

Annual Report of Environmental Protection for 2016.

Public Enterprise Elektroprivreda of Bosnia and Herzegovina

AREP

ANNUAL REPORT OF ENVIRONMENTAL PROTECTION

2016

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Annual Report of Environmental Protection

2016. contents

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01 POWER AND THERMAL ENERGY GENERATION



In 2016, JP Elektroprivreda BiH in its production facilities has achieved the total electricity generation in the amount of 7,244 GWh, of which thermal power plants produced 5,780 GWh (TPP Tuzla 3,686 GWh and TPP Kakanj 2,094 GWh), and hydro power plants 1,464 GWh (HPP on Neretva 1,395 GWh and sHPPs 69 GWh) (Diagram 1).

Diagram 1. Production of electricity and thermal energy in 2016

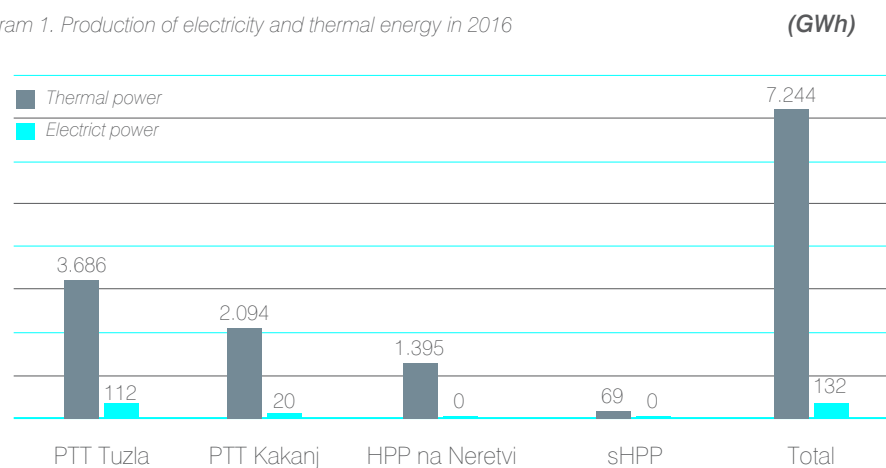
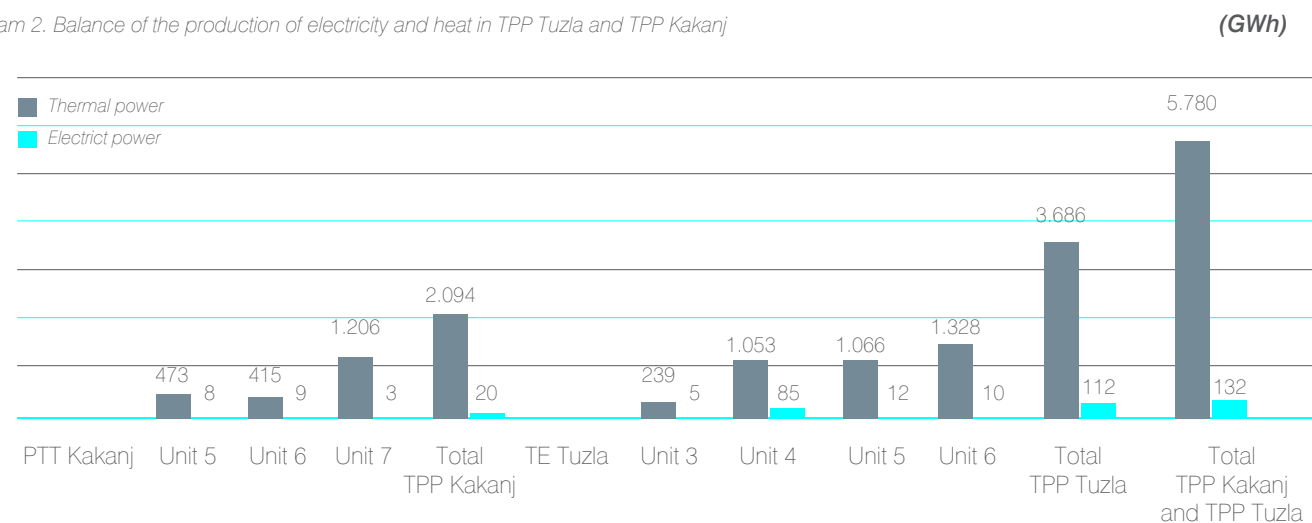
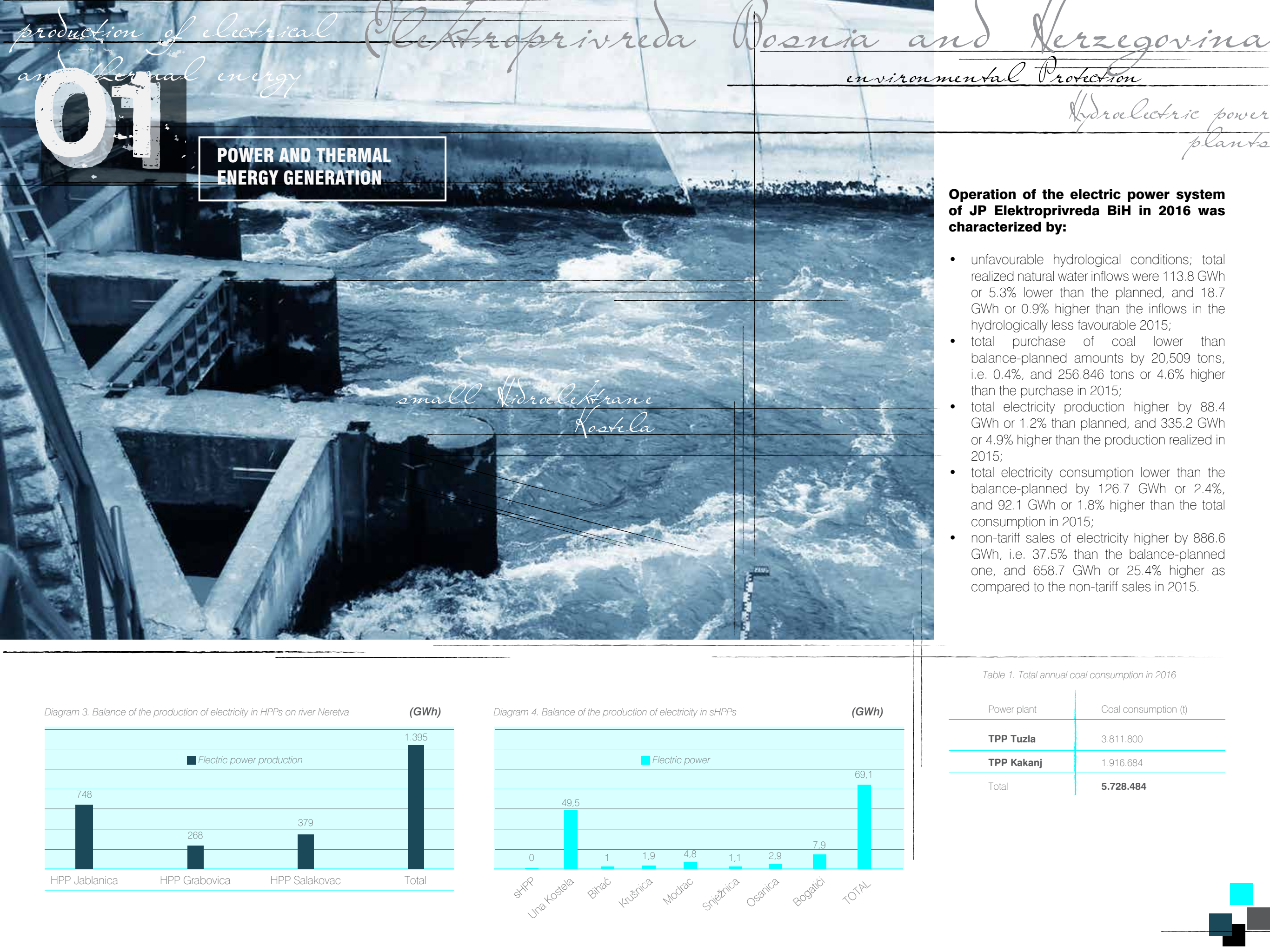


