



ENVIRONMENTAL PROTECTION REPORT FOR 2020

JP ELEKTROPRIVREDA BIH D.D. - SARAJEVO

SARAJEVO, JUNE 2021

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POWER AND THERMAL ENERGY GENERATION

In 2020, JP Elektroprivreda BiH d.d. Sarajevo (hereinafter JP EP BiH), in its production facilities, achieved total electricity production amounting to **6,237.9 GWh**. The Tuzla and Kakanj Thermal Power Plants produced 5.155.8 GWh (TPP Tuzla 3,124.2 GWh and TPP Kakanj 2,031.6 GWh), and the hydro power plants produced 1,082.1 GWh (HPPs on r. Neretva 1,024.1 GWh and sHPPs 58.0 GWh) (see Diagram 1).

Diagram 1. Electricity produced (GWh)

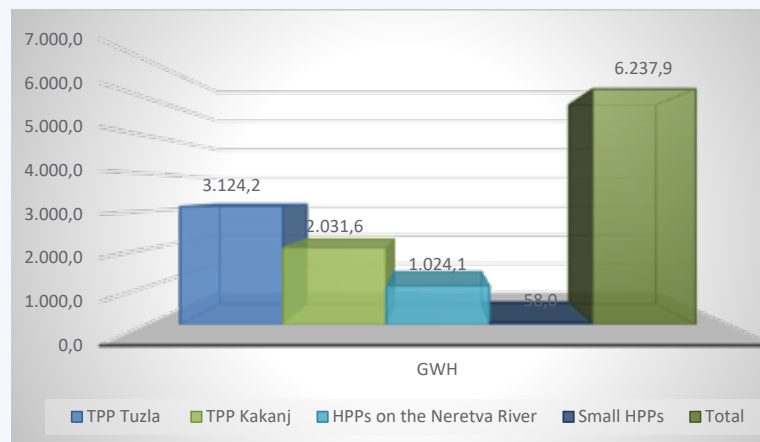
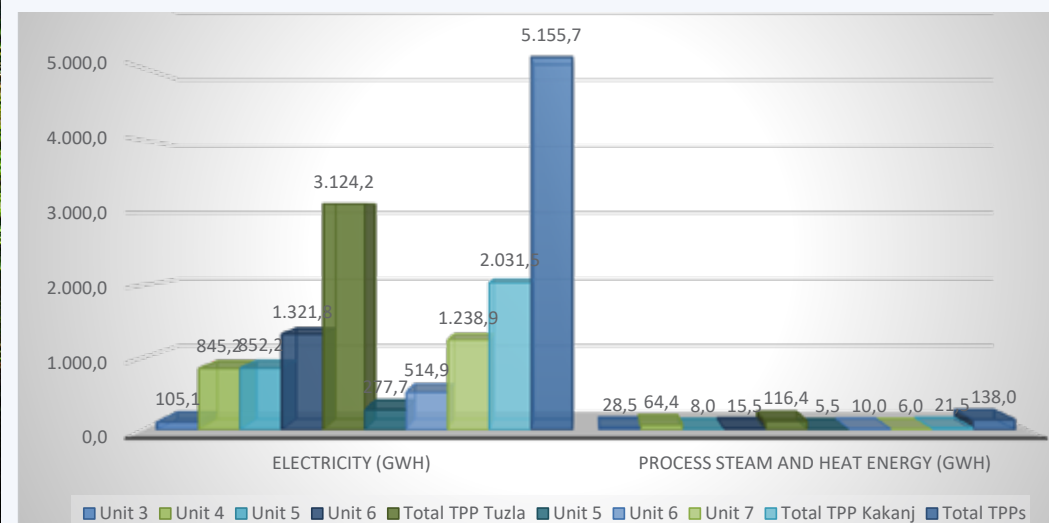


Diagram 2. Electricity, process steam and heat produced, by Units, in TPP Tuzla and TPP Kakanj (GWh)



A total of 5,325,867 t of coal were consumed in thermal power plants, of which 5,077,041 t for electricity production, 157,987 t for heat and process steam production, while 90,839 t refers to ullage and spillage. Out of the total quantities, 3,261,798 t (61.2%) were spent in TPP Tuzla, while the consumption in TPP Kakanj was realized in the amount of 2,064,069 t (38,8%).

The calorific value of coal consumed was a total of 12,122 (kJ/kg). The calorific value of coal used for the needs of operation of the TPP Tuzla was 12,033 (kJ/kg), and the calorific value of coal used in TPP Kakanj was 12,259 (kJ/kg).

The total specific heat consumption in thermal power plants was 11,917 (kJ/kWh), with the specific consumption in TPP Tuzla of 11,817 (kJ/kWh), while in TPP Kakanj it was 12,072 (kJ/kWh).

A total of 1,926.3 t of crude oil and 1,321.6 t of fuel oil was used for ignition and supporting fire in thermal power plants, in boilers.

In 2020, 7,537 million m³ of water were used in the Hydroelectric Power Plants on the river Neretva. Of this, it was used in:

- HPP Jablanica 2,281 million m³
- HPP Grabovica 2,570 million m³
- HPP Salakovac 2,686 million m³.

The total electricity production in HPPs on the river Neretva was 1024.1 GWh.

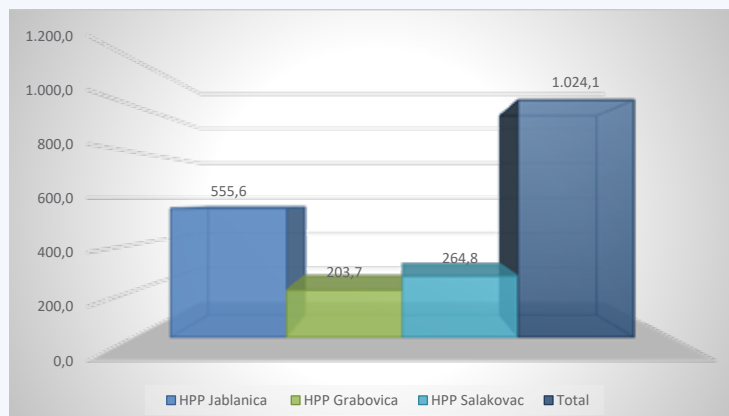


Diagram 3. Electricity produced in HPPs on the r. Neretva (GWh)

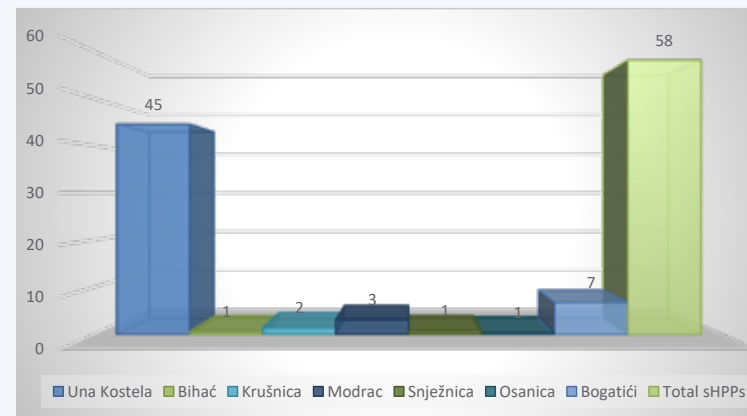


Diagram 4. Electricity produced in sHPPs (GWh)

BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

JP Elektroprivreda 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 2020, continued monitoring the air pollutant emissions from thermal power facilities – sulphur dioxide (SO₂), nitrogen oxides (NO_x), solid particles, and carbon dioxide (CO₂) emissions.

