



# **Environmental protection report for 2019**

**JP Elektroprivreda BiH d.d. - Sarajevo**

Sarajevo

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# 1. POWER AND THERMAL ENERGY GENERATION

In 2019, JP Elektroprivreda BiH d.d. Sarajevo (hereinafter JP EP BiH), in its production facilities, achieved total electricity production amounting to **6.034 GWh**.

The Tuzla and Kakanj Thermal Power Plants produced 4.527 GWh (TPP Tuzla 2.759 GWh and TPP Kakanj 1.768 GWh), and the hydro power plants produced 1.507 GWh (HPPs on r. Neretva 1.444 GWh and sHPPs 63 GWh) (see Diagram 1).

Diagram 1. Electricity produced (GWh)

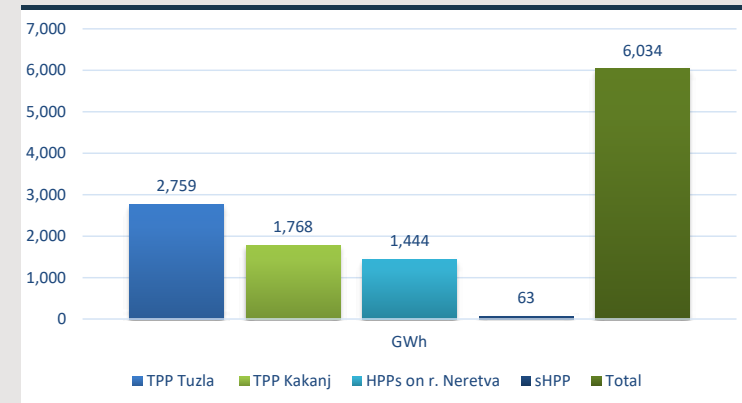
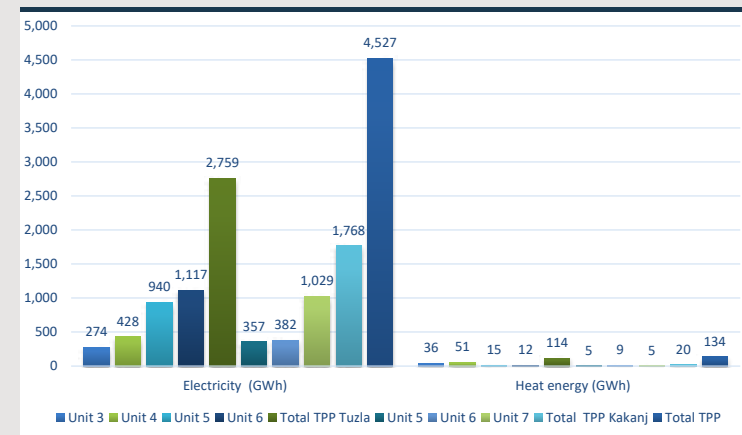


Diagram 2. Electricity and heat produced, by Units, in TPP Tuzla and TPP Kakanj (GWh)



A total of 4.904.260 t of coal were consumed in thermal power plants, of which 4.692.122 t for electricity production, 159.499 t for heat and process steam production, while 52.639 t refers to ullage and spillage. Out of the total quantities, 3.002.955 t (61,2%) were spent in TPP Tuzla, while the consumption in TPP Kakanj was realized in the amount of 1.901.305 t (38,8%).

The calorific value of coal consumed was a total of 11.846 (kJ/kg). The calorific value of coal used for the needs of operation of the TPP Tuzla was 11.585 (kJ/kg), and the calorific value of coal used in TPP Kakanj was 12.246 (kJ/kg).

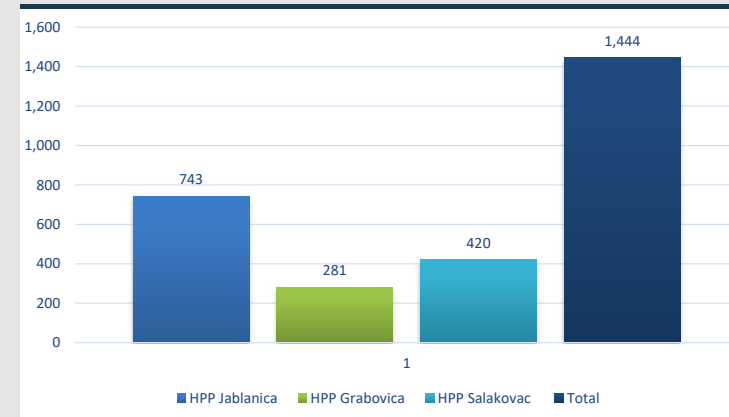
The total specific heat consumption in thermal power plants was 12.252 (kJ/kWh), with the specific consumption in TPP Tuzla of 11.887 (kJ/kWh), while in TPP Kakanj it was 12.824 (kJ/kWh).

A total of 2.358,7 t of crude oil and 1.591,2 t of fuel oil was used for ignition and supporting fire in thermal power plants, in boilers.

On the profiles of hydroelectric power plants on the river Neretva, including HPP Rama, natural water inflows amounted to a total of 2.427,0 GWh and were higher than planned by 261,2 GWh or 12,1%, and by 9,1 GWh.

From the aspect of the total realized amount of **natural** inflows, it can be concluded that the hydrological conditions in 2019 were relatively favourable.

Diagram 3. Electricity produced in HPPs on r. Neretva (GWh)

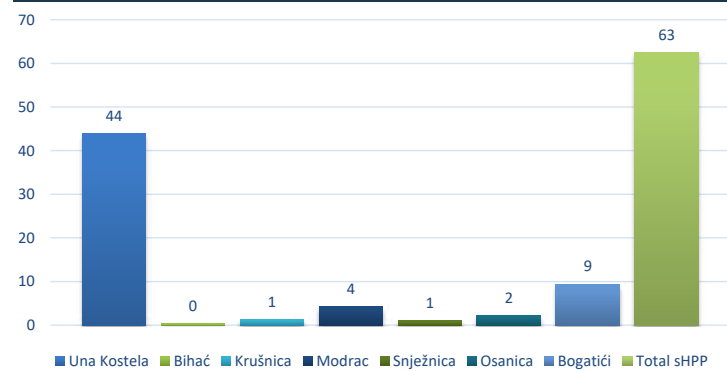


In 2019, 10.945 million m<sup>3</sup> of water were used in the Hydroelectric Power Plants on the river Neretva. Specifically, it was used in:

- HPP Jablanica 3.038,33 million m<sup>3</sup>
- HPP Grabovica 3.594,44 million m<sup>3</sup>
- HPP Salakovac 4.312,38 million m<sup>3</sup>.



Diagram 4. Electricity produced in sHPPs (GWh)



Operation of the electric power system of JP EP BiH in 2019 was characterized by:

- total electricity production was by 957,9 GWh or 13,7% lower than planned, and by 1.211,6 GWh or 16,7% lower than the realized production in 2018,
- the total realized natural water inflows were by 261,2 GWh or 12,1% higher than planned, and by 9,1 GWh or 0,4% higher than the realized inflows in 2018,
- the share of hydro power plants production in the total production was at the level of 25,0%, which is more favourable compared to the planned balance share of 21,4%;
- total coal purchases are less than the balance-planned quantities by 428,506 tons, i.e. by 7,4%, and by 460.061 tons or 7,9% less than the purchases in 2018,

- total electricity consumption is higher than the balance-planned by 110,3 GWh or 2,2%, and by 92,0 GWh or 1,8% higher than the total consumption in 2018;
- non-tariff sales of electricity are higher by 4,5 GWh, i.e. 0,2% than the balance-planned one, and by 708,3 GWh or 22,9% lower as compared to the non-tariff sales in 2018.

In terms of quantities and dynamics of electricity supply:

- all needs of end customers supplied by EPBiH were completely satisfied, in quantity of 4.807,6 GWh,
- contractual obligations related to the sales of electricity in the amount of 1.234,8 GWh were fulfilled,
- the total sale of electricity related to trade in the quantity of 937,6 GWh was realized,
- sales on the basis of contracts on business and technical cooperation were realized in the amount of 163,7 GWh,
- sales of electricity under realized imbalance and regulation in the amount of 42,0 GWh were realized.