Diagram 2. Balance of the production of electricity and heat in TPP Tuzla and TPP Kakanj





production of electrical and thermal energy

01

POWER AND THERMAL ENERGY GENERATION

Elektroprivreda Bosna and Hercegovina

environmental Protection

Hydroelectric power plants

small Hidroelektrane Kostela

Operation of the electric power system of JP Elektroprivreda BiH in 2016 was characterized by:

- unfavourable hydrological conditions; total realized natural water inflows were 113.8 GWh or 5.3% lower than the planned, and 18.7 GWh or 0.9% higher than the inflows in the hydrologically less favourable 2015;
- total purchase of coal lower than balance-planned amounts by 20,509 tons, i.e. 0.4%, and 256.846 tons or 4.6% higher than the purchase in 2015;
- total electricity production higher by 88.4 GWh or 1.2% than planned, and 335.2 GWh or 4.9% higher than the production realized in 2015;
- total electricity consumption lower than the balance-planned by 126.7 GWh or 2.4%, and 92.1 GWh or 1.8% higher than the total consumption in 2015;
- non-tariff sales of electricity higher by 886.6 GWh, i.e. 37.5% than the balance-planned one, and 658.7 GWh or 25.4% higher as compared to the non-tariff sales in 2015.

Diagram 3. Balance of the production of electricity in HPPs on river Neretva (GWh)

HPP	Electric power production (GWh)
HPP Jablanica	748
HPP Grabovica	268
HPP Salakovac	379
Total	1.395

Diagram 4. Balance of the production of electricity in sHPPs (GWh)

sHPP	Electric power (GWh)
Una Kostela	49,5
Bihac	1
Krusnica	1,9
Modrac	4,8
Snjeznica	1,1
Osanica	2,9
Bogatci	7,9
TOTAL	69,1

Table 1. Total annual coal consumption in 2016

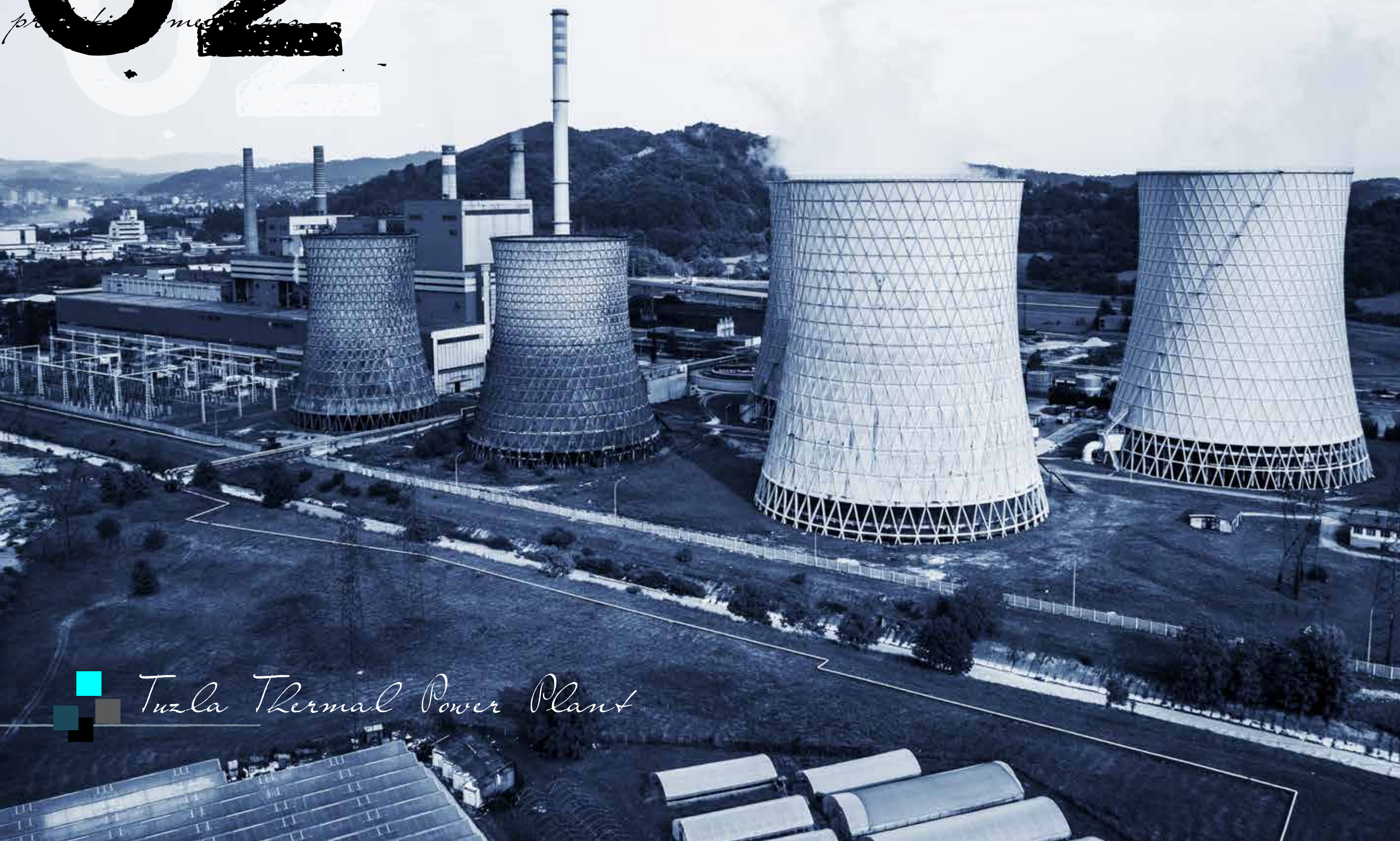
Power plant	Coal consumption (t)
TPP Tuzla	3.811.800
TPP Kakanj	1.916.684
Total	5.728.484

basic indicators of environmental

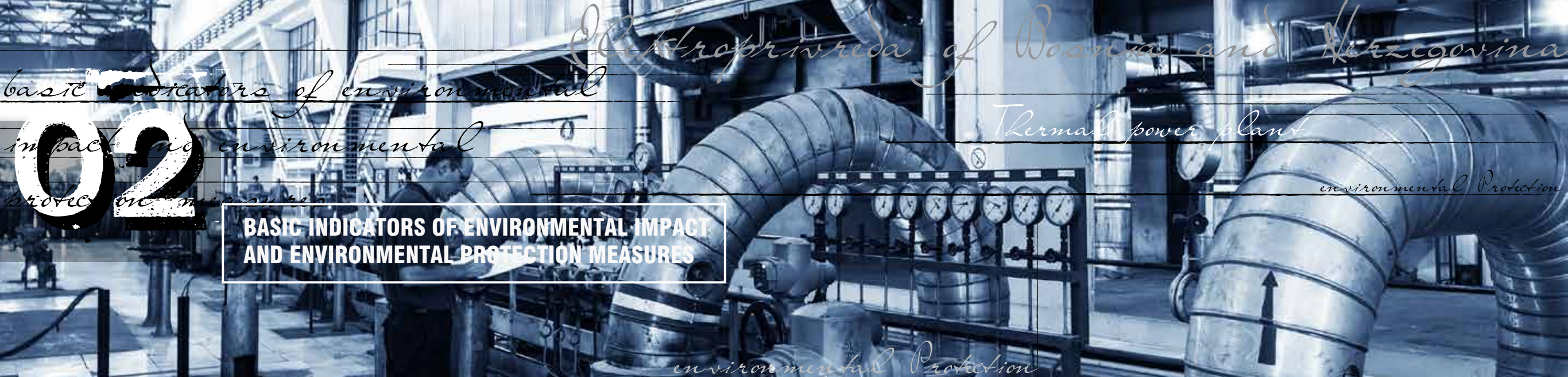
02

BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

Elektroprivreda of Bosnia and Herzegovina



Tuzla Thermal Power Plant



basic indicators of environmental
impact and environmental
protection measures

Elektroprivreda of Bosnia and Herzegovina

Thermal power plant

environmental Protection

environmental Protection

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.