Total annual emissions of pollutants into air and CO₂ emissions from thermal power plants are given in Table 1.

Table 1 Emissions of pollutants into air and CO₂ emissions from TPP Tuzla and TPP Kakanj

Power plant	NO _x	SO ₂	solid particles	CO ₂
	t/yr.	t/yr.	t/yr.	t/yr.
TPP Tuzla	4.320	45.209	534	2.466.817
TPP Kakanj	7.757	75.769	47	2.340.920
Total	12.077	120.978	581	4.807.737

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 ³	m ³	
TPP Tuzla	9.939.427	745.228	11.423,7 ES
TPP Kakanj	10.756.318	5.924.684	25.394 ES

ED Tuzla

A tender has been announced for the procurement of the service for the construction of a new Central Warehouse for Hazardous and Non-Hazardous Waste, but the procurement procedure has been annulled and is planned to be repeated in 2021;

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 no. 5, Tuzla;

The restocking of the “Sniježnica” water reservoir was carried out;

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 audit service of the Main Design has been planned.

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 is paid.

Data on the total amount to be paid on the basis of bills for water consumption, wastewater drainage, water contributions and water protection fees according to the records of the Accounting Service (57,580.83 KM for Sarajevo Canton and Bosnia-Podrinje Canton of Goražde), and total water consumption 15,000 m³) according to the records of water consumption from individual accounts at seventeen (17) sites.

Measures to mitigate negative impacts on the environment

Revitalization of sHPP “Osanica 1” for improvements in terms of reducing possible negative impacts on the environment are provided by the Multi-Year Plan, depending on the situation, but we emphasize that at this time no negative consequences have been observed. Maintenance of plant equipment and devices is performed through:

- current maintenance; equipment inspection, revision (regular periodic inspections) and maintenance works (elimination of minor deficiencies observed during the inspection or revision),
 - investment maintenance; overhaul (repair and replacement of worn-out parts based on revision findings).
- Ongoing regular maintenance included the following activities:
- daily tour of the plant to identify deficiencies, daily maintenance of cleanliness and inspection of equipment (all activities are recorded in the Operational Log of sHPP “Osanica 1” and the Operational Log in the Dispatch Centre),
 - lubrication as needed (this activity is recorded in the Lubrication Book of the SHPP “Osanica 1”),
 - monthly inspection (on monthly inspections of devices and equipment of SHPP “Osanica 1” an Inspection Record is made and it is performed after thirty (30) days of operation, all in accordance with the Operation and Maintenance Instruction of SHPP “Osanica 1”),
 - annual inspection of all dam facilities (dam, water intake with associated equipment), the pipeline routes, was performed in December 2020 during the visit of the commission of the Ministry of Economy of the Bosnian-Podrinje Canton Goražde for water permit and no shortcomings or changes were found compared to the previous year.
- Investment maintenance included the following activities:
- considering that during 2017 the overhaul of the hydraulic equipment was performed as well as the overhaul of the unit 1, that is, in accordance with the Minutes on the Performed Periodic Inspections, Measurements and Tests on 02/12/2020, the protections of both generators were tested by experts from the Maintenance Sector- Electrical Service “Hydroelectric Power Plants on the river Neretva” Jablanica,

- On the same day, 02/12/2020, the Maintenance Sector- Technical Service of “Hydroelectric Power Plant on the river Neretva” Jablanica performed control and cleaning of both impellers of the generator,
- cleaning of river sediment at the water intake of SHPP “Osanica 1”.

Regular maintenance activities were performed by hiring workers from the Network and Plant Maintenance Sector (own work), while investment maintenance tasks were entrusted to third parties.

In 2020, there were no emergency situations at the “Bogatići” dam plant.

ED Zenica

In order to mitigate the negative impact on the environment and increase the safety of electric power facilities, during 2020, the service of regular maintenance of the building was performed (construction and craft works on the rehabilitation of transformer substations) in order to prevent a large-scale accident. Rehabilitation of transformer substations was carried out in accordance with technical recommendations that include environmental protection measures.

ED Bihać

Activities in accordance with regulations in the field of water protection

During 2020, a PEE report was regularly submitted regarding electricity production and water consumption. There is no wastewater.

The balance of cooling water taken from the Una River and treated through the filter system 800/50 mic., and used for cooling the bearing system of the unit, is estimated at about 570 thousand m³ for 2020.

Measures to mitigate negative impacts on the environment

From the aspect of reducing negative impacts on the environment, works were carried out on water intakes and revision of HPP “Una” Kostela, SHPP “Krušnica” Bosanska Krupa and SHPP “Bihać” Bihać.

The regular annual revision of HPP “Una” was performed in accordance with the documents: “Annual Revision plan of Equipment in Power Plants”, Branch “Elektro distribucija” Bihać, of 07/05/2020 and “Study on the Arrangement of the Work Site during the execution of Works on the Regular Annual Revision of the Equipment of HPP “Una” Kostela”, number: 03-2-3-21338/20 of 06/07/2020.

The revision of HPP “Una” Kostela was performed in accordance with the current practice, in the period of low hydrology from 03/08 - 04/09/2020, with the

following dynamics:

1. Unit no. 1 in the period from 12/08-19/08/2020.
2. Unit no. 2 in the period from 19/08- 27/08/2020.
3. Unit no. 3 in the period from 03/08-12/08/2020.
4. Unit no. 4 in the period from 27/08- 04/09/2020.
5. Total standstill of HPP “Una” Kostela on 26/08/2020.
6. Works on hydromechanical and other auxiliary equipment of the unit

The annual revision of the SHPP “Krušnica” Bosanska Krupa unit and construction facilities with HMO was performed in the period from 07/09-02/10/2020.

The annual revision of the SHPP “Bihać” Bihać unit and construction facilities with HMO was performed in the period from 19/10-30/10/2020.

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 2020, 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 2.103 t of non-hazardous waste was produced in the facilities of JP EP BiH. TPP Kakanj produced 1.369 t, TPP Tuzla 341 t, HPPs on r. Neretva 40,3 t. A total of 352 tonnes was produced in the power distribution subsidiaries (power distributions: Sarajevo, Tuzla, Zenica, Bihać and Mostar).

The total amount of hazardous waste, produced in JP EP BiH is 89,3 tons. TPP Kakanj produced 5,46 t, TPP Tuzla 10,88 t, HPPs on r. Neretva 23 t. A total of 50 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 1,470,867 t, of which 515,570 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 2020, the activities were continued that were started within the work of the Expert Team for continued monitoring and coordination of the necessary documentation for the construction of temporary waste storage in the electricity distribution branches of JP Elektroprivreda BiH, which was appointed by the

decision of the General Director in 2016. In February 2020, a contract was concluded for the reconstruction of the temporary waste storage facility at the site TS Azot 1, Vitkovići, Municipality of Goražde, number 06-EDSA/20 for a period of eighteen (18) months. In March 2020, the contract, number 18-EDSA/20, was concluded for the service of external supervision over the reconstruction of the temporary waste storage facility at the site TS Azot 1, Vitkovići, Municipality of Goražde for a period of eighteen (18) months. Works are in progress. Completion is expected in the first part of the current year.

At SHPP "Osanica 1", regular cleaning of the bed of the river Osanica and maintaining of water intake were performed.