## 2. BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

JP EP BiH, as part of its activities, continually monitors and analyses the impact of its business processes on the environment, in accordance with the current legislation in the field of environmental protection.

### AIR POLLUTANTS EMISSIONS FROM THERMAL POWER PLANTS

In accordance with the legislation in the field of air protection, JP EP BiH, during 2019, continued monitoring the air pollutant emissions from thermal power facilities – sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), solid particles, and carbon dioxide (CO<sub>2</sub>) emissions.

Total annual emissions of pollutants into air and CO<sub>2</sub> emissions from thermal power plants are given in Table 1.

Table 1 Emissions of pollutants into air and CO<sub>2</sub> emissions from TPP Tuzla and TPP Kakanj

| Power plant  | NO <sub>x</sub> | SO <sub>2</sub> | solid particles | CO <sub>2</sub>  |
|--------------|-----------------|-----------------|-----------------|------------------|
|              | t/yr            | t/yr            | t/yr            | t/yr             |
| TPP Tuzla    | 3.584           | 40.342          | 548             | 2.471.215        |
| TPP Kakanj   | 6.964           | 67.454          | 61              | 1.954.165        |
| <b>Total</b> | <b>10.548</b>   | <b>107.796</b>  | <b>609</b>      | <b>4.425.380</b> |

### CONSUMPTION OF WATER AND EMISSIONS INTO WATER IN THERMAL POWER PLANTS

Data on the amount of water consumed for generation of electricity, thermal power and process steam in thermal power facilities, as well as data on the total load of pollution of wastewater expressed in population equivalent (PE) are given in Table 2.

Table 2 Balance of water used and discharged for generation of electricity, thermal power and process steam in TPP Tuzla and TPP Kakanj

| Power plant | Used water     | Discharged water | Population equivalent (EBS) |
|-------------|----------------|------------------|-----------------------------|
|             | m <sup>3</sup> | m <sup>3</sup>   |                             |
| TPP Tuzla   | 8.889.747      | 707.912          | 27.360 ES                   |
| TPP Kakanj  | 9.508.642      | 4.245.092        | 20.312,85 ES                |

## TPP Tuzla

### WASTEWATER TREATMENT

TPP Tuzla, in accordance with the valid Water Permit (UPI-I/25-3-40-432-04/17), implements all necessary measures and activities (Action Plan).

Implementation of the Closed Wastewater Treatment project has had positive effects on the environment. The costs for water charges have been significantly reduced (the value of the wastewater pollution burden has been significantly reduced - see Table 2).

During the year, the Sava River Basin Agency regularly reported on the discharge of process wastewater and a special water fee was paid.

### RADIOACTIVITY MONITORING INDICATORS

In accordance with the Rulebook on Maximum Limits of Radioactive Contamination of The Environment and Performing Decontamination (Official Gazette of SFRY 8/87, Official Gazette of RBiH 2/92), a regular annual monitoring of radioactivity levels in the generation process and the nearby surroundings of the thermal power plants was realized.

The Faculty of Veterinary Medicine of Sarajevo carried out

the measurement of the radioactivity of slag and ash, and the measurement of radioactivity in the production process, and it was established that the levels of natural and artificial radionuclides in the samples do not exceed the established maximum permitted values. Radiological investigations of the ecological chain in the vicinity of TPP Tuzla were performed. The results of investigations of natural radionuclides in soil, plant cover, and plant and animal products at the location of the settlements Husino and Mihatovići, are within the average values for these types of samples.

## TPP Kakanj

### WASTEWATER TREATMENT

4.294.210 m<sup>3</sup> wastewater was treated at wastewater treatment plants. 23,187 m<sup>3</sup> wastewater was treated at the sanitary-faecal wastewater treatment plant. In the process of decarbonization, 44.505 m<sup>3</sup> of waste sludge was generated, while 1.588 m<sup>3</sup> of sludge was generated in the process of wastewater treatment at the wastewater treatment plant (WWT-coagulator). The amount of water discharged from the Hrasno coal depot was 6.595 m<sup>3</sup>. 5.683 m<sup>3</sup> of 15%-sludge was discharged from the sludge thickener at the Turbići slag and ash landfill.

Technical chemicals were used for the preparation of process water and for the wastewater treatment.

## RADIOACTIVITY MONITORING INDICATORS

Based on the conducted tests and the obtained results of the exposure dose

rate of gamma radiation, and the levels of natural and fission radionuclides in the soil, coal, ash and slag of TPP Kakanj, the Faculty of Veterinary Medicine in Sarajevo came to the following conclusions:

- TPP Kakanj shows, as in previous years, a slight impact on the environment in terms of increasing technologically conditioned natural radioactivity.
- The highest exposure rate of gamma radiation doses was measured at the Turbići landfill site (0.180  $\mu\text{Sv/h}$  - second measurement), and the lowest was measured in the thermal power plant circle (0.075  $\mu\text{Sv/h}$  - second measurement).
- The content of natural radionuclides (U-235, U-238, Th-232, Ra-226 and K-40) in coals, ash and slag from the plant and ash and slag at the Turbići landfill, are within the range of average values for these types of samples.
- The content of natural radionuclides (U-235, U-238, Th-232, Ra-226 and K-40) in ash and slag is 2 to 3 times

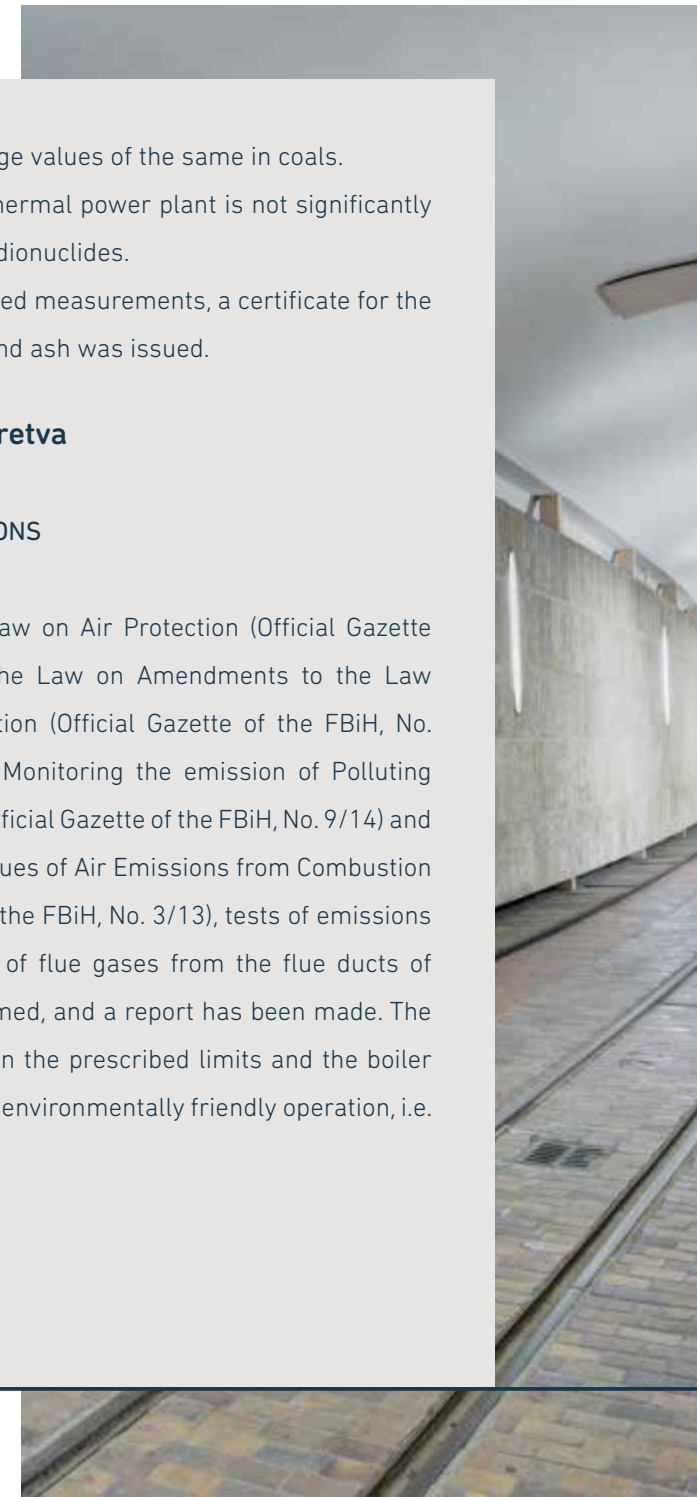
higher than the average values of the same in coals.

