prague or have prepared nationwide projects. Most of these organisations and their projects were supported

repeatedly, with the exception of two conferences on the training of experts working with elderly people.

The implemented projects focused on the education and physical exercise of elderly people and also on support for home carers, field services, and service quality in residential care homes for seniors.

All supported projects can be regarded as examples of good practice; they have an inter-generational nature and a potential to expand or to be followed, and they help to educate the public. The supported institutions include, for example, the Institute of Dignified Ageing of Diaconia of the Evangelical Church of Czech Brethren, Sociální Služby Praha 9, z.ú., Stáří s aktivní tváří z.s., Domov Sue Ryder, z.ú., etc.

Water for Africa

The cooperation with Veolia Foundation concerned the ninth edition of the Water for Africa project that helps to build and repair water resources in southern Ethiopia. In last year's beneficial sale, people could buy a new design carafe created by Eduard Seibert, an UMPRUM Prague student, glass water bottles in neoprene wraps, and wooden brooches with the motif of a lion. The beneficial sale raised a record CZK 919,000, which will be spent on building supply pipes connected to the water network for eight health centres in the Sidama zone in southern Ethiopia.

Let's Return Water to Nature

In cooperation with the Czech Union for Nature Conservation, in November the Foundation launched a new project to revive wetlands in the Czech Republic. The Union seeks to identify suitable sites, and then buys and protects them for a long time, thereby preserving them for nature. The beneficial sale of the 'wetland' carafes and other items takes place through the Foundation's e-shop and continues in 2019.

INNOVATION

Pražské vodovody a kanalizace, a.s. focus on smart solutions and energy savings, digitalisation, and automation. Modern technology helps PVK to improve its services. New solutions help the users to cut costs and offer them convenience and continuous control.

SWiM – Smart Energy

In 2018, PVK continued to extend SWiM (Smart Water integrated Management), a modern system of water service management and control, to include the Smart Energy scheme. The scheme was extended to include electricity demand planning at additional pumping stations and BWWTP, which are categorised as high-demand electrical loads. This includes 48 facilities at which Smart Energy is deployed and optimises the quantity of electrical energy bought. In 2018, some other measures were put in place with a view to improving the safety of the SWiM system.

Digitalisation of water meter installation sheets

Cooperation in the digitalisation of installation sheets, under the guidance of Solutions and Services, a.s., was started in 2018. In the process of replacing, installing and uninstalling water meters and their accessories, the solution replaces the paper installation sheets with the same in electronic form in a mobile application for Android 5 and higher versions. The solution will help to reduce the errors caused by the human factor and improve the quality and extent of the data processed.

The main objective of using the mobile application is to streamline the working procedures, i.e. eliminate the step involving the manual typing of data from paper forms in the customer information system, while reducing the mistakes in data writing in the field by means of the checks supported by the mobile application and using photographs. It also makes it possible to print the confirmation of installation directly in the field, unify working procedures, and improve personal data protection.

Cooperation in grant-funded projects

Together with partners in the academic and research spheres, in 2018 PVK employees tackled grantfunded projects centred on the impact of micropollutants in drinking water sources, on the reusability of 'greywater' from households, on the recycling of wastewater from municipal wastewater treatment plants, and on the optimisation of the sludge system, specifically the following multi-year projects: Improvement of the Quality of Stabilised Sludge Using Post Aeration; Wastewater Recycling for Use in Water Management of Future Cities; Modular Technology for Separate Treatment of Grey Water; and Protection of Critical Infrastructure, the Želivka Water Source, against the Effects of Pharmaceutical and Personal Care Products and Pesticides under the Conditions of Long-term Draught.

Refurbishment of water supply and sewerage installations

The technological improvements and refurbishments that have been carried out enhance the performance and efficiency of work, increase reliability, and bring positive results in terms of energy savings and environmental protection.

At the Klíčov water reservoir, the valve chamber of the new reservoir was completely refurbished, which entailed wall rehabilitation and the replacement of all piping and valves.

The Ládví III water reservoir: the ceiling structure was replaced and accumulation chamber 3 was completely rehabilitated; subsequently the adjacent valve chamber was totally repaired. The corroded piping was replaced with new stainless pipes, and all closing valves were replaced.

The Lhotka water reservoirs: the ceiling structure was replaced and the walls, columns and bottoms of accumulation chambers 3 and 4 were completely rehabilitated. New access to the accumulation chambers was built. The accumulation chambers of the old Hrdlořezy water reservoir were also completely rehabilitated and the civil part of the valve chamber was completely refurbished; subsequently, the piping, valves and electrical wiring were replaced.

The old Strážovská water reservoir: the ceiling structure was replaced and the walls, columns and bottoms of accumulation chambers 1 and 2 were completely rehabilitated. The valve chamber was completely refurbished. Simultaneously, the ceiling structure and the roof shell of the Jesenice II water reservoir were refurbished.