The contract for the sale of secondary raw materials and waste materials collected in the Public Company Elektroprivreda Bosne i Hercegovine d.d.-Sarajevo, Subsidiary "Elektro distribucija", Sarajevo, was concluded with Trgosirovina d.o.o. Sarajevo in November 2019 for a period of eighteen (18) months. The contract for the sale of waste collected in the Public Company Elektroprivreda Bosne i Hercegovine d.d.-Sarajevo, Subsidiary "Elektro distribucija", Sarajevo, was concluded with the company Valbih d.o.o. Konjic, in December 2019 for a period of eighteen (18) months.

A framework agreement for the hazardous waste disposal service has been concluded with the company Kemis-BH d.o.o. Lukavac in October 2019 for a period of twenty-four (24) months. After the first individual contract concluded in December 2019, the second individual contract was concluded in July 2020, and in November 2020.

In June 2020, the Subsidiary handed over the discarded electrical and electronic equipment for processing and disposal to the operator of the waste electrical and electronic equipment management system, the Company ZEOS eko-sistem d.o.o. Sarajevo. The collector authorized by the system operator was Harex d.o.o. Sarajevo.

Since a small quantity of dismantled capacitors suspected of being filled with PCBs was subsequently found at the beginning of 2020, in June 2020, a dedicated PCB container was procured in which the found equipment will be temporarily stored in the Temporary Waste Storage Facility Azići. There are indications that the equipment in question can be disposed of in an environmentally sound manner through the UNDP project "Environmentally Friendly Management of Persistent Organic Pollutants (POPs) in the Industrial and Waste Management Sector in Bosnia and Herzegovina".

In 2020, the procurement of agents for environmental protection (absorbents) was realized.

At SHPP "Osanica 1" regular cleaning of the bed of the river Osanica and maintaining of water intake were performed. Approximately 50 kg of floating waste was collected and disposed of in an appropriate manner. Also, about 1,000 m³ of the alluvial deposit was collected and disposed of.

Waste Management in ED Tuzla

A tender was announced for the procurement of the service for the construction of a new Central Warehouse for Hazardous and Non-Hazardous Waste, but the procurement procedure was annulled and is planned to be repeated in 2021.

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

Waste management in ED Zenica

In 2020, 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 2020, the Main Design with revision was prepared for the construction of a temporary waste storage facility on the site of the former TS 35/kV in Drvarska bb, Bosanski Petrovac. Construction is planned for 2021.

The Subsidiary “Elektrodistribucija” Bihać continuously contracts the sale of secondary raw materials and waste materials, as well as hazardous waste disposal services, and in accordance with that, in 2020 the following activities were realized:

- In order to ensure the continuity of contracting the sale of secondary raw materials and waste materials, the procedure of selling secondary raw materials and waste materials generated in the Subsidiary “Elektrodistribucija” Bihać was initiated, and on the basis of the same the Contract number: 211-EDB/2020 of 14/09/2020 was concluded with Trgosirovina d.o.o. Sarajevo, noting that the previous Contract that was concluded with ISIA d.o.o. Cazin expired on 12/06/2020.
- The procurement procedure for hazardous waste disposal was carried out, which is an obligation defined by the provisions of the Law on Waste Management (Official Gazette of the Federation of BiH No. 33/03, 72/09 and 92/17), the Regulation on Selective Waste Collection, Packaging and Labelling (Official Gazette Of the Federation of BiH No. 38/06) and the Rulebook on Waste Categories with Lists (Official Gazette of the Federation of BiH No. 9/05), and based on the same, Contract No.: 351-EDB/2020 was concluded with KEMEKO-BH d.o.o. Lukavac.
- Also, the procedure of procurement of agents for environmental protection (absorbents) was carried out, with the aim of environmentally sound handling of mineral oils and readiness to react in case of incident situations, and based on the same, Contract No. 230-EDB/2020 of 11/09/2020 was concluded with CETEOR d.o.o. Sarajevo.

Restocking of HPPs on the river Neretva

HPPs on the river Neretva has planned for 2020 the procurement of fingerlings/fish is planned according to the “Annual Fishery Improvement Programs for 2020”, 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 restocking of 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 for 2020 was not performed.

According to the submitted Fishery Improvement Programs, allochthonous species of fingerlings/fish for restocking the fishing areas of Jablanica, Mostar and

Prozor-Rama were procured, with fingerlings/fish of carp, lake trout and rainbow trout for the Mostar fishing zone, while for other allochthonous species of fingerlings/fish of Arctic char and eel there were no bidders applied in the public procurement procedure. Also, for the needs of the Subsidiary “Hydroelectric Power Plant on the river Neretva” Jablanica, a contract was signed for the supply of fingerlings/fish of rainbow trout for restocking the fishing area of Prozor-Rama, which has not yet been implemented.

Power distribution subsidiaries

In **ED Tuzla** restocking of the hydro reservoir Snježnica 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**, in order to meet the obligations of the Agreement on the Improvement of Fish Stocks in the Una River Basin, the Agreement on the Improvement of Fish Stocks in the Krušnica River Basin, and the Annual Fishery Improvement Programs for 2020, restocking of Una and Krušnica rivers is regularly performed. The obligation under the Agreement on the Improvement of Fish Stocks in the Krušnica River Basin is a 60% participation in the annual restocking of the Krušnica river basin, 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.

The obligation under the Agreement on the Improvement of the Fish Stock in the Una River Basin from November 2019 is to finance the restocking of the Una River in the amount of 90,000 pieces of brown trout fingerlings of 10-15 cm age during the period of legal validity of the Fishery Basis of 5 (five) years (2019- 2023). In the previous period from the level of JP Elektroprivreda BiH d.o.o. Sarajevo, activities were conducted to establish uniformity in the procurement of fingerlings for restocking, which led to delays in fulfilling the legal obligation of the subsidiary, so that activities on the implementation of restocking of the Una and Krušnica river basins for 2020 are currently underway.

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 2020.

Use of transformer oil in Power Distribution Subsidiaries (EDs)

ED Sarajevo

In the normal course of the process of repair and maintenance of substations and transformers, in the Canton of Sarajevo and Bosnia-Podrinje Canton Goražde, in 2020, 4,528 kg of non-chlorated insulating oil and heat transfer oil based on mineral oil was spent (17.06% more oil in 2020 compared to 2019).

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-insulating transformer oil was supplemented, and 590 kg was consumed (approximately 8 % less oil in 2020 compared to 2019).

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 replacement 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.