THERMAL POWER PLANTS

Air pollutants emissions

In accordance with the legislation in the field of air protection, JP Elektroprivreda BiH, during 2016, 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 2.

Table 2. Emissions of pollutants into air and CO₂ emissions from TPP Tuzla and TPP Kakanj

Power plant	NO _x t/yr	SO ₂ t/yr	solid particles t/yr	CO ₂ t/yr
TPP Tuzla	5.861	66.431	1.017	3.941.042
TPP Kakanj	6.668	69.728	38	2.068.993
Total	12.529	136.159	1.055	6.010.035

Water use and emissions into water

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 (EBS) are given in Table 3.

Table 3. Balance of water used and discharged for generation of electricity, thermal power and process steam in TPP Tuzla and TPP Kakanj and EBS

Power plant	Used water m ³	Discharged water m ³	Population equivalent (EBS)
TPP Tuzla	9.876.140	2.056.179	319.273
TPP Kakanj	10.262.516	5.798.939	23.332

Technical chemicals were used for the preparation of process water and for the wastewater treatment in thermal power facilities. The balance of consumption of technical chemicals is given in Table 4.

Table 4. Balance of technical chemicals used in wastewater treatment process

Thermal power plant	Name	Quantity (t)
TPP Kakanj	Hydrated lime	856,60
	Hydrochloric acid	295,90
	Sodium hydroxide	108,00
	Nalco 71221	61,00
	Nalco N -7359	26,80
	Sodium hypochlorite	22,70
	Nalco N- 3DT 149	19,00
	Ferric sulphate	39,00
	Levoxine (hydrazine)	7,20
	Nalco N 3DT 199	2,45
	Nalco 71605	3,44
	Nalco 3434	2,20
	Nalco 7348	1,15
	Ammonium hydroxide	1,30
	Trisodium phosphate	1,90
TPP Tuzla	Nalco N- 1700	0,45
	Nalco N- 72310	0,40
	Hydrated lime	1.664,20
	Hydrochloric acid	577,16
	Soda lye (100%)	335,17
	Iron (III) sulphate	192,02
	NALCO N- 72.310	0,36
	Sodium chloride	74,55
	Sodium hypochlorite	9,20
	Levoxine 15	11,40
	Trisodium phosphate	2,55
	NALCO N – 3DT 149	23,88
	NALCO N – 3 DT 199	2,63
	NALCO N – 7359	25,00
	NALCO N – 3434	0,56
	NALCO pHREE 5200	37,15
	NALCO 1700	0,20
	Potassium lye	0,05



BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

RADIOACTIVITY MONITORING

TPP Tuzla

In accordance with the "Rulebook on maximum limits of radioactivity and 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.

In 2016, the Veterinary Faculty 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 level of natural and artificial radionuclides in the samples does not exceed the established maximum permitted values.

Waste management

During 2016, all laws and bylaws on waste management were applied to the existing waste management system in JP Elektroprivreda BiH. In 2016, our company continued the trend of improving waste management systems, 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 all power distribution subsidiaries, until its final disposal.

In 2016, a total of 25,752 tons of non-hazardous waste was generated in JP Elektroprivreda BiH, of which 24,544 tons in TPP Kakanj, 534.62 tons in TPP Tuzla, 107 tons in the HPPs on river Neretva, and a total of 566 tons of non-hazardous waste in power distribution subsidiaries (power distribution subsidiaries: Sarajevo, Tuzla, Zenica, Bihać and Mostar).

In the Subsidiary „Elektrodistribucija“ Sarajevo, on sHPP „Osnica 1“, regular cleaning of the Osanica river bed and water catchment maintenance were carried out and about 68 kg of floating waste was collected and disposed in an adequate manner. Also, 934 m3 of the alluvial deposit was collected and disposed of.

The total amount of hazardous waste in 2016, produced in JP Elektroprivreda BiH, is 158.63 tons, of which 23.68 tons in TPP Kakanj, 67.51 in TPP Tuzla, 33.94 tons in HPPs on river Neretva, and a total of 33.5 tons of hazardous waste in

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

The total amount of slag and ash in TPP Tuzla and TPP Kakanj is 1,500,635 tons.

The amount of municipal waste (alluvial-floating waste from the reservoir) in 2016 in HPPs on river Neretva (plants HPP Jablanica, HPP Grabovica and HPP Salakovac) amounted to 299 m3, and the amount of mixed municipal waste in all three plants was 264.36 m3.

Complete 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.

Water used for electric power generation in HPPs on river Neretva

Table 5. Water used in HPPs on river Neretva

Hydro power plant	Used water m ³
HPP Jablanica	3.044.670.000
HPP Grabovica	3.409.880.000
HPP Salakovac	3.900.950.000
TOTAL:	10.355.500.000

BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

environmental Protection

Maintenance of transmission line route

In order to protect and secure access roads in case of faults on 35 kV transmission line for the purposes of Subsidiary HPPs on river Neretva, Jablanica, regular cutting of tree branches and clearing of the route was done

Fish stocking

According to the current Fishing grounds and submitted Annual fishing improvement programs for restocking the Neretva river basin, as well as to the Agreements with fishing associations that manage the Neretva river basin, U/OSR „Neretva 1933“ Mostar, OSR „Glavatica“ Jablanica, UG „OSR „Konjic“ Konjic, we made a regular annual restocking of water in the catchment of the river Neretva, as follows

1. **UG „OSR KONJIC“ Konjic**
Supply of fish: soft-mouth trout (3–15 cm)
2. **OSR „Glavatica“ Jablanica**
Supply of fish: Carp (250–1000 g)
3. **U/OSR „NERETVA 1933“ Mostar**
Supply of fingerlings and fish: Rainbow trout (15–20 cm)
Supply of fingerlings and fish: Brook char (15–25 cm)
Supply of fingerlings and fish: Soft-mouth trout (5–10 cm)
Supply of fingerlings and fish: Carp (500–1000 g)
4. **Restocking of SRTD „Ramske vode“ Prozor-Rama**
Supply of fingerlings and fish: Rainbow trout (15–20 cm)

environmental Protection

Electric Power Company





basic indicators of environmental
impact and environmental
protection measures

02

BASIC INDICATORS OF ENVIRONMENTAL IMPACT
AND ENVIRONMENTAL PROTECTION MEASURES

Elektroprivreda of Bosnia and Herzegovina

Power distribution
subsidiaries
preservation and protection of the environment

POWER DISTRIBUTION SUBSIDIARIES

ED Sarajevo

Use of transformer oil

Subsidiary "Elektrodistribucija", Sarajevo, has a workshop for overhaul of transformers at Azići - Ilidža Municipality. 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 2016, 4,474 kg of

non-chlorated insulating oil and heat transfer oil based on mineral oil was spent.

Waste management

At sHPP „Osanica 1“, regular cleaning of the bed of the river Osanica and maintaining of water catchment were performed. Approximately 68 kg of floating waste was collected and disposed of in an appropriate manner. Also, about 934 m3 of the alluvial deposit was collected and disposed of.

Measures to mitigate negative impacts on the environment

Based on the Agreement on improving fish stocks in the basin of the River Osanica and Plan for restocking the fishing area of Bosnia-Podrinje Canton Goražde, regular annual fish stocking was conducted.