- The soil around the thermal power plant is not significantly contaminated with radionuclides.
- Based on the performed measurements, a certificate for the radioactivity of slag and ash was issued.

## HPPs on the river Neretva

### AIR POLLUTANTS EMISSIONS

In accordance with the Law on Air Protection (Official Gazette of the FBiH, No. 33/3), the Law on Amendments to the Law on Environmental Protection (Official Gazette of the FBiH, No. 38/09), the Rulebook on Monitoring the emission of Polluting Substances into the Air (Official Gazette of the FBiH, No. 9/14) and the Rulebook on Limit Values of Air Emissions from Combustion Plants (Official Gazette of the FBiH, No. 3/13), tests of emissions of pollutants into the air of flue gases from the flue ducts of boiler plants were performed, and a report has been made. The obtained results are within the prescribed limits and the boiler plants meet the criteria of environmentally friendly operation, i.e. environmental safety.





## WASTEWATER MONITORING

Sampling and testing of wastewater quality (monitoring) is performed in accordance with applicable legislation.

For the acceptance and treatment of wastewater from the sanitary blocks of the HPP Jablanica plant, a standard biological device for wastewater treatment has been installed on the plateau of the machine house. After treatment, the wastewater is discharged into the river Dobrinja, which flows into the Neretva, using a mechanical-biological process. Sampling of wastewater from the HPP Jablanica plant was performed twice at the discharge site (April and September) and according to the current regulations, all measured indicators are within the permitted limit values for wastewater discharge into the environment, i.e. natural recipient.

For the acceptance and treatment of wastewater from sanitary block and coffee kitchen of HPP Grabovica, two standard biological wastewater treatment plants were installed (SBR\_REG\_12 with capacity of 12 ES installed on the left bank, and SBR\_REG\_08 with capacity of 8 ES installed on the right bank of the Neretva River). After treatment, the wastewater is discharged directly into the river Neretva, using a mechanical-biological process. Sampling of wastewater from HPP Grabovica was performed twice at the discharge site on the right bank (April and September 2019) and according to current regulations, certain measured indicators were not within the permitted limits for wastewater discharge into the environment, i.e. the recipient in April,

while in September all measured indicators were within the permitted limit values for the discharge of wastewater into the environment, i.e. the natural recipient. On the left bank, wastewater sampling was also performed in April and September, where certain measured indicators were not within the permitted limit values for wastewater discharge into the recipient. In order to eliminate faults that lead to insufficient wastewater treatment, activities have been initiated to service wastewater treatment plants.

For the acceptance and treatment of wastewater from the HPP Salakovac, a standard biological wastewater treatment plant (type SBR\_REG\_20 with capacity of 20 ES) was built, which was placed on a free surface in front of the machine room (dam) on the left bank of the Neretva River. After treatment, the wastewater is discharged directly into the river Neretva, using a mechanical-biological process. Sampling of wastewater from the HPP Salakovac plant was performed twice at the discharge site (April and September) and according to the current regulations, certain measured indicators were not within the permitted limit values for wastewater discharge into the environment. In order to eliminate faults that lead to insufficient wastewater treatment, activities have been initiated to service wastewater treatment plants in the HPP Salakovac plant.

## NOISE AND VIBRATION

Noise level measurements (noise generation in day and night operation) of HPP Jablanica, HPP Grabovica and HPP Salakovac were performed in accordance with applicable legislation and bylaws. Measurements were made in June, and a report was made on the measurement of environmental noise levels for all three plants. All measured indicators meet the criteria of environmentally acceptable work.

## ED Tuzla

A Building Permit was obtained for the project of construction of a new Central Storage for Hazardous and Non-Hazardous Waste and a tender for the procurement of the service of construction of the same was announced. Additional waste collection bins were procured.

The water quality was tested at the outlet of the two separators in the business circle.

Procurement and installation of arm meters and seismographs on the "Sniježnica" dam facility was performed.

The development of the Preliminary and Main Designs for the rehabilitation of the landslide on the right side of the "Sniježnica" dam has been completed. The procurement procedure for the external revision of the Main Design has been initiated.

## ED Sarajevo

### ACTIVITIES IN ACCORDANCE WITH REGULATIONS IN THE FIELD OF WATER PROTECTION

Based on the concession agreement for sHPP "Osanica 1", concluded with the Government of the Bosnian-Podrinje Canton Goražde, an annual fee of 8% of the total revenue from electricity production shall be paid.

## ED Zenica

In order to mitigate the negative impact on the environment and increase the safety of electric power facilities, in order to prevent a large-scale accident, the service of regular maintenance of the building was performed (construction and craft works on the rehabilitation of transformer substations). Rehabilitation of transformer substations was carried out in accordance with technical recommendations that include environmental protection measures.

In order to increase the reliability of the route and reduce the number of outages at power facilities, the forest was cut through-down below the route of the electricity distribution network.

### WASTE MANAGEMENT IN JP EP BIH

Within the framework of the waste management system in the JP EP BiH, all laws and by-laws related to the area of waste management are applied. In 2019, our company continued improving waste management system, by investment in the existing temporary waste storages at production subsidiaries, as well as by continuing the Project for construction of temporary waste storages in power distribution subsidiaries, until its final disposal.

A total of 2.136 t of non-hazardous waste was produced in the facilities of JP EP BiH. TPP Kakanj produced 1.100,8 t, TPP Tuzla 568 t, HPPs on r. Neretva 65,8 t. A total of 401,7 tonnes was produced in the power distribution subsidiaries (power distributions: Sarajevo, Tuzla, Zenica, Bihac and Mostar).

subsidiaries (power distributions: Sarajevo, Tuzla, Zenica, Bihać and Mostar)

The total amount of hazardous waste, produced in JP EP BiH is 59,1 tons. TPP Kakanj produced 12,3 t, TPP Tuzla 3,2 t, HPPs on r. Neretva 8,6 t. A total of 35 tonnes was produced in the power distribution subsidiaries (ED Sarajevo, ED Tuzla, ED Zenica, ED Bihać and ED Mostar).

The total quantity of slag and ash generated in TPP Tuzla and TPP Kakanj is 1.182.654 t, of which 477.539 t were delivered, and the rest was disposed of at the slag and ash landfill.

Entire waste collected from JP Elektroprivreda BiH was handed over to authorized companies for the collection, transportation, treatment and export of the same, until its final disposal.

## **WASTE MANAGEMENT IN ED SARAJEVO**

In ED Sarajevo, the Main Design for the reconstruction of the temporary waste storage at the site of TS Azot 1 Vitkovići, Municipality of Goražde was done. In February, the Contract was concluded with the authorized legal entity for the revision of the Main Design for the Reconstruction of the Warehouse for Temporary Waste Storage at the site of TS Azot 1 Vitkovići, Municipality of Goražde. A certificate of the carried-out revision was issued in July. The decision on the building permit was issued by the City of Goražde in October.

At the end of 2019, activities were initiated for the procurement of the service

of external supervision of the reconstruction of the temporary waste storage in Goražde.

Contracts have been signed for the sale of secondary raw materials and waste materials, as well as the disposal of hazardous waste.

The discarded electrical and electronic equipment was handed over by ED Sarajevo to the authorized operator of the waste electrical and electronic equipment management system for further processing and disposal.