TREND OF ENVIRONMENTAL IMPACT INDICATORS 2016 - 2020

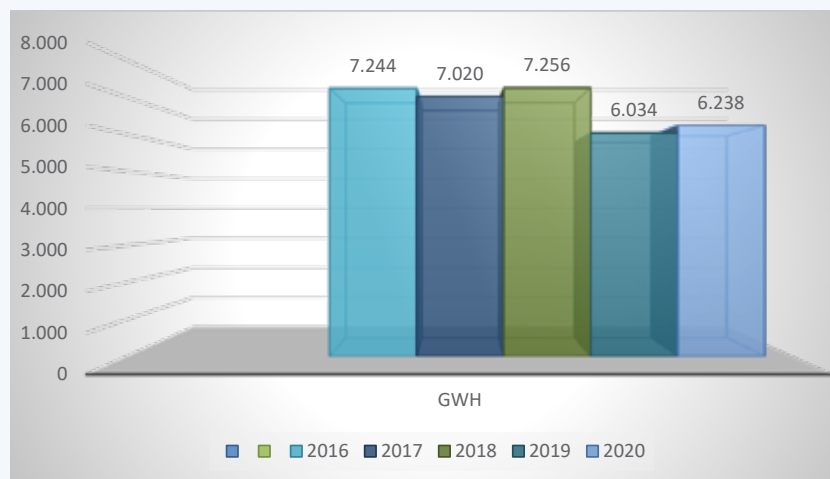


Diagram 5. Total electricity generation in the facilities of JP EP BiH for the period 2016 – 2020

TPP Tuzla and TPP Kakanj

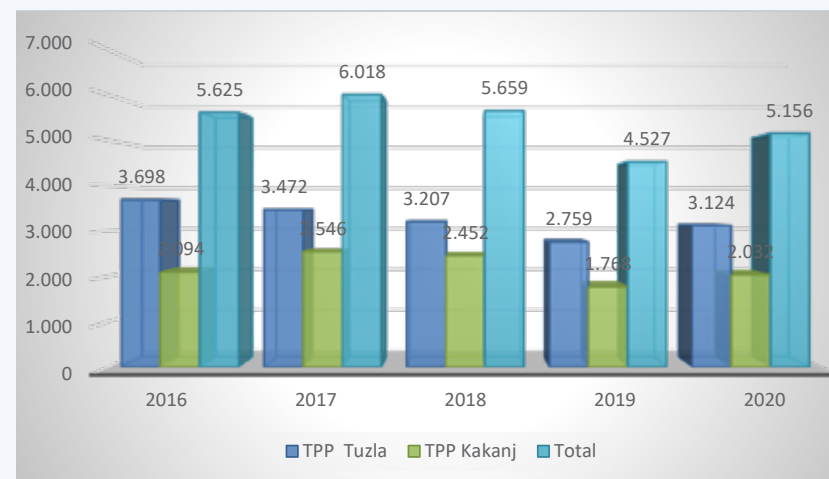


Diagram 6. Electricity generation in TPP Tuzla and TPP Kakanj for the period 2016 - 2020 (GWh)

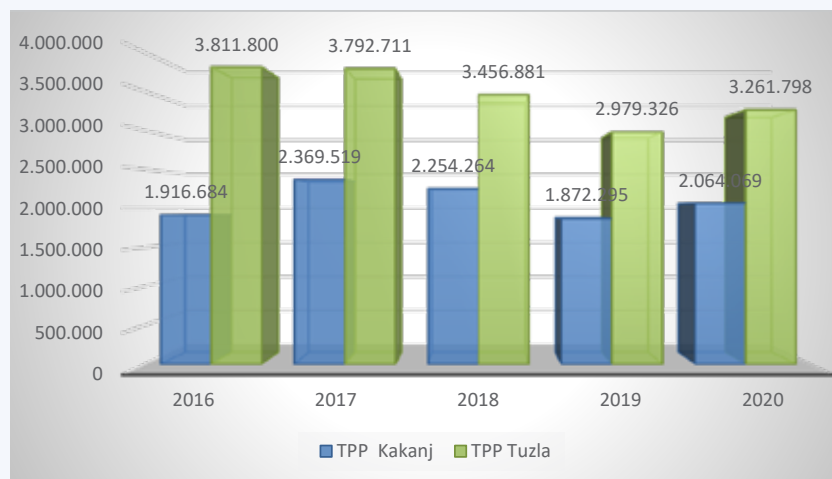


Diagram 7. Coal consumption in TPP Tuzla and TPP Kakanj for the period 2016 - 2020 (GWh)

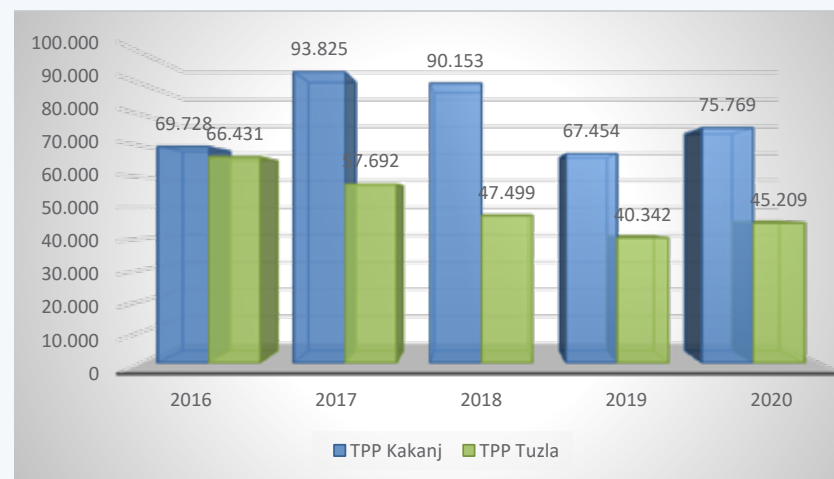


Diagram 8. Emission of SO2 from thermal power plants Kakanj and Tuzla for the period 2016 – 2020 (t)

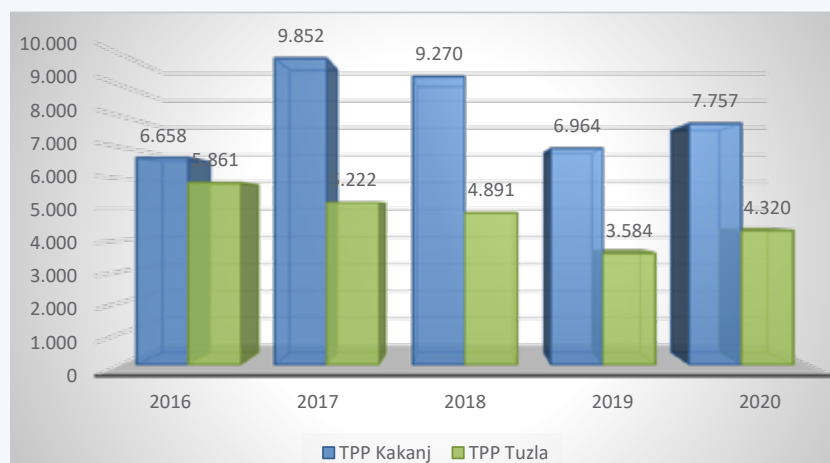


Diagram 9. Emission of NOx from TPP Tuzla and TPP Kakanj for the period 2016 – 2020 (t)

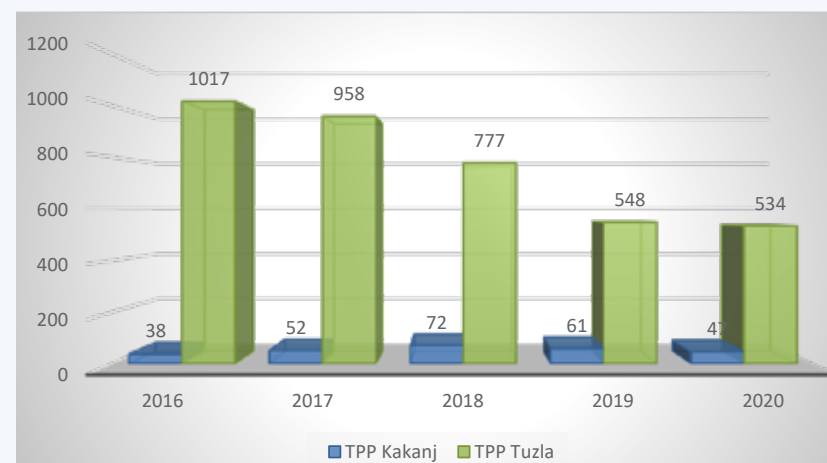


Diagram 10. Emission of solid particles from TPP Tuzla and TPP Kakanj for the period 2016 - 2020 (t)