The service of clearing the transmission route from branches and trees is regularly contracted with the third parties.

BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

Power distribution subsidiaries

environmental Protection

Elektroprivreda of Bosnia and Herzegovina

ED Tuzla

Waste management

- During 2016, three bins for selective waste collection were purchased.
- The collector system for the collection and treatment of waste water from "dirty surfaces" in the part of the Subsidiary which is most exposed to the risk of oil leakage was constructed.
- The separator for oily water from the storage of transformer oil (new and waste) from the area of the future waste storage and from objects TS 35/10 kV was also constructed.
- Complete unusable, dismantled material and equipment, which is treated as secondary raw material, was prepared for the purchase by the contracted waste operator.

Measures to mitigate negative impacts on the environment

The regular fish restocking of the basin of the River Brzava was performed, with the quantity of fish fingerlings as envisaged by Fishing grounds.

ED Zenica

Measures to mitigate negative impacts on the environment

Cutting of vegetation below the power distribution network was carried out in the Zenica - Doboje and Central Bosnia Canton, all in order to increase the reliability of the route and reduce the number of outages of the power facilities.

ED Bihać

Use of transformer oil

Within the process of production and maintenance of power facilities in hydro power plants, biodegradable hydraulic oils and grease were used. Used oil is temporarily deposited and prepared for final disposal by authorized companies. No cases of uncontrolled oil spillage have been recorded.

Waste management

The process of selling secondary raw materials and waste materials was launched, which was completed in late 2016.

Measures to mitigate negative impacts on the environment

Based on the Annual Restocking Plan and the submitted Elaborate on the Rehabilitation of Fishing Areas harmonized with the Fishing Grounds, co-financing of restocking the river Una was agreed.

ED Mostar

Measures to mitigate negative impacts on the environment

The contract on final disposal of collected categories of waste was signed with a licensed company in 2016.



Environmental Protection

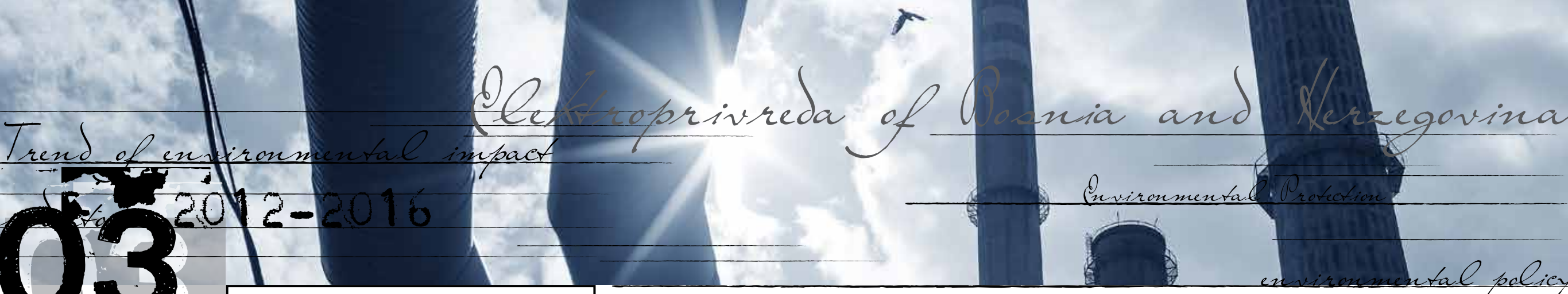
Trend of environmental impact indicators 2012-2016

TREND OF ENVIRONMENTAL IMPACT INDICATORS 2012 - 2016

Electric Power Company

Elektroprivreda of Bosnia and Herzegovina

Environmental Protection



Elektroprivreda of Bosnia and Herzegovina

Trend of environmental impact

Environmental Protection

environmental policy

03
2012-2016

**TREND OF ENVIRONMENTAL
IMPACT INDICATORS 2012 - 2016**

Diagram 5. Total electric and thermal power generation in JP Elektroprivreda BiH d.d. - Sarajevo for the period 2012 - 2016

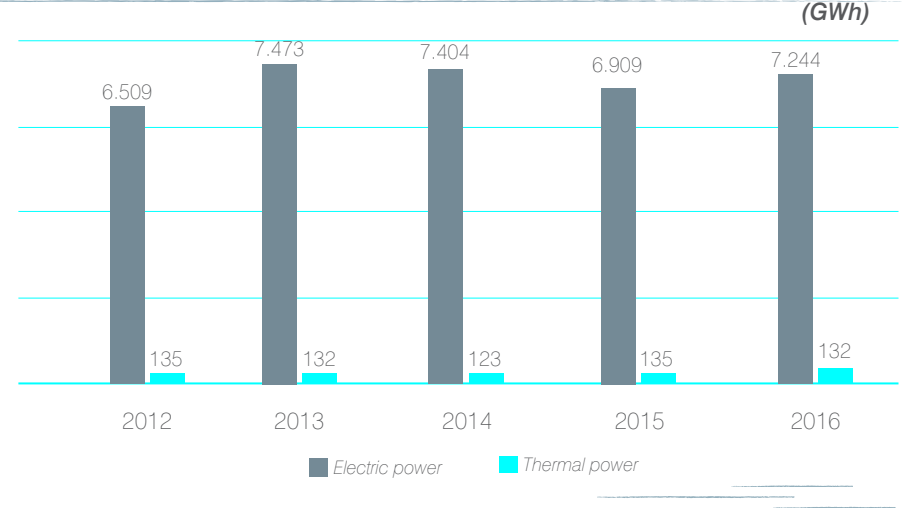
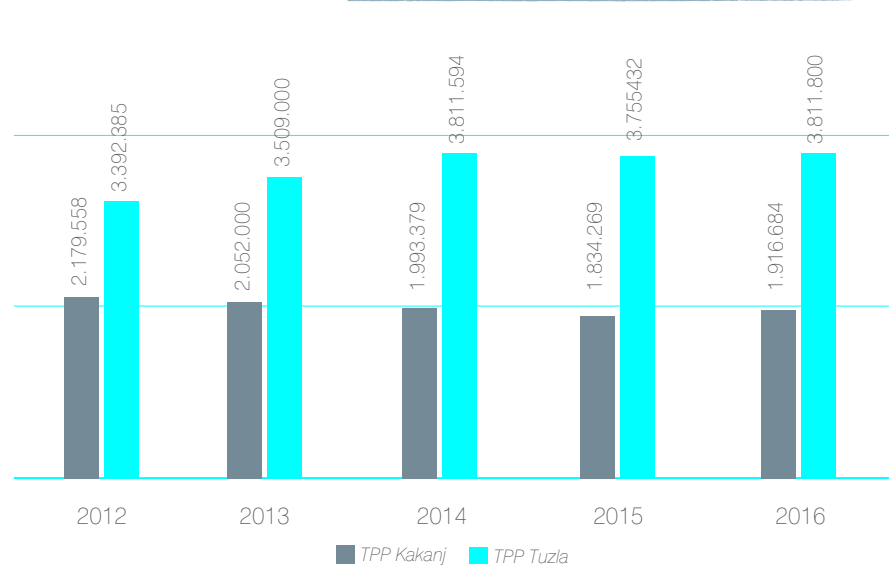


Diagram 7. Coal consumption in thermal power plants for the period 2012 - 2016 (t)



TERMOELEKTRANE

Diagram 6. Electric power generation in thermal power plants for the period 2012 - 2016 (GWh)