The State Regulatory Agency for Radiation and Nuclear Safety has issued a decision approving the removal and storage of ionizing smoke detectors. In December, it was removed and stored. The procurement of the missing upper end pallets in the temporary storage warehouse Azići was realized. Environmental protection agents (absorbents) were also procured.

At sHPP „Osanica 1“, regular cleaning of the bed of the river Osanica and maintaining of water intake were performed.

## **WASTE MANAGEMENT IN ED TUZLA**

A Building Permit was obtained and a tender for the procurement of the construction of a new Central Storage for Hazardous and Non-Hazardous Waste was announced in December.

Additional waste collection bins were procured.

The service of hazardous waste disposal and sale of secondary raw materials and waste materials is continuously contracted.



The water quality was tested at the outlet of the two separators in the business circle at the location of Mitra T. Uče next to no.5, Tuzla.

The restocking of the Sniježnica water reservoir was carried out. Procurement and installation of arm meters and seismographs on the Sniježnica dam facility was performed.

The development of the Preliminary and Main Designs for the rehabilitation of the landslide on the right side of the Sniježnica dam has been completed. The procurement of the external service for revision of the Main Design is in progress.

#### **WASTE MANAGEMENT IN ED ZENICA**

In 2019, the waste was handed over to the authorized system operator for the sale of secondary raw materials and waste materials. The discarded electrical and electronic equipment was also handed over to the authorized operator of the waste electrical and electronic equipment management system for further processing and disposal.

#### **WASTE MANAGEMENT IN ED BIHAĆ**

In 2019, Elektroprivreda Bihać initiated the procurement procedure for the service - Development of the Main Design

with revision for the construction of temporary waste storage at the site of the Central Warehouse "Vedro Polje". The contract with the designer was concluded in December 2019. Subsidiary "Elektrodistribucija" Bihać continuously contracts the sale of secondary raw materials and waste materials, as well as hazardous waste disposal services.

In 2019, the discarded electrical and electronic equipment was also handed over to the authorized operator of the waste electrical and electronic equipment management system.

#### **RESTOCKING OF HPPS ON THE RIVER NERETVA**

In the HPPs on the river Neretva, the procurement of fingerlings/fish is planned according to the Annual Fishery Improvement Programs for 2019, submitted by the associations of sport fishermen who exercise the right to manage the fishing areas of Konjic, Jablanica, Mostar and Prozor.

Procurement Review Body of BiH, resolving as per Complaint of the bidder PD Riba Neretva, d.d. Konjic declared against the tender documentation in the procedure of public procurement of indigenous species of fingerlings/fish for the Neretva River basin, issued a Decision on the annulment of the tender documentation of this tender procedure. Accordingly, the procurement of indigenous species of fingerlings/fish intended for restocking the Neretva River Basin was not performed.

According to the submitted annual programs for the improvement of fishery for 2019, the procurement of an indigenous species of fingerlings - carp fish was contracted and the fishing areas of Jablanica and Mostar were stocked. For non-indigenous species of fingerlings/fish: lake trout, Arctic charr, and rainbow trout, contracts have been signed for the supply of these species of fingerlings/fish. The realization of the contract is expected in 2020.

### **Power distribution subsidiaries**

In **ED Tuzla**, restocking of the hydro reservoir Sniježnica was carried out with the required quantity and type of fingerlings/fish from the Fishing Basis of the Fishermen's Associations of the mentioned area.

In **ED Bihać**, the annual restocking of the rivers Una and Krušnica is regularly carried out. In accordance with the Agreement on the Improvement of the Fish Stock in the Krušnica River Basin, the fishing area of the Municipality of Bosanska Krupa was restocked with 20.640 pieces of brown trout.

The obligation under the Contract is a 60% participation in the annual restocking of the Krušnica river basin, i.e. the acquisition of the fingerlings /fish for restocking of the Krušnica river in 2019, which is proportional to the estimated damage caused to the natural balance of this ecosystem and to the fish stock by the operation and maintenance of the sHPP Krušnica Bosanska Krupa.

Also, in cooperation with USR Una Bihać, and on the basis of the Agreement on the Improvement of the Fish Stock in the Una river basin, the Una river was restocked with 90.000 pieces of brown trout.

In **ED Sarajevo**, the annual restocking of the Osanica river in Goražde (the facility of sHPP Osanica 1), in accordance with the contract, was carried out in 2019. Considering the free water flow and unobstructed fish migration, on the River Željeznica, on the profile of Bogatići dam for the purpose of remediation of landslides, there was no restocking in 2019.

### **Use of transformer oil in Power Distribution Subsidiaries (EDs)**

#### **ED SARAJEVO**

In the normal course of the process of repair and maintenance of transformer substations and transformers, in the Canton of Sarajevo and Bosnia-Podrinje Canton Goražde, 3.868 kg of non-chlorated insulating oil and heat transfer oil based on mineral oil was spent (13,9% less oil in 2019 compared to 2018).

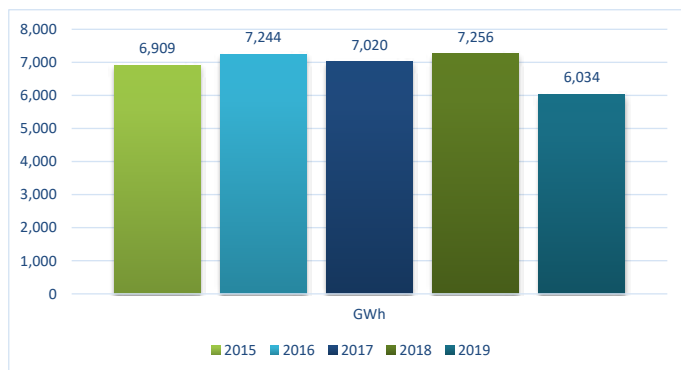
#### **ED BIHAĆ**

The Subsidiary Elektrodistribucija Bihać does not have a transformer repair workshop. In the course of the regular process, i.e. carrying out the maintenance of the transformers and the low-oil switches within the OmiP Sector, the electro-isolating transformer oil was supplemented, and 640 kg was consumed (approximately 25% less oil in 2019 compared to 2018).

In the Activity of electricity production, within the process of production and maintenance of power facilities in hydro power plants, biodegradable hydraulic oils (HD 68) and grease (LIS 2) were used. The General Affairs and Transport Service uses motor hydraulic oils and antifreeze. For new vehicles, which are regularly serviced, the oil is replaced by an authorized service centre. Oil change in working machines is also done in the service or workshop of the company. Used oil is temporarily deposited and also prepared for final disposal. No cases of uncontrolled oil spillage have been recorded.

### 3. TREND OF ENVIRONMENTAL IMPACT INDICATORS 2015 – 2019

Diagram 5. Total electricity generation in the facilities of JP EP BiH for the period 2015 – 2019 (GWh)



### TPP Tuzla and TPP Kakanj

Diagram 6. Electricity generation in TPP Tuzla and TPP Kakanj for the period 2015 - 2019 (GWh)

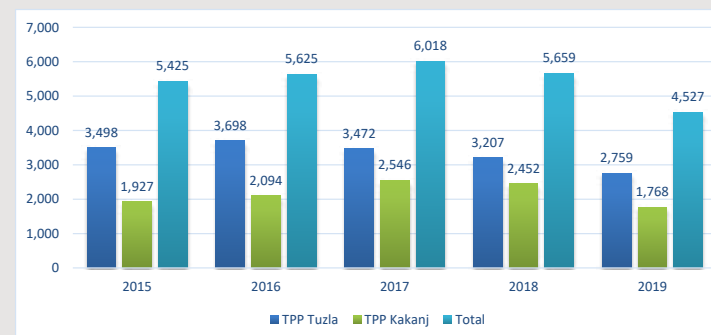


Diagram 7. Coal consumption in TPP Tuzla and TPP Kakanj for the period 2015 - 2019 t

