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Estonian Water Works Association's (EVEL) Study Tour to Portugal: Summary

06 – 10 November 2017

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1. Purpose of the study tour

Purpose of the trip was to visit the Portuguese water operators and their umbrella organization and gain knowledge and practices that could be used in Estonia.

Also, the aim was to broaden horizons in the applied technology, national regulations, as well as in the structure of the water management.

And finally, the most important was to discuss together the information that had been gained.

2. Portugal in General

- Cities are very car-centred. Cycle-paths do exist, but there are no cyclists.
- Rents are slightly higher than in Tallinn, but other than that, the costs are comparable with those in Estonia.
- Portugal is importing the majority of the electricity and therefore, the electricity prices are among the highest in Europe.
- While Portugal still ruled its colonies, the country flourished by means of raw materials – diamonds from Angola, etc. Losing the colonies has left the economy suffer. Even today, the Portuguese say that the country continues to be in a crisis.
- Very small amount of precipitation that the country received this year has caused extremely vast wildfires that have concerned even Estonia.
- Majority of the population lives in the coastal region. Population in the eastern part of the country is significantly falling and aging. With every 20 years, the country loses 1 million residents.
- Number of population is ca 10 million.
- Very polite driving-culture.



Aqueduct in Lisbon. 16 km long, dates back to 15th century.



Area of wildfires

3. Day One – 05.11.2017

3.1 Meeting with EPAL, „Empresa Pública das Águas de Lisboa“

<http://www.epal.pt/EPAL/en/homepage>



- EPAL is the water operator in Lisbon region that owns and operates the city's water network and is responsible for conducting raw water from water reservoirs and bore wells to the water storage tanks across the capital city.
- Company supplies drinking water to customers in Lisbon and its surrounding regions, all in all to approx. 2.9 million residents. Company owns water distribution network only in the capital city.
- In the surrounding regions the water is sold to the regional water network operators.
- EPAL can extract and supply its customers max 1 million m³ of water every day. 80% of water is extracted from the dammed water reservoirs and the rest of 20% from the bore wells. The bore wells are usually kept in reserve.
- The surface water is treated at the water treatment plants located by the reservoirs and after passing through ca 100 km of transit pipelines, treated drinking water is conducted into the water storage tanks across Lisbon, and further on to distribution network.
- EPAL owns and operates the largest water treatment plant in Europe.
- The Lisbon region is located between 7 mountains, presenting the company with a challenge of operating in 13 different pressure zones.

- Tariffs

In Lisbon, the drinking water costs ca 50 cents/m³, while in the surrounding regions the tariff is up to 2.5 EUR/m³

Extract of drinking water tariffs in Lisbon: <http://www.epal.pt/EPAL/en/menu/customers/tariff>

In the tourist regions around Lisbon (seasonal regions), fixed charges are applied.

- Company

The company has implemented a policy that all the development activity (GIS, projects, plans and designs, etc.) is carried out within the company, without involving any external consultants. Aim of this is to keep the know-how within the organization.

Number of employees has been reduced from 1,200 down to 800. Average age is 57 years.

3.2 Meeting with the Portuguese Association of Water Distributors

<http://www.apda.pt>



- At the Portuguese Association of Water Supply and Sewerage Companies (APDA - Associação Portuguesa de Distribuição e Drenagem de Águas)
- We received a presentation on the competency centre called Lisbon International Centre for Water - LIS-Water - that was launched in October 2017. The project is funded through the EU Horizon 2020 programme. For more information, please read online:

3.3 Lisbon Oceanarium

<https://www.oceanario.pt/en>



- Small and big fish live friendly together in the same aquarium, and no one gets eaten. This is due to the regular feeding of the fish.
- 90% of the water in the aquarium is treated, 10% of water is renewed with water taken from the water distribution network.
- Water is not originally taken from the ocean - the right balance of saltiness is achieved by adding salts and minerals to the tap water.

4. Day Two – 07.11.17

4.1 Aguas de Portugal Group (Portuguese Water Management Company)

<http://www.adp.pt/en/>



- Nation-wide company managing regional water companies, owned by the state (51%) and by the local municipalities (49%).
- APG was established in 1993.
- The company has subsidiaries, regional water companies, who own the water resources, reservoirs and the water and wastewater treatment plants. At the same time, regional water companies may also be the operators of the networks owned by the local municipalities.
- Networks within the cities and urban areas are usually owned by the local municipalities. These networks are operated by the local municipalities themselves or by the private companies through the concession agreements on operating.
- Foreign operators include companies from France, China and Japan.
- The company has set up subsidiaries to provide consulting services in the former Portuguese colonies.
- The company with its subsidiaries provides water and wastewater operating services to ca 90% of the population.
- Portugal does not rely on the EU aid anymore and is working on increasing the public awareness instead.