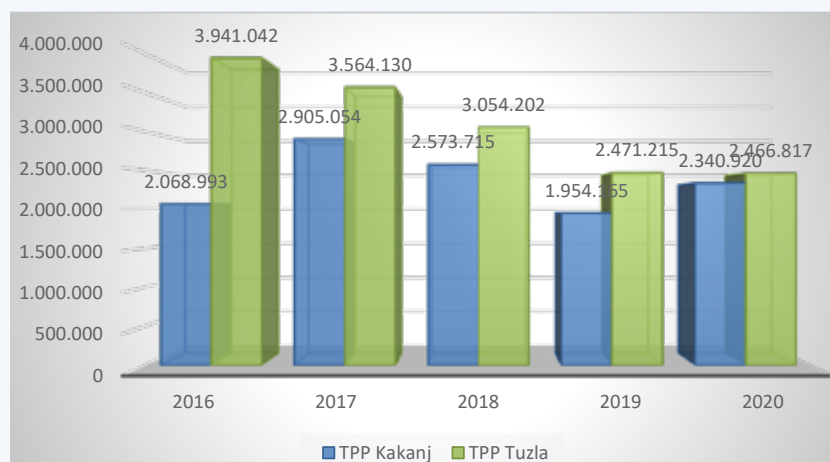


Diagram 11. Emission of CO₂ from thermal power plants Kakanj and Tuzla for the period 2016 – 2020 (t)

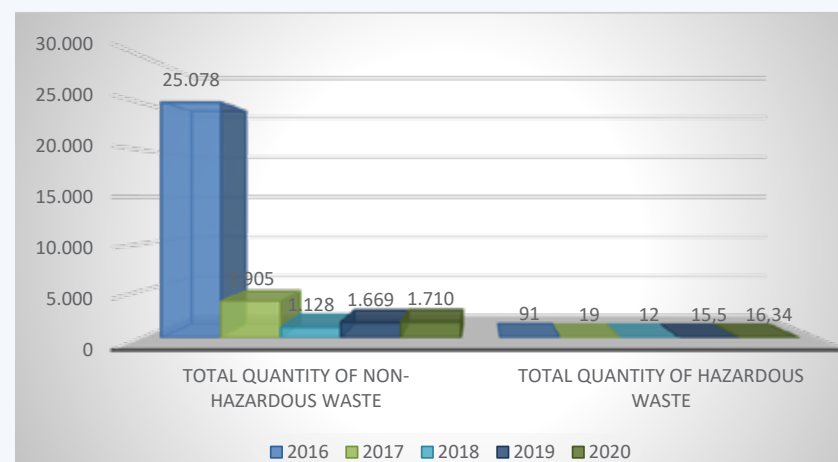


Diagram 12. Total quantity of non-hazardous waste and hazardous waste* in TPP Tuzla and TPP Kakanj for the period 2016 - 2020 (t)



Diagram 13. Total quantity of delivered slag and ash in TPP Tuzla and TPP Kakanj for the period 2016 - 2020 (t)

Hydro Power Plants on River Neretva

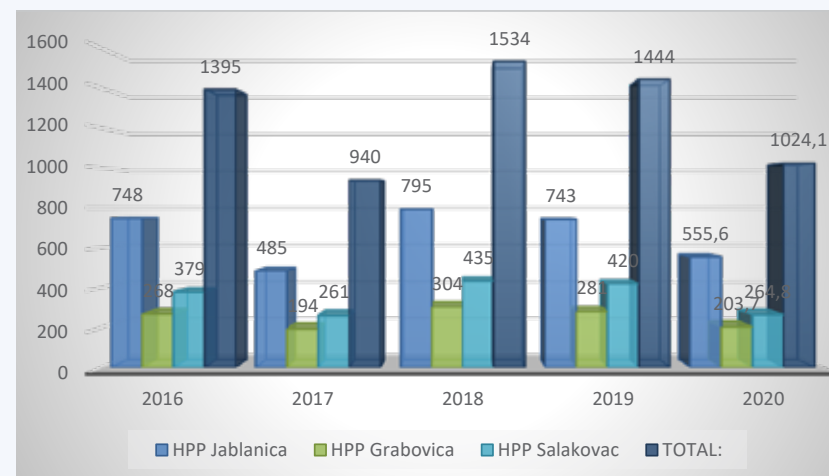


Diagram 14. Electricity generation in hydro power plants for the period 2016 – 2020 (t)

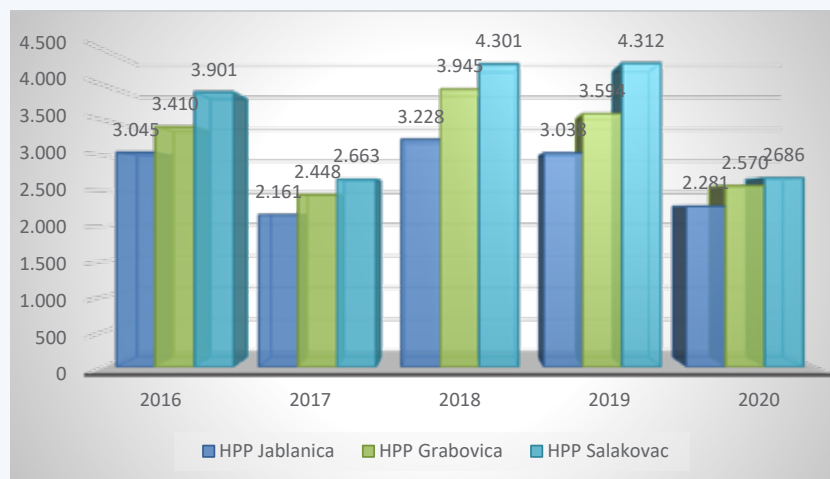


Diagram 15. Quantity of water used for electric power generation in hydropower plants for the period 2016 - 2020 (million m³)

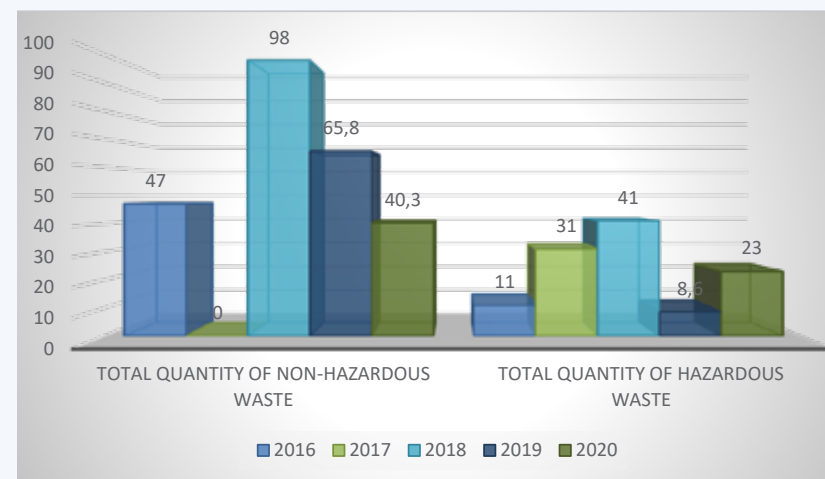


Diagram 16. Total quantity of non-hazardous waste and hazardous waste* in hydro power plants in the period 2016 - 2020 (t)