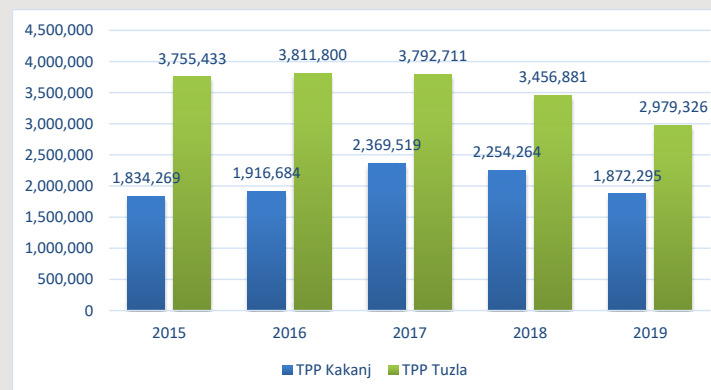


Diagram 8. Emission of SO<sub>2</sub> from thermal power plants Kakanj and Tuzla for the period 2015 – 2019. (t)

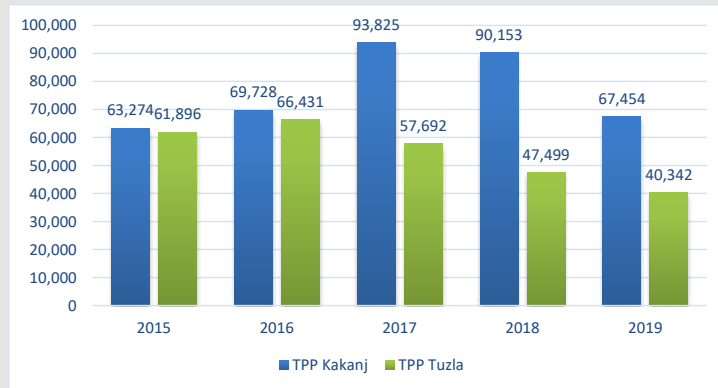


Diagram 9. Emission of NOx from TPP Tuzla and TPP Kakanj for the period 2015 – 2019. (t)

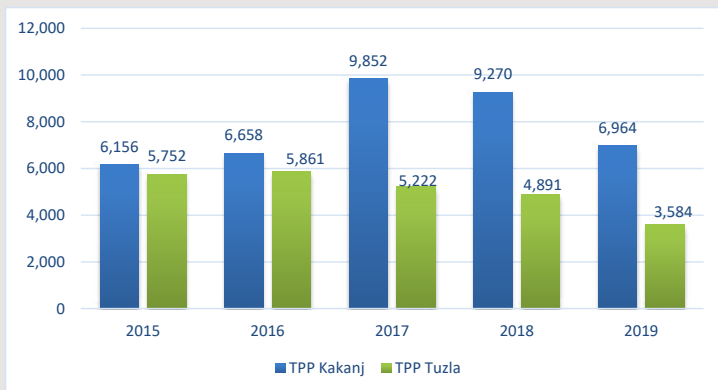


Diagram 10. Emission of solid particles from TPP Tuzla and TPP Kakanj for the period 2015 – 2019. (t)

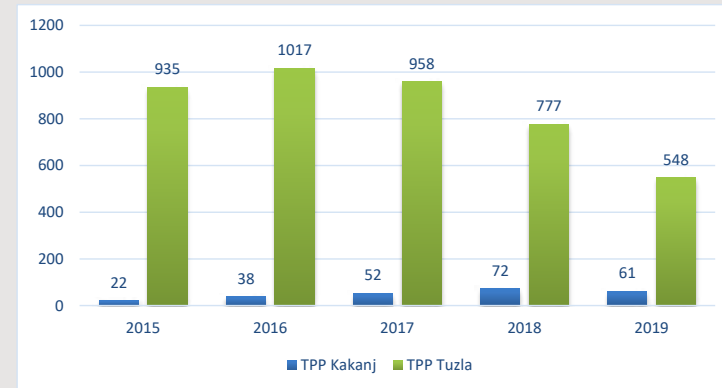


Diagram 11. Emission of CO<sub>2</sub> from thermal power plants Kakanj and Tuzla for the period 2015 – 2019. (t)

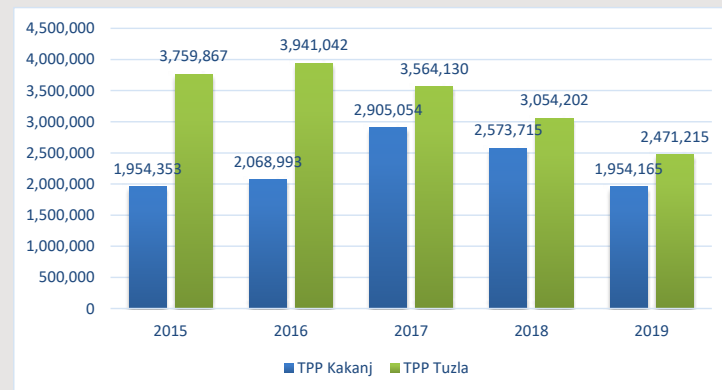


Diagram 12. Total quantity of non-hazardous waste and hazardous waste\* in TPP Tuzla and TPP Kakanj for the period 2015 – 2019. (t)

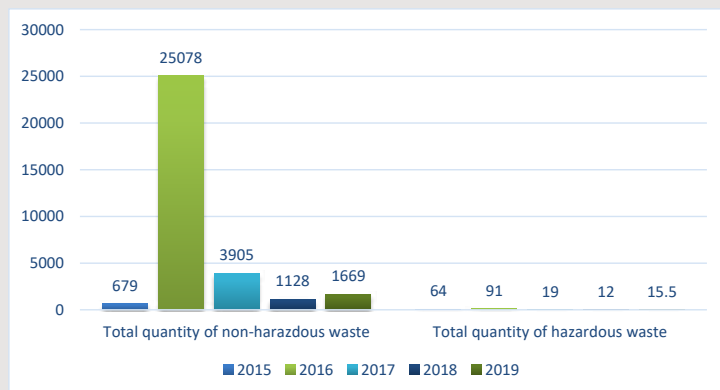
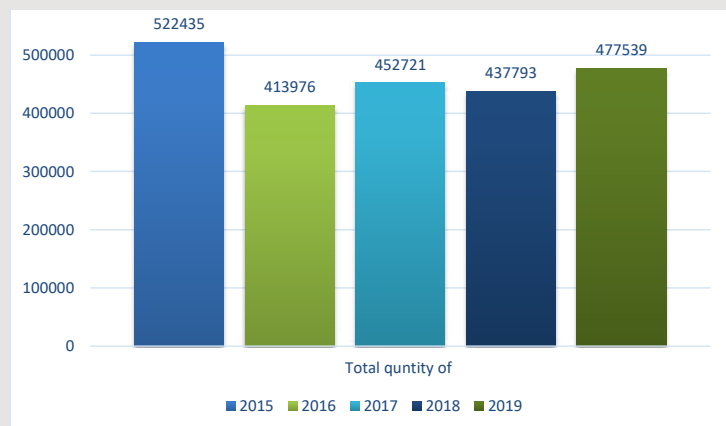


Diagram 13. Total quantity of delivered slag and ash in TPP Tuzla and TPP Kakanj for the period 2015 – 2019. (kt)



### Hydro Power Plants on River Neretva

Diagram 14. Electricity generation in hydro power plants for the period 2015 – 2019 (GWh)

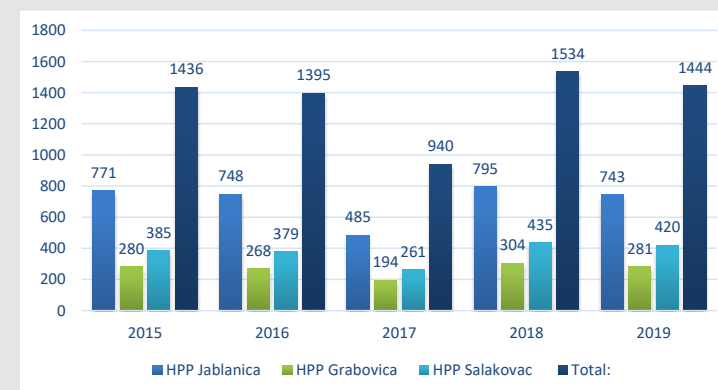


Diagram 15. Quantity of water used for electric power generation in hydropower plants for the period 2015 - 2019 (million m<sup>3</sup>)