The industrial water pumping station: The Malešice pumping station, which supplies industrial water primarily for the Malešice incinerating plant and for the irrigation of the Černý Most resort golf courses, was completely refurbished and automated. In addition to the building itself, the refurbishment also included the transformer station and complete electrical wiring and piping; new pumps were installed. The original water reservoir was closed down, for its capacity was no longer sufficient and it was obsolete in technical terms. For increasing the efficiency of pumping and reducing energy intensity, the new pumping station therefore uses the residual pressure in the inlet on the suction of the pumps.

Refurbishments were also carried out at branch wastewater treatment plants. At the Kbely BWWTP, refurbishment included the service water pumping station that helps to ensure the reuse of treated wastewater, mainly for rinsing the sludge treatment machines and equipment. The electric boiler room was also completely refurbished at this BWWTP; the original electric boilers approaching the end of their useful life were replaced with a system for heat recovery from treated wastewater using heat pumps.

Wastewater pumping stations: overall refurbishment concerned the Vachkov wastewater pumping station. New, higher-efficiency pumps were installed, and piping and valves were replaced. A new distribution board equipped with telemetry was also installed.

Assistance with the New Water Line

Throughout the year, PVK cooperated on the commissioning of the New Water Line (NWL), which took 35 months to build and was put into operation in September 2018. It is owned by the City of Prague. It is currently the largest and most important water management project in the Czech Republic. The NWL is completely covered, has a green roof including landscaping, and is equipped with deodorisation. With its modern equipment it is expected, unlike the CWWTP from the 1960s, to provide for a significantly higher efficiency of wastewater treatment, including, without limitation, nitrogen and phosphorus elimination. PVK is the operator of the NWL and the main pumping station throughout the trial operation period.

In late 2018, the warehouse building at CWWTP was approved for use; the warehouses are a fullyfledged modern substitute for the original halls, which were removed to clear space for the construction of the NWL.

Renovation of rain gauging stations has improved the reliability of measurements

Metering instrumentation was renovated at 18 permanent rain gauging stations in 2018. The Company installed modern recording units and connected them to the existing rain gauges, including remote transmission of the current rainfall intensities to its data archives and of the ten-minute totals to the archives of the Czech Hydrometeorological Institute. The recording units also feature remote transmission of archived data to the data server and the distribution of warning text messages in the GSM network, which helps to improve the reliability of measurements and to find defects quickly. The Company also upgraded the temperature sensors for ambient temperature measurements and the rain gauge heating controllers; this will ensure trouble-free operation in winter.

Monitoring the condition of interceptor sewers helps to prevent incidents

In 2018, the Company extended the online monitoring of interceptor sewer quality. Following the earlier established monitoring on the ACK sewer, which covers 64% of the entire inflow into the CWWTP, the monitoring was extended to include the F and E sewers. The measuring probes were installed on a float; the reason was the size of the sewer's cross-section and the difference in the water table during daytime and night-time. Now, the Company has a qualitative overview of 86% of all the water flowing into the CWWTP. The monitoring scheme helps to identify the point from which above-limit concentrations of pollutants flow, and hence prevent potential incidents at the CWWTP.



The functionality of the monitoring station on the ACK site was extended. When the required set value of the alarm signal is exceeded or not achieved, the system now transmits an informative text message on the event and the automatic sampler starts to take samples at regular intervals until the end of the alarm. The alarms are currently set for the values of COD, pH, and toxicity.

GIS improvement

PVK continues to improve the GIS system, and hence also its responsiveness to customers' requirements. In 2018, it extended the service whereby it provides, free of charge, plots of networks and plots of networks for building permit proceedings. Applicants no longer have to call on the customer service centre in person, and can arrange everything conveniently online. They receive the information in one to five days from submitting their request, while the statutory time limit is up to 30 days. Some time ago, PVK launched a free online service – request for information about the existence of networks. Applicants can receive information whether or not installations operated by PVK are located within the area of their interest.

IT development

In 2018, PVK continued and further extended its cooperation with Solutions and Services, a.s., which provides PVK with most information technology services.

Routine modifications intended to optimise and accelerate the operations were made in the customer and economic information systems. A new customer portal with many improvements enhancing the clarity of information for our customers was being developed. The Reporting project for collecting and working with PVK data from all areas continued.

The Company started to use a new mobile client of the technical system (EMA), which supports online processing and updating of technical data on our networks.

Great attention was paid to safety, primarily the separation and protection of the technology network for controlling the operation of water and wastewater treatment plants. The Service Desk program was extended to include the key ITIL processes.

The location and configuration of printers continued to be optimised, which helps to cut costs.

PVK's data network was continuously reinforced due to the increasing quantities of the data transmitted and processed.