Power distribution subsidiaries

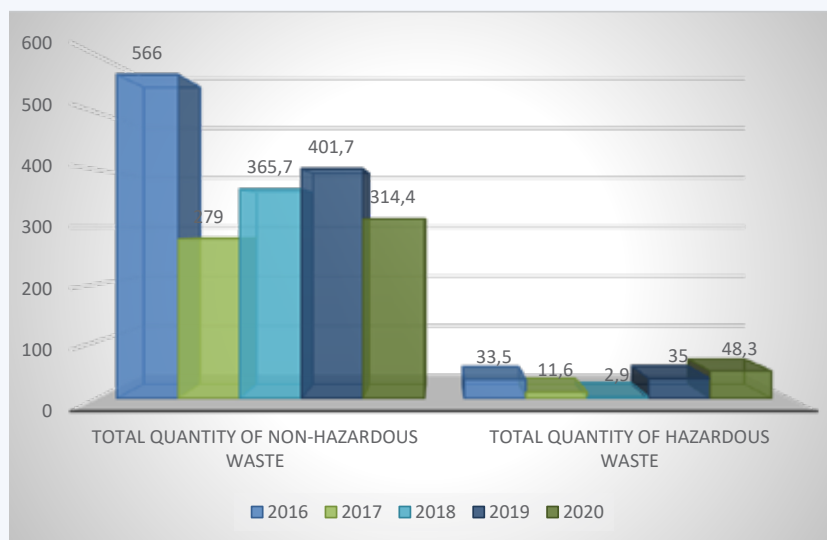


Diagram 17. Total quantity of non-hazardous waste and hazardous waste* in distribution subsidiaries: Sarajevo, Tuzla, Bihać, Zenica and Mostar, for the period 2016 - 2020 (t)

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

Federal Ministry of Environment and Tourism, on 30/06/2016, issued a renewed Environmental Permit for TPP number UP-I 05/2-23-11-151/15 SN, with a validity period of five years. NGO Ekotim Sarajevo, initiated an administrative dispute against the decision on the said Environmental Permit due to the name “renewed environmental permit”.

The Cantonal Court in Sarajevo on 28/09/2020 rejected the lawsuit of the NGO Ekotim Sarajevo. The activities and measures for minimizing air emissions into environment, which are prescribed by the Environmental Permit, are regularly carried out. TPP “Tuzla” reports to the Federal Ministry of Environment and Tourism according to the Rulebook on Monitoring the Emissions of Pollutants into the Air (Official Gazette of FBiH 09/14), prepares and submits the Waste Management Plan; fills in PRTR forms, informs the Ministry and the public about unplanned changes in the technological process (increase in air emissions, extraordinary releases into the recipient, increase in noise, etc.). Continuous monitoring of air pollutants is in line with the applicable standard. Obligations to monitor emissions to air, water and soil are continuously implemented. In December 2020, TPP “Tuzla” started activities for the preparation of the Request for extension/renewal of the environmental permit.

TPP Kakanj

- An Environmental Permit has been obtained for the construction of a flue gas desulphurisation and denitrification plant.
- Filling of slag and ash on the sixth level of the western slope and recultivation were carried out- Phase I
- The Phase I and II of rehabilitation of the Slapnički potok collector has been completed
- According to the conducted noise measurements, the level of noise emission from the bridge for external coal supply was reduced
- Standard storage methods are applied in TPP “Kakanj”
- Reconstructed part of the hot water pipeline for district heating of Kakanj
- The activity was carried out through the implementation of the requirements of the Standard BAS EN ISO 14001: 2017: Environmental Management Systems
- Overhauls of the devices are carried out according to the plan of overhauls, maintenance of plants and facilities
- Preventive maintenance of the entire plumbing installation is performed

- The quality control of incoming energy sources is performed regularly
- Activities related to measuring and monitoring the consumption of water, coal, chemicals, fuel oil for ignition, own electricity consumption are regularly carried out.
- The consumption of raw materials and energy is regularly balanced by units and kWh produced. Balances are analysed.
- Energy and water consumption meters are regularly maintained and serviced
- Own electricity consumption and heat consumption are regularly monitored
- District heating water heaters are regularly maintained
- Installed devices for measuring heat supply
- As part of the management of the technological process of water use, a system for continuous monitoring of quantitative-qualitative characteristics of technological wastewater has been established, before its discharge into the river.
- The thickener sludge treatment tank is cleaned regularly, and the overflow water is returned to the treatment so that the water does not go into the river Bosna
- The possibility of placing slag and ash in industry and/or construction was examined.
- Waste material that has a utility value is used
- Empty packaging is handed over to the operator for reuse
- Waste is stored in a timely manner and permanently disposed of by the operator
- The generated inert waste is disposed of in a slag and ash landfill
- Regular care is taken to replace hazardous substances with less hazardous ones
- The separation of the mentioned types of waste is performed
- Hazardous waste is handed over to an authorized operator
- Preventive measures for the occurrence of pollution are being implemented
- Waste flow monitoring has been established
- Within the projected values, activities are carried out regularly
- Radioactivity control is carried out regularly
- Within the existing possibilities, wetting of the landfill is done regularly
- Waste disposal activities at the landfill are continuously monitored
- The rollers are lubricated regularly
- The worn-out parts of the conveyor were replaced as needed
- The results of the measurement of noise emission levels do not indicate the need to build sound barriers
- Water intake facility, system for collection, treatment and discharge of wastewater is maintained in functional condition
- Construction of peripheral canals and gutters for receiving rainwater around the landfill and rainwater from the landfill, in accordance with the dynamics of landfill expansion
- Safe storage and handling of hazardous substances and waste generated at the thermal power plant site
- Sludge from TOV plants and facilities is not deposited on the banks of watercourses
- Provided handy means for quick intervention in case of uncontrolled release of dangerous substances

Hydro Power Plants on River Neretva

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. The Ministry of Economy of the Bosnian-Podrinje Canton Goražde on 28/12/2020 issued a new decision on water permit, number UP-1:04-21-733/20, with a validity period of two (2) years with the obligation to submit the Study on Ecologically Acceptable Water Flow (EPP) on the river Osanica until 31/12/2021. Subsidiary “Elektro distribucija” Sarajevo, for this purpose, entered into a contract with Institut za hidrotehniku d.d. (Institute of Hydraulic Engineering) Sarajevo for the preparation of the Study on Ecologically Acceptable Water Flow (EPP) and by comparing the water flow with a watercourse of similar characteristics in the immediate environment. The completion time is fifteen (15) months.

During 2020, due to the COVID-19 epidemic, the Cantonal Administration for Inspection Affairs did not inspect the production facility of SHPP “Osanica 1”, but the Subsidiary “Elektro distribucija”, Sarajevo Business Unit of Distribution Goražde, submitted “on request” evidence of payment of water fee.

The conditions from the water permit for the Temporary Waste Storage Facility Azići are respected.