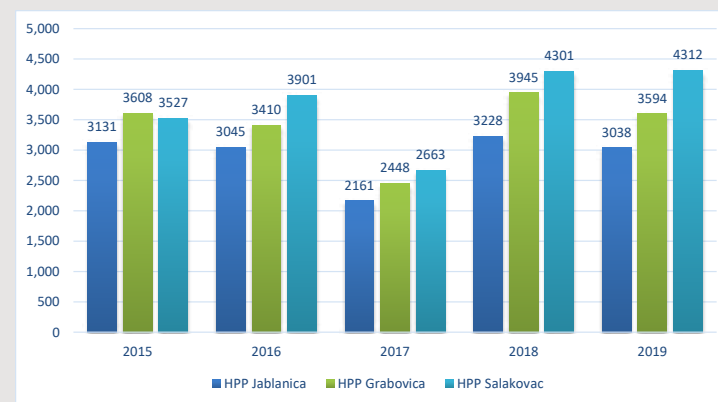
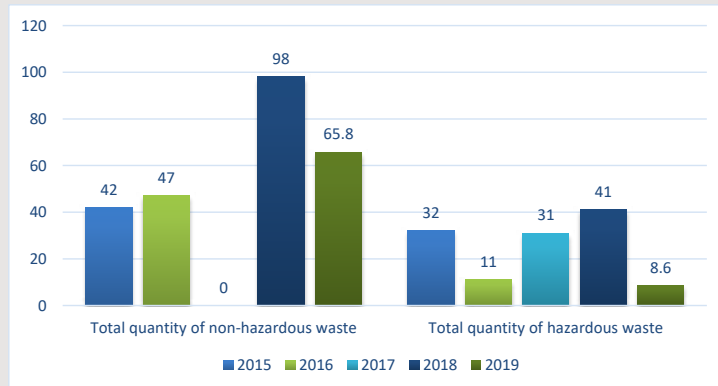


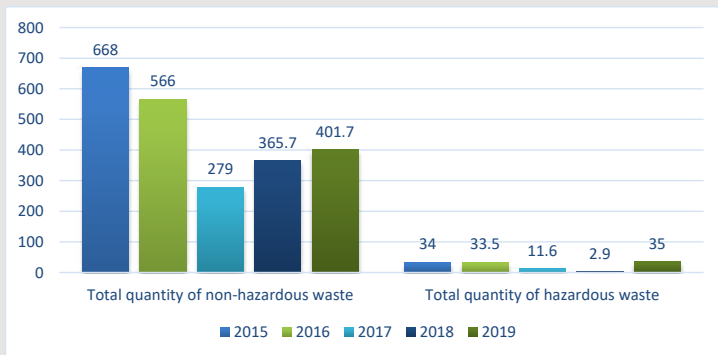


Diagram 16. Total quantity of non-hazardous waste and hazardous waste\* in hydro power plants for the period 2015 – 2019. (t)



### Power distribution subsidiaries

Diagram 17. Total quantity of non-hazardous waste and hazardous waste\* in distribution subsidiaries: Sarajevo, Tuzla, Bihać, Zenica and Mostar, for the period 2015 - 2019. (t)



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## 4. REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

### Thermal power plants

TPP Tuzla and TPP Kakanj implement all imposed measures from valid environmental and water permits, as part of their regular activities.

#### TPP TUZLA

- Measurement of the content of particulate matter at the landfills of combustion products Divkovići I Jezero

In the period from 27 August - 22 September 2019, a continuous measurement of the concentration of particulate matter at the landfills of combustion products was performed in two time periods of 7 days each. The measurement

was performed in accordance with the obligations from the valid Environmental Permit, using a mobile measuring station equipped with an analyser for measuring PM10 emission concentrations and meteorological data. Based on the obtained results, it was established that the concentrations of particulate matter do not exceed the limit values at any of the examined locations, in accordance with the Rulebook on the Manner of Performing Air Quality Monitoring (Official Gazette of FBiH, No. 01/12).

#### TPP KAKANJ

- An Environmental Permit has been obtained for the construction of a flue gas desulphurisation and denitrification plant.
- A Feasibility Study for the construction of a desulphurization plant for Unit 7 has been prepared and funds have been planned for the construction of a flue gas desulphurization plant for Unit 7.
- Reduction of noise emission level from the bridge for external coal supply was completed.
- Fencing of the landfill has been mostly completed and access to the landfill to third parties has been mostly disabled, video surveillance and physical surveillance in the first shift have been set.



## HYDRO POWER PLANTS ON RIVER NERETVA

The Federal Ministry of Environment and Tourism has issued environmental permits for:

- HPP Jablanica plant no.: UPI 05/2-23-11-65/19 of 14 June 2019,
- HPP Grabovica plant no.: UPI 05/2-23-11-67/19 of 14 June 2019,
- HPP Salakovac plant no.: UPI 05/2-23-11-66/19 of 14 June 2019,

According to valid environmental permits, the following activities are regularly conducted.

- Protection of water quality
- Protection of air quality
- Waste management
- Minimizing negative impacts produced by noise
- Minimizing negative impact on fauna
- Minimizing other negative impacts on the environment

## Power distribution subsidiaries

### ED SARAJEVO

The conditions from the Environmental Permit for sHPP Osanica 1 in Goražde are observed (environmentally acceptable flow) and environmental protection measures are implemented.

### ED TUZLA

The conditions from the valid environmental and water permits for the sHPP Modrac in Lukavac and the sHPP Snježnica with hydro reservoir in Teočak are observed. Accordingly, the following is performed:

- regular observation of dams and reservoir, control of working parameters, visual control of erosive processes,
- technical, geodetic and physical observation of the dam,
- selective separation of waste and keeping records of produced waste quantities,
- restocking of hydro reservoir Snježnica, once a year,
- testing and evaluation of physical and chemical parameters of water quality.

According to the obligations from the valid water permit for the Snježnica dam and hydro reservoir, the Main Design for