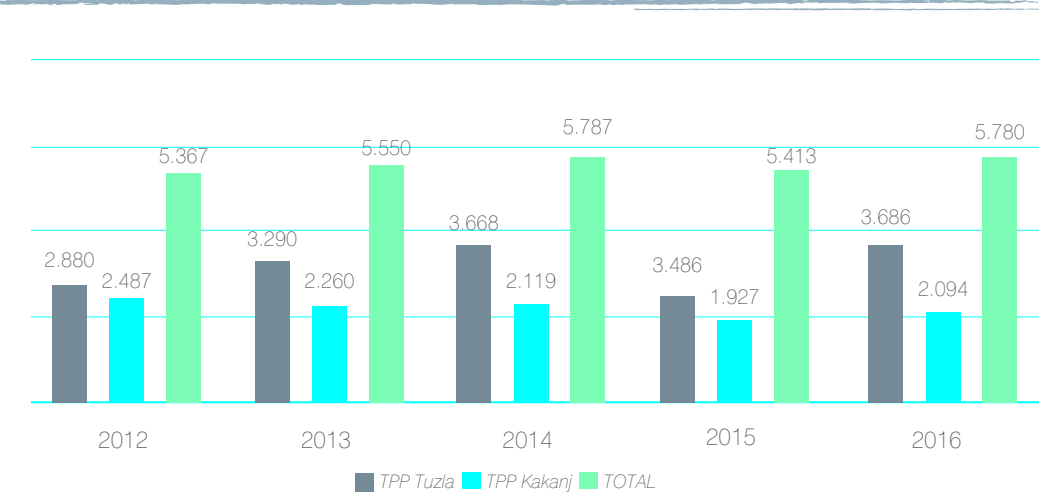
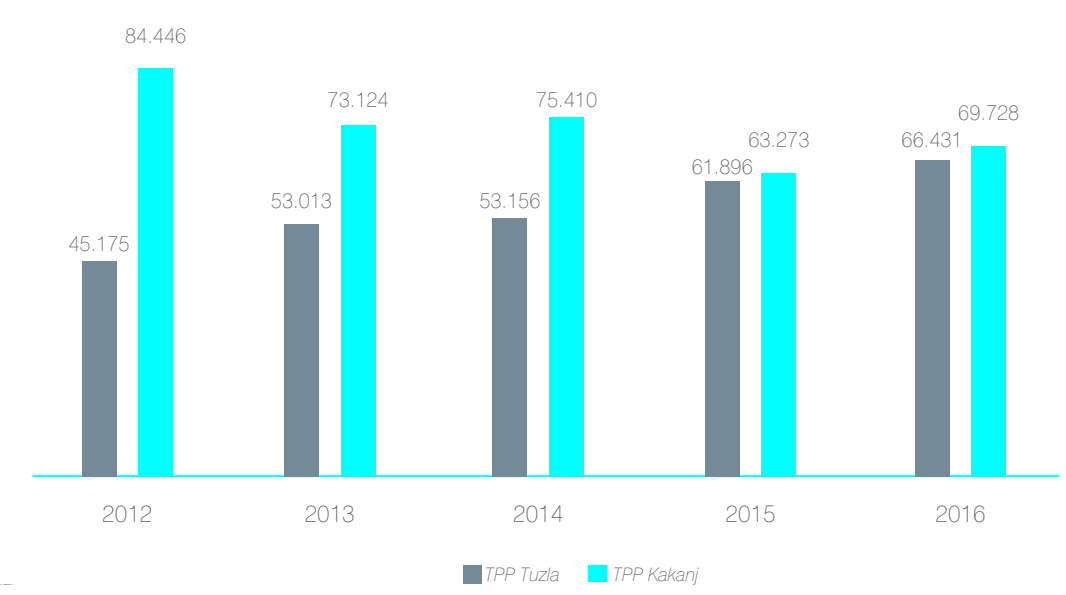


Diagram 8. Emission of SO₂ from thermal power plants Kakanj and Tuzla for the period 2012-2016 (t)



TREND OF ENVIRONMENTAL
IMPACT INDICATORS 2012 - 2016

Diagram 9. Emission of NOx from thermal power plants Kakanj and Tuzla for the period 2012-2016 (t)

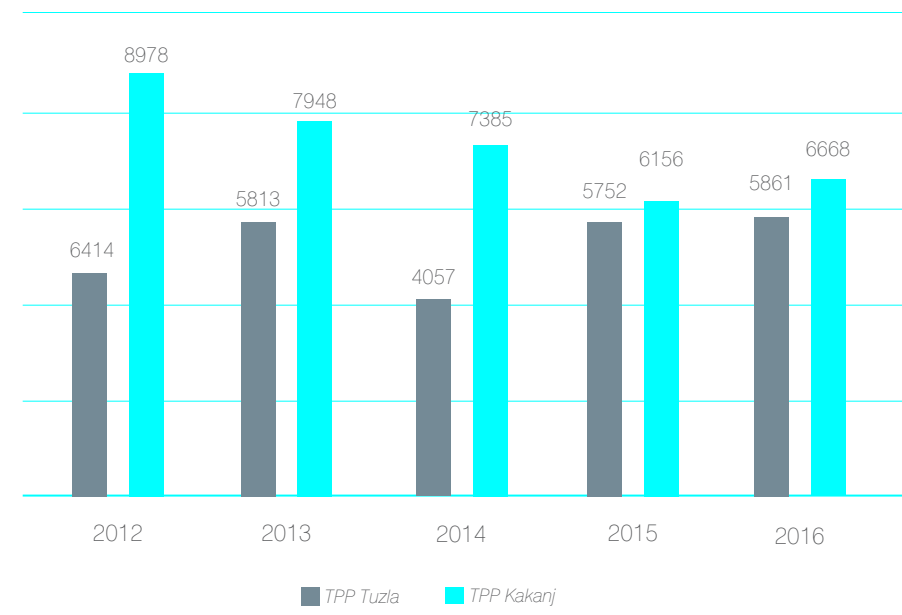


Diagram 11. Emission of CO2 from thermal power plants Kakanj and Tuzla for the period 2012 - 2016 (t)