The activities started at the end of 2019 on the development of the terms of reference for the development of the main design for the arrangement of the open warehouse and the Azići circle and the preparation of the necessary tender documentation for the procurement of the Main Design, and the collection of related documentation continued in 2020. The Terms of Reference for the preparation of the Preliminary Design with a 3D presentation and the Main Design of the open warehouse of the Subsidiary “Elektro distribucija”, Sarajevo with accompanying facilities in Azići were done. The necessary documentation was obtained (cadastre of utility devices, copy of the cadastral plan, change of possessor, etc.) and tender documentation was prepared for initiating the procedure of procurement of the design service. In the middle of 2020, the procedure was initiated, no bids were submitted.

ED Tuzla

The following energy facilities belong to the subsidiary “Elektrodistribucija” Tuzla: MHE “Modrac” in Lukavac and MHE “Sniježnica” with hydro reservoir in Teočak. For all facilities, the Subsidiary has valid environmental and water permits. The new environmental permit for SHPP “Sniježnica” was issued on 16/01/2020. Environmental and water permits have been issued under special conditions and measures to be taken for the gradual reduction of negative impacts on the environment, and the following is carried out accordingly:

- Regular observation of dams and reservoir, control of working parameters, visual control of erosive processes, etc.;
- Technical, geodetic and physical observation of the dam;
- Selective separation of waste and keeping records of produced waste quantities;
- Restocking of hydro reservoir “Sniježnica”, 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 “Sniježnica” 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 supply and installation of the septic tank was not conducted in 2020, and will be repeated in the next year.

The development of the Preliminary and Main Design of landslide rehabilitation on the right side of the Sniježnica Dam has been completed, but activities for the procurement of the external design revision service have not yet been initiated.

The Ministry 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

The Ministry of Agriculture, Water Management and Forestry of Una-Sana Canton issued a Water Permit for the Una Kostela HPP facility on 24/06/2020, with a validity period of ten (10) years.

Environmental and water permits are issued under special conditions and measures that are continuously monitored.

- the captured amount of water for the needs of small hydropower plants is performed through an automated hydrological monitoring system, and is registered on the hydrological measuring profile, at the entrance to the supply channel, surge tank and diffuser outlet
- HMO manipulations are performed in the manner described in the “Plan of Operation and Maintenance” in accordance with the provisions of the rulebook on the minimum content of the general act on maintenance, use and monitoring of water facilities.
- technical monitoring of the facility and the surrounding terrain of HPP “Una” is performed, and the observations are interpreted in accordance with the applicable regulations, and appropriate and necessary measures of maintenance, rehabilitation and intervention are planned and implemented.
- operational documentation is kept on all manipulations and phenomena that occur on the facility.
- in the period of high waters, the time of operation of overflow bodies is monitored, as well as the amount of alluvium on the intake structure.
- sampling of technological and waste water from the unit in HPP “Una” Kostela and from drainage wells 1 and 2, as well as sampling of water from the river Una downstream and upstream from the facility HPP “Una” Kostela are performed by a certified institution.

ENVIRONMENTAL MANAGEMENT SYSTEM

TPP Tuzla

IMS internal audits in 2020 were conducted in February and March 2020, and showed a smaller need for corrective actions and improvements in individual processes.

The ICS d.o.o. Sarajevo, on 07/10/2020 and 08/10/2020, conducted the control audit of the Integrated Quality and Environment Business Management System in TPP “Tuzla”, according to the requirements of ISO 9001:2015 and ISO 14001:2015.

All activities in the Sector for Management Systems were carried out with the application of preventive measures to prevent the spread of coronavirus (COVID-19).

TPP Kakanj

TPP Kakanj has been certified according to the requirements of the BAS EN ISO 14001:2017 Standard.

The harmonization of the Environmental Management System with the requirements of the said standard implied the introduction of the following principles:

- That the 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.

Hydro Power Plants on River Neretva

The Program to improve the Integrated Management System (IMS) for 2020 was developed, on the basis of which the following activities were carried out:

- A review of ISU documents (Management review) was performed by the management, in December 2020;
- An Internal Audit was conducted in all plants/sectors in the period from October to December 2020;
- An analysis of environmental aspects, that relate to the process of power generation in facilities/sectors was carried out in August 2020;
- Assessment of compliance of work with legal and other environmental requirements was carried out in November and December 2020;
- The Quality Objectives and Environmental Objectives for 2020 were prepared in April 2020;
- The Report on the Recertification Audit of the Integrated Management System (ISU) in the HPP Branch on the river Neretva, which was held from 15/12/2020 to 17/12/2020 was prepared by ICS- Institute for System Certification according to the requirements of ISO 9001:2015 and ISO 14001:2015.

ED Tuzla

The Recertification Audit of Environmental Management System BAS EN ISO 14001 was completed in July 2020, 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 measures.

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.

ED Sarajevo

Quality Management System Certificate, obtained in accordance with the requirements of the ISO 9001:2015 standard, from Institut za certificiranje sistema d.o.o. (Institute for System Certification Ltd.) Sarajevo is valid until 09/07/2022. In 2020, the first supervisory audit was conducted. In the field of environmental management, the Subsidiary is continuously working to improve the relationship with the environment, through a systematic approach to waste management and implementation of regulations. The goal is to build an integrated management system.

Due to the entry into force of the Rulebook on Construction Waste in 2020, a new edition of the quality system document PSA 85/07 Waste Management was issued, where the appendix to the procedure is the Construction Waste Management Plan adapted to the said Rulebook.

In September 2020, a new edition of the Environmental Policy of the Subsidiary was issued.



ENVIRONMENTAL PROTECTION WITHIN THE DEVELOPMENT OF ELECTRIC POWER FACILITIES

TPP Tuzla

Preparatory activities for reclamation of Divkovići and Plane combustion products landfills

The landfill for combustion products “Plane” and “Divkovići” has not been used for disposal since mid-2015 and is in the phase of preparatory works for closure and reclamation.

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 signed a contract with 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, the FMOET requested additional documentation on 11/10/2019. The documentation was supplemented by the company Enova d.o.o., and it was submitted to FMOET on 11/12/2019. On 22/01/2020, 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 “Tuzla” submitted a statement on the mentioned Conclusion on termination of the procedure and submitted a new version of the environmental documentation, i.e., the Study with accompanying documents.

Preliminary activities for the construction of a desulphurization plant in TPP “Tuzla”

TPP “Tuzla” has initiated all necessary activities to obtain a permit for desulphurization of Units 5 and 6. TPP “Tuzla” submitted to the Federal Ministry of Environment and Tourism (FMOIT) the Environmental Impact Study and on 29/09/2016 a public consultation was held. The Expert Commission positively assessed the Study prepared by the Consortium Energoinvest d.d. Sarajevo and Steag Energy Services GmbH Germany, but the NGOs considered the Study unsatisfactory, so the Federal Ministry suspended the procedure, and the City Council at its 27th regular session (item 15) adopted a conclusion that TPP “Tuzla” should prepare a NEW Study. The new Study was prepared by the consulting company Enova d.o.o. Sarajevo. In the renewed procedure, Enova updated the Environmental Impact Study and the Waste Management Plan. After submitting the updated documents (Study and Waste Management Plan), FMOET terminated the administrative procedure by Conclusion No. UPI 05/2-23-11-178/19 SN due to the fact that TPP “Tuzla” did not withdraw the lawsuit against FMOET and the administrative dispute was not terminated before the Cantonal Court in Sarajevo.

As there was no understanding by FMOET and as TPP Tuzla did not receive an environmental permit for desulphurization of units 5 and 6 by wet process, JP Elektroprivreda BiH at the meeting of the Supervisory Board held on 31/05/2018, passed the Decision on investment in the project Construction with a semi- dry

process for flue gas desulphurization plant in Unit 6.