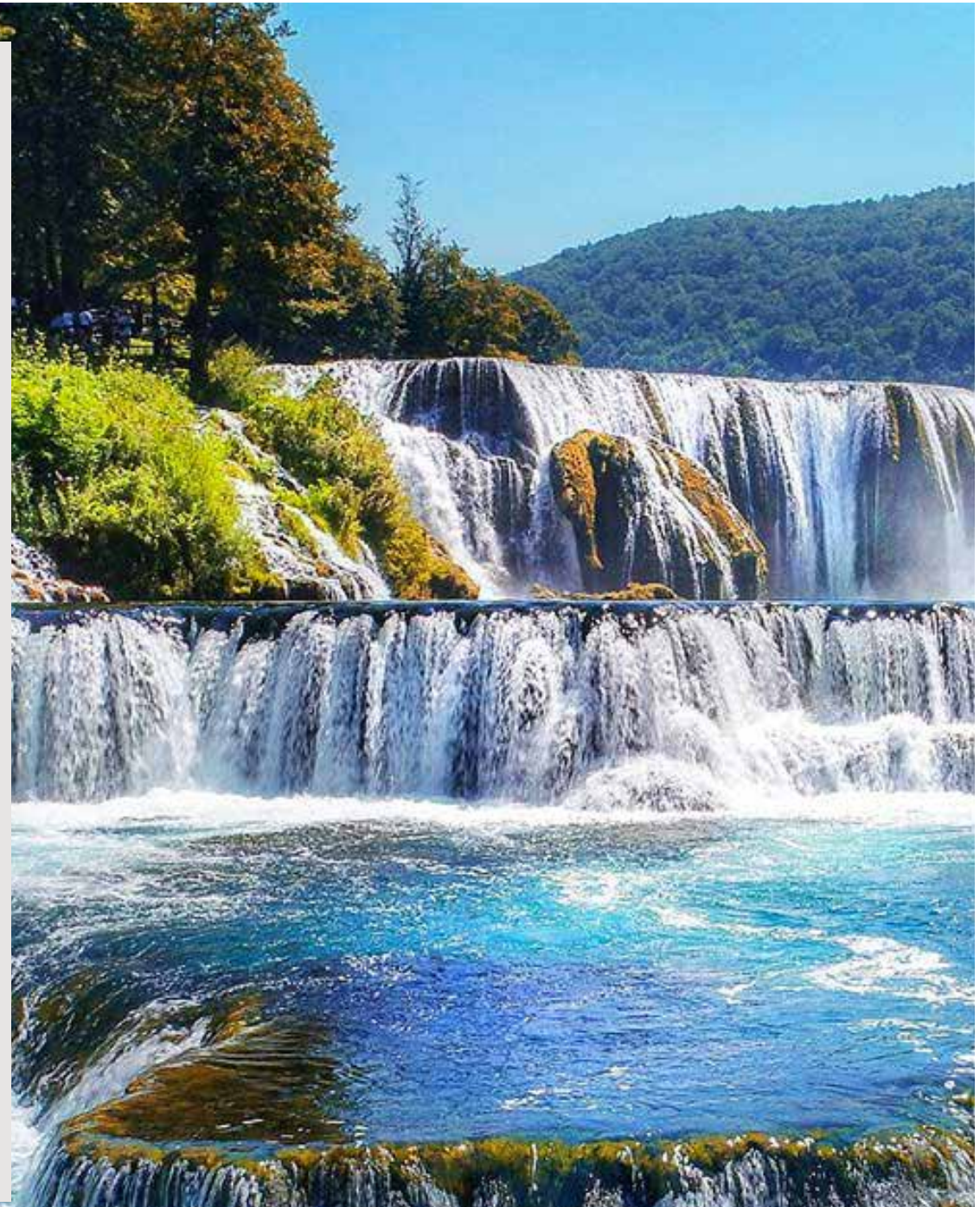
the construction of the septic tank has been completed and the Investment Decision has been made, and the public procurement procedure for the delivery and installation of the septic tank is in progress.

During 2019, the procurement and installation of arm-meters and seismographs was completed, and the procurement procedure for the revision of the Main Design of Landslide Rehabilitation on the right side of the Dam was initiated.

The Ministry of Physical Planning and Environmental Protection of Tuzla Canton has confirmed the exemption from the obligation to renew environmental permits for overhead lines over 1 kV, after the expiration of their validity. The explanation states that permits are issued only for the construction of these power facilities, so that it is not necessary to re-issue permits for the purpose of exploitation.

#### **ED BIHAĆ**

In 2019, the Federal Ministry of Environment and Tourism issued an Environmental Permit for the facility of HPP Una Kostela, Bihać, with a validity period of five (5) years. According to the valid environmental and water permits for other facilities, sHPP Bihać, Bihać, and sHPP Krušnica, Bosanska Krupa, the ordered activities are carried out regularly.



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## 5. ENVIRONMENTAL MANAGEMENT SYSTEM

### TPP Tuzla

Internal audits were conducted within the Integrated Management System. According to the obtained results, the need for implementation of corrective actions and improvements in certain processes has been reduced.

The control audit of the Integrated Quality and Environment Business Management System was carried out according to the requirements of ISO 9001:2015 and ISO 14001:2015.

### TPP Kakanj

TPP "Kakanj" has a valid certificate of compliance of the Environmental Management System with the requirements of the BAS EN ISO 14001:2017 standard.

Harmonization of the existing Environmental Management System with the requirements of the new standards implied the modification of existing documents of the Environmental Management System, maintenance and achievement of the following principles:

- That employees are constantly familiarized with the importance of meeting the environmental legal requirements.
- That the environmental policy has been defined and published.
- That the environmental goals have been defined and published.

### Hydro Power Plants on River Neretva

The Program to improve the Integrated Management System (IMS) was developed in 2019, on the basis of which the following activities were carried out:

- the ISU documents (Management review) were reviewed by the management,
- Internal audit was carried out in all plants and sectors,
- an analysis of environmental aspects, that relate to the process of power generation in facilities/sectors was carried out,

- assessment of compliance of work with legal and other environmental requirements was carried out,
- environmental goals and quality goals have been developed.
- The Report on 2nd Supervisory Audit of the Integrated Management System was produced, according to the requirements of ISO 9001:2015 and ISO 14001:2015.
- 14001:2015.

## ED Tuzla

The Supervisory Audit of Environmental Management System BAS EN ISO 14001 was completed in 2019, with an audit of the System according to ISO 9001, which together constitute the Integrated Management System - IMS. The Subsidiary continuously work to improve the relationship with the environment, through a systematic approach to waste management, control of environmental aspects, identification and implementation of legal regulations, fulfilment of set environmental objectives, and corrective actions.

The environmental management, that is recognized as a separate process, was evaluated in terms of determining the context of organization and potential risks, and measures for identified risks and opportunities were considered.



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## 6. ENVIRONMENTAL PROTECTION WITHIN THE DEVELOPMENT OF ELECTRIC POWER FACILITIES

### TPP Tuzla

- Preparatory activities for reclamation of Divkovići and Plane combustion products landfills

Following the rejection of TPP Tuzla's application for an Environmental Permit, the Federal Ministry of Environment and Tourism (FMoET) and the Federal Environmental Inspector ordered the preparation of a new Environmental Impact Assessment Study and Rehabilitation Plan. TPP Tuzla has hired the company Enova d.o.o. Sarajevo, (which is on the list of developers of the Environmental Impact Study) to prepare new documentation in the renewed procedure for obtaining the Environmental Permit. The Study was prepared and a Public Consultation was held. After the

Public Consultation held by FMoET, additional documentation was requested on 11 October 2019. The documentation was supplemented by the company Enova d.o.o., and it was submitted to FMoET on 11 December 2019. On 22 January 2020<sup>1</sup>, the FMoET issued a Conclusion on the termination of the procedure (for the second time), for the issuance of the Environmental Permit for the closure of the slag and ash landfill Plana and Divkovići. The explanation states that the interested public again submitted objections to the supplemented documentation.

### TPP Kakanj

- An Environmental Permit has been obtained for the construction of a flue gas desulphurisation and denitrification plant.
- The Water Permit for water catchment and discharge of process wastewater from TPP Kakanj has been obtained.
- A Justification Report for the construction of the flue gas desulphurization plant for Unit 7 was prepared.
- Funds have been planned for the construction of a flue gas desulphurization plant for Unit 7.

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<sup>1</sup> The information is not within the reporting period but it has been presented for the sake of clarification and understanding of the situation

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## 7. CAPITAL INVESTMENTS

### **Hydro Power Plant Babino Selo**

The final Environmental Impact Assessment Study for HPP Babino Selo was prepared - Assessment of critical habitats in the project area of the Vrbas River planned for construction of HPP Babino Selo. Continuous monitoring of underground water levels was continued on installed piezometers until 31 June 2019.

### **Hydro Power Plant Janjići and Hydro Power Plant Kovanići**

Continuous monitoring of groundwater levels on installed piezometers was continued.

For HPP Kovanići, a contract was signed for the preparation of the Environmental Impact Assessment Study.

### **Hot-water pipeline for heating energy supply from TPP Kakanj to/including Sarajevo**

Investment and technical documentation was prepared "Preliminary Design of Thermal Energy Supply from TPP Kakanj to/including Sarajevo.

### **Wind Power Plant Podveležje**

As part of the implementation of the WPP Podveležje construction project, for the LOT2 project component, in 2019 the Environmental and Social Management Plan (ESMP) was completed and approved for further use in the implementation of the LOT2 project component.