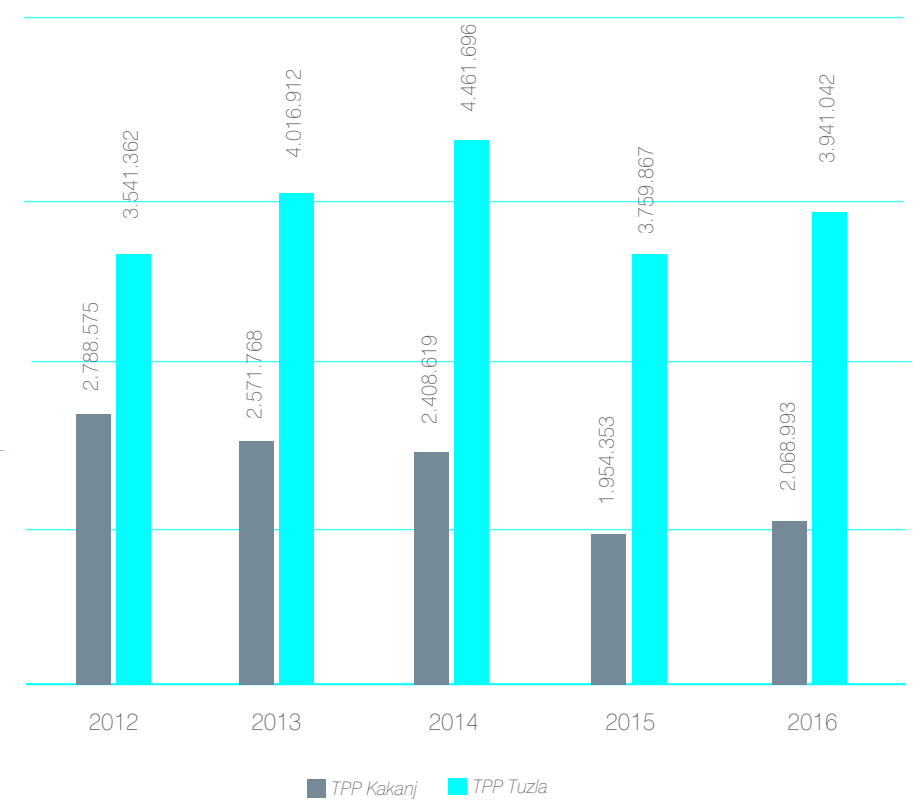
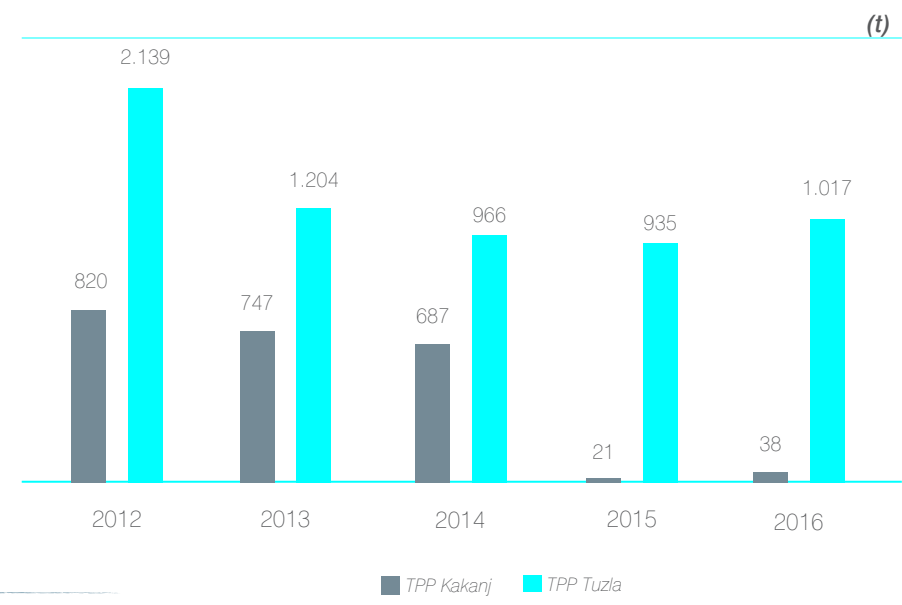


Diagram 10. Emissions of solid particles from thermal power plants Kakanj and Tuzla for the period 2012-2016 (t)



TREND OF ENVIRONMENTAL IMPACT INDICATORS 2012 - 2016

Diagram 12. Total quantity of non-hazardous waste and hazardous waste* in thermal power plants Tuzla and Kakanj for the period 2012 - 2016

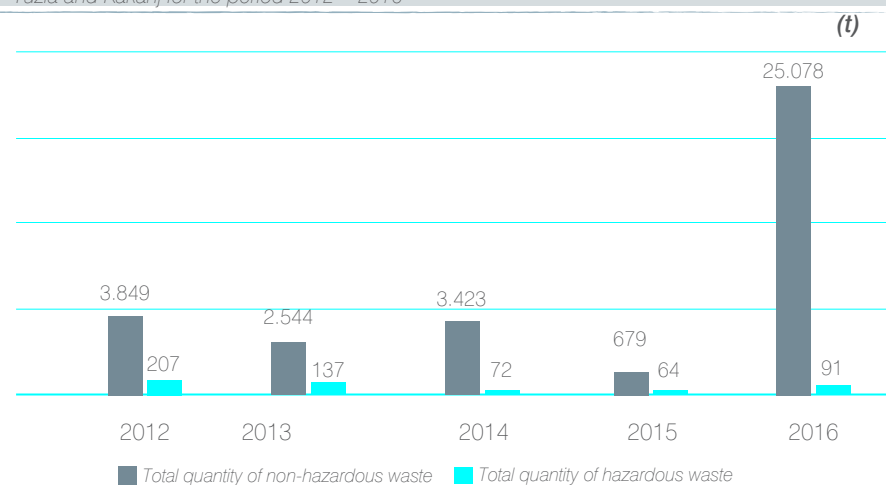
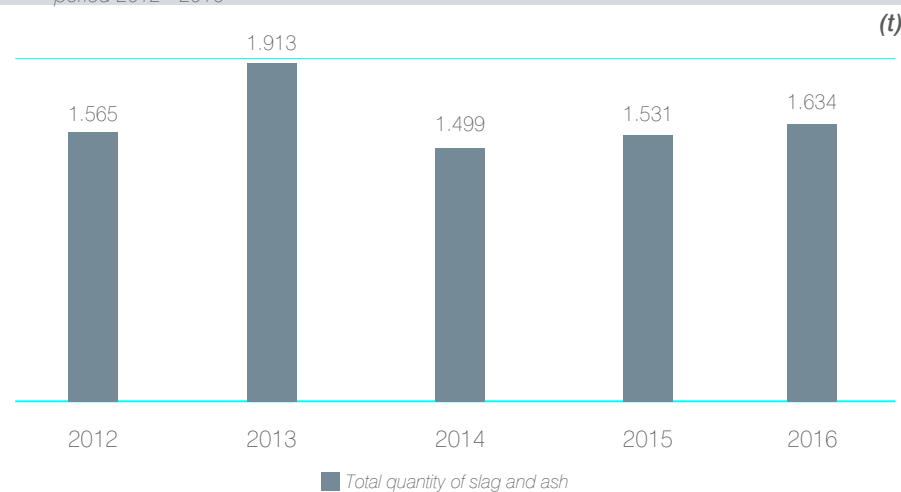
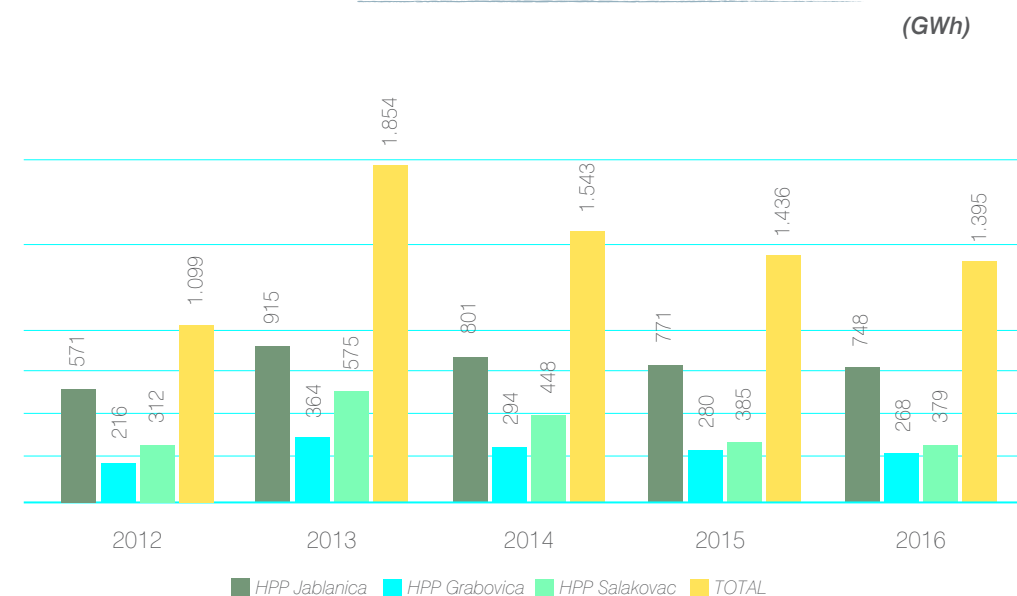


Diagram 13. Total quantities of slag and ash in thermal power plants Tuzla and Kakanj for the period 2012 - 2016



HPPs ON RIVER NERETVA

Diagram 14. Electric power generation in HPPs on river Neretva for the period 2012 - 2016





Environmental Protection

Realization of conditions of environmental

and water permits
04

REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

Electric Power Company

Elektroprivreda of Bosna and Herzegovina



THERMAL POWER PLANTS

TPP Tuzla

Federal Ministry of Environment and Tourism, on 30/06/2016, issued a renewed Environmental Permit, under certain conditions and with a validity period of five years. The activities and measures for minimizing air emissions, which are prescribed by the Environmental Permit, are regularly carried out.