JP EP BiH d.d. Sarajevo concluded a contract with the Consultant for preliminary activities for the construction of flue gas desulphurization plant in Unit 6 (Contract Number 058-TET-20). The Consortium was selected as a consultant for the flue gas desulphurization project in Unit 6: ILF Consulting Engineers Polska sp. Z.o.o., Poland, EMG Consult EOOD, Bulgaria, ENOVA d.o.o. Sarajevo, Sarajinženjering d.o.o. Sarajevo, represented by ILF Consulting Engineers Polska sp. Z.o.o., Poland. A preliminary environmental impact assessment has been completed and submitted to the competent Ministry. FMoET issued a Conclusion on the preparation of an Environmental Impact Assessment Study for the flue gas desulphurization in Unit 6 (Number: UPI 05/2-02-19-5-92/20 of 22/09/2020). The preparation of investment and technical documentation, i.e., the preparation of the Preliminary Design, is in progress.

TPP Kakanj

Environmental protection within TEK is primarily implemented by the implementation of requirements from existing approvals for the operation of TEK facilities, i.e., the implementation of obligations from the environmental and water permits.

Environmental protection is implemented by:

- Implementation of air emission reduction projects (Preliminary activities are underway regarding the construction of flue gas desulphurization plant for Unit 7),
- Implementation of the Project for arranging the slag and ash landfill
- Realization of activities ordered by the water permit.

ED Sarajevo

In 2020, eighteen (18) new transformer stations were built and put into operation. Of these, sixteen (16) are cable-freestanding, and two (2) are pole-mounted transformer stations. All new power facilities are designed with hermetically sealed oil transformers. Under each transformer in cable transformer stations, the foundations are designed in such a way as to enable the collection of the entire amount of oil of the power transformer (oil sump with a minimum volume of 0.6 m³, oil impermeable) so that the technical performance meets environmental standards.

Based on investment decisions, in 2020, 4,141 low-voltage connections, 10(20) kV medium-voltage lines in the length of 83.42 km and 0.4 (kV) low-voltage lines in the length of 100.28 km were built. 10(20) kV medium voltage lines in the length of 3.79 km, 0.4 kV low voltage lines in the length of 33,136 km and 24,146 billing metering points (OMM) were reconstructed.

ED Zenica

In 2020, eighteen (18) new transformer stations were built and put into operation. All new power facilities are designed with hermetically sealed oil transformers. Under each transformer in cable transformer stations, the foundations are designed in such a way as to enable the collection of the entire amount of oil of the power transformer (oil sump with a minimum volume of 0.6 m³, oil impermeable) so that the technical performance meets environmental standards.

Based on investment decisions, in 2020, 2,382 low-voltage connections, medium-voltage lines in the length of 28,226 km and low-voltage lines in the length of 165,283 km were built.

One (1) 10(20)/0.4 kV transformer station, 0.67 km medium voltage lines, 11.9 km of low voltage lines and 24,236 pieces of billing metering points (OMM) were reconstructed.

ED Bihać

Within the electricity distribution activity, new electric power facilities were built, and the existing electric power facilities were reconstructed.

When it comes to measures taken to protect the environment, all activities when it comes to investments or regular maintenance of EEE use homologated materials that are installed in accordance with the Technical Recommendations of JP Elektroprivreda BiH d.d. Sarajevo, so that the entire environment (facilities and population) is protected from our facilities and plants to the extent required by technical instructions, norms and procedures.

In 2020, there were no constructions and installations of electric power plants and facilities for which it is necessary to obtain an environmental permit in accordance with the Federal Regulation on plants and facilities that are subject to the obligation to obtain an environmental permit.

When demolishing, removing and rehabilitating existing buildings in accordance with the Rulebook of JP Elektroprivreda BiH d.d. - Sarajevo on environmental protection, construction waste, especially if it contains hazardous substances (asbestos, etc.) was properly disposed of. Mixed waste from the site generated during construction and assembly was also removed, and temporary disposal of secondary raw materials was performed.

ED Mostar

All new power facilities (10(20)/0.4 kV transformer stations) built in 2020, were designed with hermetically sealed oil transformers, and under each transformer in cable transformer stations the foundations were designed in a way to enable the collection of the entire amount of power transformer oil (oil trough of volume of minimum 0.6 m³, oil impermeable) in order for the technical performance to meet the environmental protection standards.

Care was taken that the pole-mounted transformer stations were not located in the water protection zone.

CAPITAL INVESTMENTS

Hydro Power Plant Janjići and Hydro Power Plant Kovanići

Continuous monitoring of groundwater levels on installed piezometers was continued.

Unit 8 TPP Kakanj

Innovation of investment- technical and environmental documentation of replacement Unit 8 in TPP Kakanj.

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

Preparation of Investment and technical documentation “Preliminary Design of Thermal Energy Supply from TPP Kakanj to/including Sarajevo”.

PREPARATION OF PLANNING AND STUDY DOCUMENTS

In the segment of study and planning documents in 2020, 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 CO₂ 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, inter alia, 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, electric cars, 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:

- Podveležje Photovoltaic Power Plant Project
Techno-economic analysis of the construction of the Podveležje photovoltaic power plant- the Study was prepared and application filed for a grant for the preparation of further development and investment documentation in cooperation with KfW, including the assessment of the impact of PVPP on the environment. The grant has been approved and the funds are not yet available. Initiation of further implementation is pending.
- Electricity distribution system development plan until 2030.
- The Study “Analysis of Possibilities for the Construction of Photovoltaic Power Plants on the Free Surfaces of the EPBiH Concern’s Coal Mines and on the Slag and Ash Landfills of TPP EPBiH”.
- Justification Study for the Construction of Photovoltaic Power Plants on the Free Surfaces of the EPBiH Concern’s Coal Mines and on the Slag and Ash Landfills of TPP EPBiH – FNE Gračanica.
- Justification Study for the Construction of Photovoltaic Power Plants on the Free Surfaces of the EPBiH Concern’s Coal Mines and on the Slag and Ash Landfills of TPP EPBiH – FNE Kreka.
- Justification Study for the Construction of Photovoltaic Power Plants on the Free Surfaces of the EPBiH Concern’s Coal Mines and on the Slag and Ash Landfills of TPP EPBiH – FNE Divkovići.
- Possibilities of energy crop/biomass plantations on the land of the of the EPBiH Concern mines (pre-feasibility study).
- Analysis of tax schemes for CO₂ emissions with the proposal of the optimal sustainable scenario for EPBiH.

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 **37.974,723** 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 3, 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 3 Environmental Protection Costs in the Domain of Environmental Management

Organization	(KM)
Subsidiaries	
TPP Tuzla	Investments fees and services= 999.671
TPP Kakanj	2.247.116
HPPs on the Neretva River	1.224.083
ED Sarajevo	407.501
ED Tuzla	699.252
ED Zenica	875.799
ED Bihać	446.021
ED Mostar	177.143
Fee for air pollution of TPP Tuzla	1.964.320
Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP	4.704.817
Fee for water protection	33.472
Fee for air pollution of TPP Kakanj	2.820.842
Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP	3.459.520
Fee for water protection	322.689
Contributions for hydro reservoir (HPP on river Neretva)	15.993.522
Fee for water protection HPP on river Neretva	5.404
Company Directorate	
Sector for strategic development	519.901
Capital investments	1.023.490
Water charges and communal utilities	50.160
TOTAL:	37.974.723