4.2 Alcantara Wastewater Treatment Plant

<http://www.adp.pt/en//?id=61&img=39&bl=6>



- The largest in Portugal, providing service to ca 750,000 people in Lisbon region.
- Effluent parameters do not include phosphorus and nitrogen. The studies indicate no need for the removal of P and N.
- The plant also operates the main pumping stations across Lisbon and the collectors from the main pumping stations to the water treatment plant. It does not operate the street network.
- Treats ca 100,000 m³/day.

5. Day Three – 8.11.17

5.1 Freixo Wastewater Treatment Plant (Porto)

http://www.ags.pt/servicos_operacao



- Operated by the private company, owned by the local and Japanese capital.
- Thickened sludge coefficient ca 30%.
- Average bill for the water and wastewater services for an average household (4 persons) is ca 15 EUR/month.
- Big confusion with the tariffs: 26 cents/m³ for water and 36 cents/m³ for wastewater. Looking at the volumes, we may assume that an additional fixed charged is added on top of these tariffs.
- Competition on the water and wastewater treatment plant operators market is very tough in Portugal.
- Treatment has two stages, the first is sedimentation and the second is biological treatment, followed by UV disinfection.
- Operating contracts are signed for 7 years. In the past, the operating contracts were signed for 3 years.
- Supposedly, the operator gets 10 cents/m³ from the wastewater treatment and the service is profitable.
- Wastewater treatment plant is owned by the local municipality (City of Porto).
- Thickened sludge is being handed over to the service provider who makes a compost out of it by mixing. The compost is used in agriculture.
- There are no wastewater pumping stations in the operating area of the treatment plant because the city is located up on the hill and the wastewater runs by the gravity to the wastewater treatment plant that is located in the lowest point of the landscape.
- The operator is also operating the local Porto Water Treatment Plant. Price for the operating service there is also 10 cents/m³.

5.2 Nova Sintra Water Reservoir



- The reservoir is situated at one of the highest points in the City of Porto.
- Water from the river is pumped to the reservoir.
- In some of the areas of the city the local municipality is testing remote water meters. Water meters cost ca EUR 100 + ... /pc. Battery lasts for two months.
- The water treatment plant operator pays to another company for the water it extracts from the river.
- The water reservoir and the water network are owned by the local municipality who is also operating the water network.
- The water supply points in Porto are situated 40 cm from the border of the plot, inside the customer's plot.

6. Day Four – 9.11.17

6.1 Maia/Prada Wastewater Treatment Plant – wastewater treatment



- Provides service to the region with ca 75,000 residents.
- The plant could be extended to provide service to ca 121,000 residents.
- Treated effluent is discharged into the river that runs next to the plant.
- Cost price of the wastewater treatment is 15 cents/m³. By adding the composting of sludge - 17 cents/m³. With the marketing costs - 18 cents/m³.
- The company is owned by the local municipality and does not generate profits.
- The process includes separation of gas, which covers the needs of the plant. The rest is sold to the local electricity company.

- For several times, the wastewater treatment plant has been flooded due to the high water level in the river that flows next to it, which means that the location of the plant has not been well designed originally.
- Flow volumes of the plant are ca 40 m³/hour.
- The effluent is charged by the volumes of it. It does not matter how small are the concentrations discharged into the environment and there are no limit concentrations set. The list of components that are monitored and charged is ca 3 pages long.

6.2 Maia/Prada Wastewater Treatment Plant – composting of sludge



- The plant is making two types of product – one for spreading everywhere, usually in home gardening, and the other product for using in agriculture.
- Three components of the product are monitored daily – these are the size of the fragments, humidity and a maintenance-based component.
- 50 litres of gardening soil costs EUR 3.3 EUR and the product sold to the farmers EUR 1.85.
- The compost comes in 50 l bags and big-bags and can also be calculated in m³ and transported with trucks.
- The compost is sold by ca 50% below cost. The operator gets compensated the cost through water and wastewater tariff.
- The compost is being sold for ca EUR 78,000/year.
- This is the only wastewater treatment plant in Portugal that produces certified compost.
- The certification process was done based on the extensive study, comparing two compost products in the potting tests.



7. Day Five – 9.11.17

Trip home

8. Annexes:

Links to the presentations:

<https://drive.google.com/file/d/1RrsWwbxZZVfmZRZBGcjQgTb2BqYeJ2lB/view?usp=sharing>

https://drive.google.com/file/d/1b1yGboU0db0-ZgF5bxalbScO7_BbQd6F/view?usp=sharing

https://drive.google.com/file/d/1cFtTd2F2YGkSetxANWuXiKAdF5frDQP_/view?usp=sharing

<https://drive.google.com/file/d/1YXuzgWxfmwubuwjY8-kDTN-oWaZrKkb/view?usp=sharing>

<https://drive.google.com/file/d/1q9hYLNmJLlbyVzjm4IDrqXjliWaOkqa/view?usp=sharing>