In order to fulfil the obligations from the Environmental Permit, the TPP Tuzla has defined projects and started the implementation. The objectives of the individual projects and the degree of their implementation in 2016 are listed below, as follows:

The Project „Building a closed system for circulating water in TPP “Tuzla”:

- the legal requirements on the quality of wastewater discharged into natural recipient have been met, since the quality of effluents will comply with the Ordinance on Limits of Hazardous and Noxious Substances for Process Waste Water prior to discharge into the Public Sewerage System or Other Receiver (“Official Gazette of FBiH”, No.: 50/07);
- the discharge of wastewater and pollution load into the recipient of Jala reduced by up to 80%;
- pre-treated wastewater (oily wastewater, sanitary sewage waste water, surface precipitation water);
- separately treated excess wastewater from the hydraulic slag and ash transport system;
- the most polluted waste water (water returned from slag and ash disposal site, total industrial wastewater, wastewater from desalting of cooler, part of waste water from GPO and groundwater from coal deposits) primarily included into the closed hydraulic slag and ash transport system;
- unnecessary investment in the construction of a new retention pool due to the use of the collection ring of the cooling tower no. 2 as a retention pool.

The Project of building a closed system for circulating water is in the final stage. The contract was signed for the demolition of the cooling tower and external supervision was agreed. The Federal Ministry of Physical Planning has issued the Use permit for the works executed on the said project.

The Project of the removal of electrostatic precipitators of units 1 & 2

Electrostatic precipitators of units 1 & 2 have been removed in accordance with the conditions of the Environmental Permit. The project has been completed.

The Project “Preparatory activities for the construction of slag and ash landfill at the Open Pit „Šiški Brod”

The construction of the landfill will provide:

- continuation of operations of TPP “Tuzla”,
- provision of space for slag and ash disposal,
- disposal of slag and ash in an environmentally acceptable manner, and
- reclamation of PK “Šiški” after completion of exploitation.

Project of Adaptation of ecological monitoring system according to the Ordinance 09/14

In order to fulfil the provisions of the Ordinance on monitoring the emissions of pollutants into the air (“Official Gazette of the Federation of Bosnia and Herzegovina”, No. 9/14) related to continuous monitoring, the project “Adaptation of ecological monitoring system according to the Ordinance 09/14” was contracted. The purpose of the Project is to modify and upgrade the system for units 3,4,5 and 6.

In addition to the mentioned projects, TPP “Tuzla” paid great attention to the accuracy and reliability of the air emissions measurement system. In this respect, the following was carried out:

01. Servicing of gas analyzers in the system of pollutant emission into the air.
02. Servicing of gas analyzers of pollutant emission into the air of unit 5.
03. Checking the devices for measuring the emissions of pollutants into the air

REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

04

environmental policy

Environmental Protection

Elektroprivreda Bosnia and Herzegovina

TPP Kakanj

Review of the state of implementation of obligations from environmental permit

Arrangement of slag and ash landfill

- The landfill has been fenced on the north, west and east sides.
 - The final activities ongoing on the realization of technical and biological re-cultivation of the areas on which the slag and ashes are permanently deposited - Phase II
 - Procurement of slag and ash conveyors was carried out.
 - A part of the preparation of surfaces for slag and ash disposal has been completed.
 - Activities are ongoing on the rehabilitation of the Slapnički Potok collector.
 - Activities are ongoing for the expansion and rehabilitation of the existing facility for wetting the ash before disposal at the landfill.
 - Main Design for extending the Landfill spray system is being prepared.
- In addition, silver spruce was planted, and the irrigation system, type "drop by drop" was installed.
 - Analytical measurements and control techniques, as well as data analysis, are used continuously, with the overall goal of reducing water consumption and the amount of generated waste and waste water.
 - A control site was established, and the system for continuous monitoring of quantitative and qualitative characteristics of process waste water from the thermal power plant was established on it.
 - In order to improve the waste management system, activities on the construction of niche for containers have been completed.

REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

Review of the state of implementation of obligations under the Water Permit of TPP Kakanj

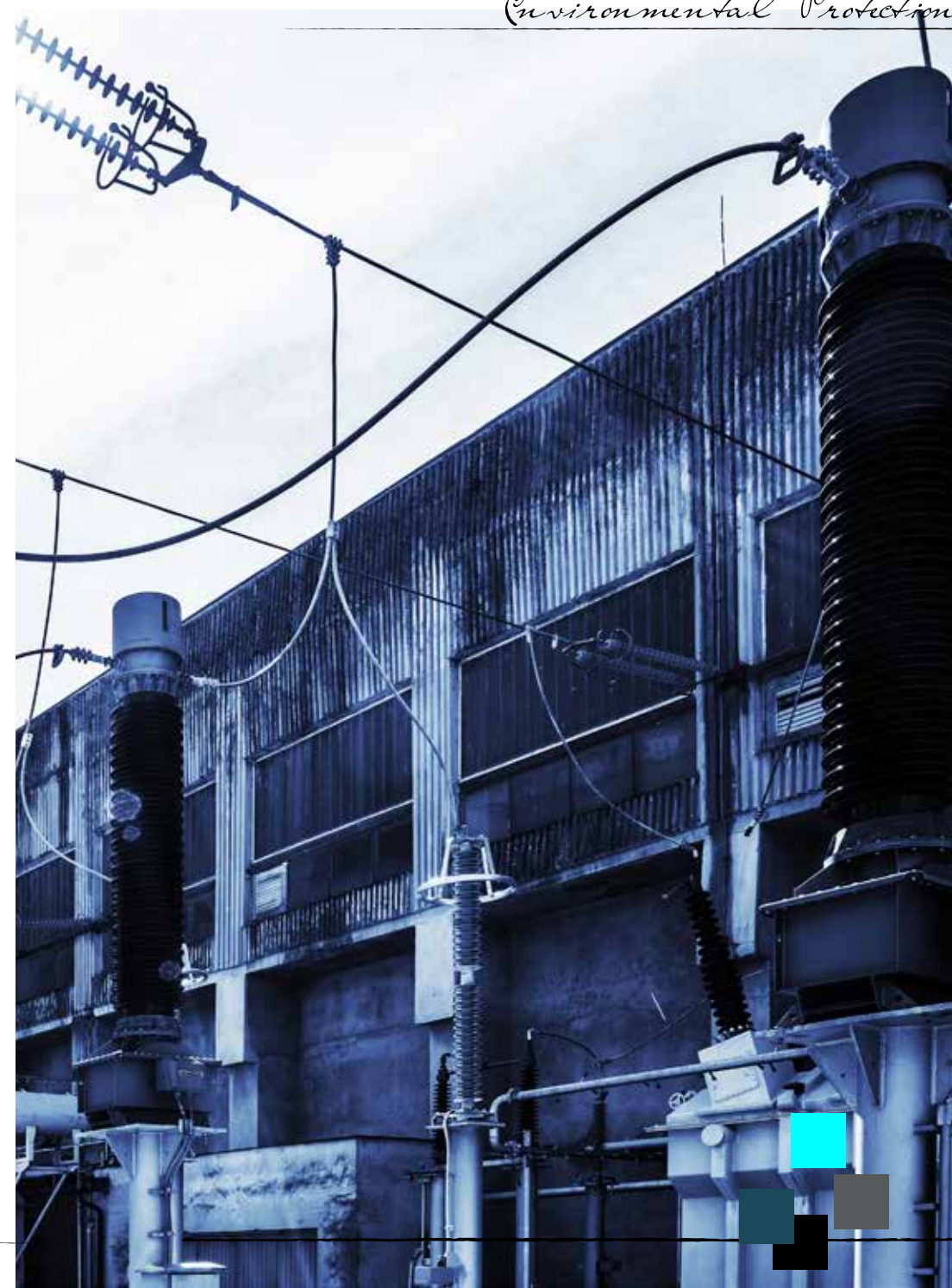
- The Program for monitoring the quality and quantity of wastewater, including the discharge of purified rainwater, has been prepared.
- Tank was tested in accordance with JUS M.Z.3.014 for waterproofing.
- When washing boilers in TPP Kakanj, waste water and waste sludge, and the oiled precipitate during the cleaning of the fuel tank is solved appropriately and the water management inspection is notified in order to control the whole process.
- Objects are maintained with the purpose of removing and purifying contaminated waters, i.e. for ensuring their correctness and functionality. Cleaning the facilities for treatment, removal, storage and final disposal of hazardous waste is carried out exclusively by the company authorized for that type of activity. Thermal power plant is obliged to regularly keep a log about the discharge and disposal of the content of precipitator and the oil and fat separator, which it does regularly.
- All drains that are not necessary are put out of function. Only compulsory drains are left, which are used only under supervision.
- Storage of all waste materials occurring in the process, that can affect the surface and ground water, are regularly stored in suitable containers and drums, until the authorized company takes them over.
- Given that the Water Permit expires at the end of 2016, TPP Kakanj has applied for a new Water Permit.