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## 8. PREPARATION OF PLANNING AND STUDY DOCUMENTS

In the segment of study and planning documents in 2019, the following projects/studies were implemented:

### Development Projects:

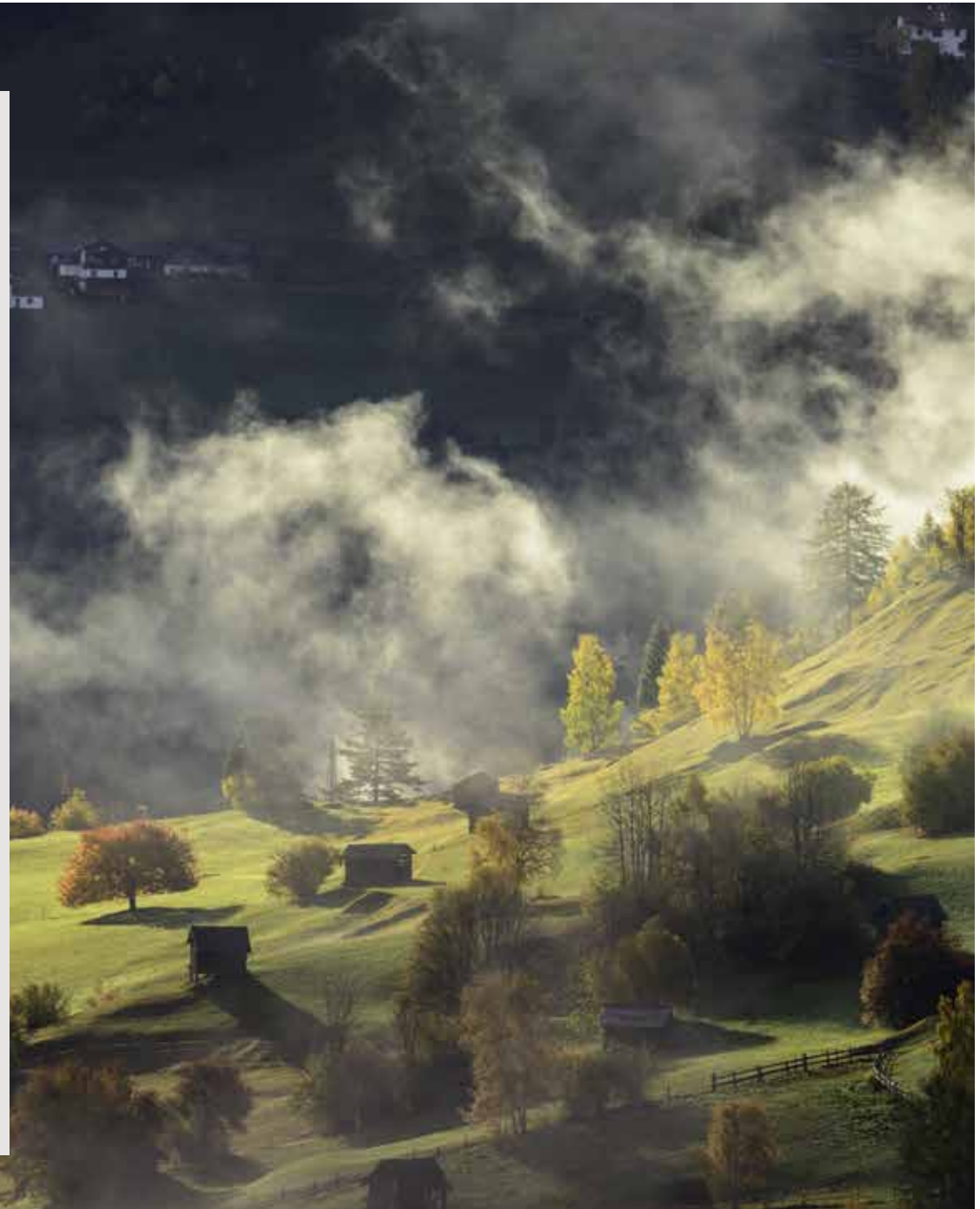
- Upgrade DH Project (Horizon 2020) - Improving energy efficiency of existing under-efficient district heating systems in Europe (participation of EPBiH as the bearer of a demonstration case of improvement of district heating systems Tuzla, with specific goals of reducing primary energy consumption by 20%, reducing CO<sub>2</sub> emissions by 20% and the introduction of RES in DHS Tuzla with a share of 20%).
- BIOFIT Project (Horizon 2020) - Retrofit of the European industry by introducing biofuels (participation of EPBiH in the demonstration case of full conversion to biomass of

opt-outed Unit 5 of TPP Kakanj (118 MWe) and demonstration case of introducing co-firing with biomass (0-30%) on Unit 6 in TPP Tuzla (224 MWe).

- Project of campaign for wind- and solar power potential measurement (examining wind power potential and solar power potential in several locations across Bosnia and Herzegovina with the aim of identifying suitable locations for the construction of production facilities on these renewable resources),
- The WPP Bitovnja Project (preparation of investment and technical documentation, with Baseline study of bird and bat fauna, as well as the of the Study of Environmental and Social Impact of the future WPP Bitovnja).
- ELEMEND project - Smart network curricula, which include special areas of different renewable energy technologies, integration of renewable sources into the power grid, energy efficiency, energy management, etc. (participation of EPBiH as an industrial partner to ensure that curricula match realistic needs of the industry).
- Electromobility Development Project in EPBiH - direct contribution to the reduction of harmful emissions into the air due to the use of electric vehicles instead of internal combustion vehicles, for which the precondition is the construction of infrastructure for charging electric vehicles.

### Planning and Study documents:

- Perspective of the new business development of JP Elektroprivreda BiH d.d. - Sarajevo in the electric vehicle charging sector - indirect contribution through the creation of conditions for doing business in charging electric vehicles, which reduce harmful emissions into the air, due to the use of electric vehicles, instead of vehicles with internal combustion.
- Justification of the construction of a photovoltaic power plant in the area of Podveležje (Terms of Reference have been prepared).
- Analysis of tax schemes for CO<sub>2</sub> emissions with the proposal of the optimal sustainable scenario for EPBiH (the initial Study is being prepared).
- Electricity distribution system development plan until 2030.



## 9. COSTS IN ENVIRONMENTAL PROTECTION

In the JP Elektroprivreda BiH, for the time being, no special records are kept on investments and costs for implementation of plans and programs in the domain of environmental protection and natural resources. Funds are planned and realized in the framework of investments and regular maintenance of plants and facilities. There is no harmonized procedure for presenting objective indicators of total costs in realized activities, which includes the fees for the use of natural resources. Therefore, it is difficult to provide safe and complete data on total spent funds of JP Elektroprivreda BiH d.d. – Sarajevo, in that context. According to the data available for the preparation of this document, the total amount is 37,799,098 KM. This indicator is a confirmation that environmental protection is an important part of the total business of our company also in financial aspect.

The Table 5, according to available data, provides costs of environmental protection by subsidiaries, at the level of the Company Directorate, and the total for JP Elektroprivreda BiH d.d. – Sarajevo.

Table 5 Environmental Protection Costs in the Domain of Environmental Management

| Organization   | (KM)  |
|--|---|
| <b>Subsidiaries</b>  |   |
| TPP Tuzla  | Investments fees and services=<br>4.751.614 |
| TPP Kakanj   | 1.603.034                                   |
| HPPs on the Neretva River  | 1.693.488                                   |
| ED Sarajevo  | 374.401                                     |
| ED Tuzla   | 734.362                                     |
| ED Zenica  | 957.154                                     |
| ED Bihać   | 386.203                                     |
| ED Mostar  | 4.748                                       |
| Fee for air pollution of TPP Tuzla   | 1.755.749                                   |
| Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP | 4.157.318                                   |
| Fee for water protection   | 94.952                                      |
| Fee for air pollution of TPP Kakanj  | 2.891.046                                   |
| Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP | 3.017.357                                   |
| Fee for water protection   | 285.259                                     |
| Contributions for hydro reservoir (HPP on river Neretva)                                   | 14.080.350                                  |
| Fee for water protection HPP on river Neretva  | 5.547                                       |
| <b>Company Directorate</b>   |   |
| Sector for strategic development   | 288.625                                     |
| Capital investments  | 622.022                                     |
| Water charges and communal utilities Water charges and utilities services                  | 95.869                                      |
| <b>TOTAL:</b>  | <b>37.799.098</b>                           |