The finalisation of the Central Reporting project continued in 2018. The purpose is to concentrate all the data required for each of the Company's activities and to have a possibility to analyse the data and generate output reports. The Helios Green (ERP) system underwent further development: in addition to developing mobile technology, the implementation of the energy module is being finalised, the procurement process is being optimised overall, document management is being optimised, and the integration with PVK's other information systems is being intensified.

As regards the Customer Information System, the Company developed additional options for using data from remote readings, mobile devices in the installation of water meters and re-examination of supply points, the agenda for outages and water supply shutdowns, and other capabilities of the customer portal.

PVK is gradually automating and robotising its processes.

Institut environmentálních služeb (IES) in 2018

IES shareholder structure:

Campus Veolia France40%Pražské vodovody a kanalizace, a.s.30%Veolia Energie Česká republika, a.s.30%

IES highlights for 2018

Sales: CZK 35,495,000

Number of training sessions: 6,076 Number of educational events held: 1,074 Number of lessons (of 60 minutes each): 29,709 Number of training hours: 155,626 Number of employees: 13 (over a half of them part-time) Number of participants in educational events: 14,081

The year 2018 also vindicated the strategy adopted for the sustainable development of IES. Only a slight decline in sales (by 4.6%) compared with 2017 is the result of IES's successful effort to compensate the decline in revenue from some customers (such as Veolia Energie ČR, and foreign customers in Veolia Group) by growing revenue from other customers. For example, total income from Veolia Česká republika companies rose by 8.7%, income from Veolia Energia Slovensko rose by 15.4% and, above all, income from non-Veolia customers surged by 460.8%. Compared with 2017, in 2018 IES was also successful in increasing the number of training hours by almost 19% despite the fact that the number of participants in training events decreased and the number of lessons declined, although only slightly. This means that the saturation of educational events increased, i.e., more participants used the opportunity to attend a given educational event. It is also worth mentioning that courses that are mandatory under the law were attended by a total of 8,182 employees of Veolia Group in the Czech Republic and Slovakia. It should be noted that IES's favourable financial results are attributable to its long-term and proven corporate strategy, regular preparation of new attractive projects, frequent innovations, its experienced team's commitment, and its consistent cost control.

Intensive utilisation of IES's eCampus educational portal continued in 2018. A total of 14,395 users (of whom 2,617 PVK employees) took 63 different e-learning courses, such as the induction training, personal data protection, drivers' training, the code of ethics, the anti-corruption code, the basics of hygiene, Always Safe, Compliance, OHS and Managers, training concerning professional competence in electrical engineering, etc. Induction training for the various companies was passed by a total of 427 graduates (of whom 104 from PVK). For example, the course focused on the anti-corruption code of ethics was prepared not only for employees in the Czech Republic and Slovakia but also those in Hungary and Lithuania.

The OHS electronic library was expanded to include current posters, brochures, internal materials and videos produced as part of the OHS Week Veolia 2018. The OHS library is organically linked with a number of e-learning courses on OHS, which IES's eCampus also offers.

In 2018, IES again conducted, after four years, a satisfaction survey amongst Veolia Group's employees in the Czech Republic and Slovakia. All employees were approached. In the end, 6,915 employees of Veolia Group participated in the survey; 73% of PVK employees participated.

As part of a strategic project for the digitalisation of its activities, IES prepared a specialised virtual guided tour of a wastewater treatment plant, with a real guide and an expert in wastewater technology, which is part of the specialist study programmes in the discipline of water management, such as the Water and Sewage Network Operator programme. A second variant has been prepared as a special e-learning course in eCampus, which makes it possible for all users of this educational portal to take a virtual tour of a wastewater treatment plant.

In May 2018, IES opened, for the needs of The Water Supply and Sewerage Association of the Czech Republic (SOVAK) and Veolia Group itself, another course of the innovated Water and Sewage Network Operator study programme, currently attended by 33 people, of whom 9 are PVK employees. In that same year, 33 participants in the preceding course successfully completed these studies by passing the school leaving examination [*maturita*] at the College of Construction and the Secondary School of Construction in Vysoké Mýto. The graduates also met the qualification requirements under Act No 274/2001 on Water Supply and Sewerage Networks.

In 2018, IES started a new tradition for the needs of Veolia Group in the Czech Republic and Slovakia, and organised a one-day Spring Meeting of Lady Managers, which was attended by 73 lady managers, eight of whom were from PVK.

IES responded flexibly to the training needs of each company in Veolia Group. For example, 120 PVK employees went through training in underground work and in work over open spaces without protection, and 93 PVK employees took a course required for improving drivers' professional competence under Act No 247/2000 as amended in Act No374/2007. In 2018, basic and advanced training related to the implementation of Google Apps also continued, and was attended by a total of 264 employees.