HPPs ON RIVER NERETVA

According to the valid environmental permits for the plants HPP Jablanica, HPP Grabovica and HPP Salakovac, the following activities are regularly conducted:

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

According to valid water permits, activities are regularly conducted.



REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

Elektroprivreda Bosnia and Herzegovina

POWER DISTRIBUTION SUBSIDIARIES

ED Sarajevo

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

ED Tuzla

The following energy facilities belong to the subsidiary "Elektrodistribucija" Tuzla: sHPP "Modrac" in Lukavac and sHPP "Snježnica" with hydro reservoir in Teočak. For the facilities of sHPP "Modrac" Lukavac and sHPP "Snježnica" the Subsidiary has the valid environmental and water permits, and for the hydro reservoir "Snježnica" the applications have been submitted for issuing new water and environmental permits.

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.
- Fish restocking of the Brzava River basin, once a year.

ED Bihać

Monitoring of process waters was carried out for the HPP "Una Kostela" facility. According to monthly reports for the period of 12 months (January-December 2016) and final report on the work of hydro power plants, there were no negative impacts on the environment.

ED Mostar

In accordance with the legal regulations, the quality of oil pits in masonry TSs 35/10 kV and 20(10)/04 kV is continuously monitored and interventions are made if necessary.



conservation and protection of the environment

Environmental Protection

Electric Power Company

05

environmental management
systems

environmental policy

environmental
policy

ENVIRONMENTAL MANAGEMENT SYSTEM

Elektroprivreda Bosnia and Herzegovina

ENVIRONMENTAL MANAGEMENT SYSTEM

THERMAL POWER PLANTS

TPP Tuzla

In 2016, the certification company conducted a control audit of the Integrated Business Management System of TPP "Tuzla".

After the completion of the audit, the certification company assessed that the Integrated Business Management system of TPP "Tuzla" is fully compliant with international standards: ISO 9001:2008 and ISO 14001:2004.

TPP Kakanj

An external and supervisory audit of the Environmental Management System was executed in mid-June 2016. A new certificate of compliance with the requirements of the standard BAS EN ISO 14001:2006 was issued.

Regular internal audit of Environmental Management System was carried out at the end of 2016, and the assessment of the compatibility of work of TPP Kakanj with legal and other environmental requirements was initiated.

Improving Environmental Management System is largely manifested through an increased level of implementation of the requirements of standard BAS EN ISO 14001:2006. In addition, the implementation of the Environmental Management System requirements under this Standard has proved to be an excellent tool in systemic approach and implementation of numerous environmental legal requirements, i.e. standards from the domain of environmental management.

**ENVIRONMENTAL
MANAGEMENT SYSTEM**

*environmental management
systems*

05

Neretva Hydroelectric power plants

HPPs ON RIVER NERETVA

HPPs on River Neretva

The program was developed to improve the Integrated Management System (IMS) for 2016, on the basis of which the following activities were carried out:

- The Report on the implementation of the IMS Improvement Program was completed in October 2016.
- The orders were carried out in terms of improving the IMS from supervisory audit of 2015;
- A review of the IMS documents was conducted (Management review).
- An internal audit was conducted in all facilities/sectors in the period from May to June 2016.
- 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 in October 2016;
- The 2nd Supervisory Audit of Integrated Management System in the Subsidiary HPP on river Neretva was conducted by representatives of authorized certification body, according to the requirements of standards EN ISO 9001:2008 and EN ISO 14001:2004.

environmental policy

**ENVIRONMENTAL
MANAGEMENT SYSTEM**

*Upravljam prirodu i
priroda upravlja nama*

POWER DISTRIBUTION SUBSIDIARIES

*environmental management
systems*

05

Elektroprivreda Bosna and Hercegovina

ED Sarajevo

In order to build an integrated management system, in 2016, the activities continued on preparation of the establishment and implementation of the Environmental Management System and the Health and Safety at Work Protection System and integration with the Quality Management System of the Subsidiary "Elektro distribucija" Sarajevo.

ED Tuzla

Surveillance Audit for the extension of validity of the Certification of Environmental Management System BAS EN ISO 14001, was carried out in 2016, with the certification of the system according to ISO 9001, which together form 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 and preventive actions.

environmental policy

Environmental Protection

Unit 7-Unit 8

006

production of electrical and thermal energy

Elektroprivreda Bosna and Hercegovina

CAPITAL INVESTMENTS

Electric Power Company

Unit 7-Unit 8

Elektroprivreda Bosna and Hercegovina



capital investments

Elektroprivreda Bosna and Hercegovina

06

Unit 7 - Unit 8
CAPITAL
INVESTMENTS

environmental policy

THERMAL POWER PLANTS

Unit 7 - 450 MW in TPP Tuzla

In 2016, activities were continued on the implementation of the Contract for the Construction of the Replacement Unit 7 - 450 MW in TPP Tuzla, with the implementation of which the Thermal Power Plant Tuzla will obtain the production capacity of high efficiency and, accordingly, reduction of greenhouse gas emissions, without discharge of waste water. Replacement Unit 7 will have all the necessary elements to enable it to be built in accordance with the best available techniques for combustion plants - LCP BAT (Best Available Techniques) and the limit values for emissions of pollutants will be aligned with part of Directive 2010/75/EU Industrial Emissions (IED) relating to combustion plants (Chapter III, Annex V).

Federal Ministry of Environment and Tourism issued a renewed Environmental Permit on 18/07/2016.

Unit 8 - 300 MW in TPP Kakanj

The Terms of Reference was prepared - for the innovation of the Preliminary Design of the Replacement Unit 8 of TPP Kakanj. According to the Terms of Reference, changes were proposed in relation to the Investment, Technical and Environmental Documentation prepared in 2010.

Tender documents were prepared for the selection of the contractor for the creation of the Innovated Preliminary Design.

Unit 7 - Unit 8

Thermal power plants

Thermal power plant

Unit

7

Hydro power plant Janjići

The Environmental Impact Assessment Study was completed, on the basis of which the Environmental Permit was obtained from the competent ministry. Continuous monitoring of the piezometers is ongoing, which represent activities that were realized in 2016.

HPP Una Kostela

The Environmental and Social Impact Assessment Study of HPP "Una" Kostela was completed. The purpose of the Study is to estimate the possible impacts of HPP "Una" Kostela on the environment during its reconstruction and extension as well as during the exploitation after the completed works.

The Environmental and Social Impact Assessment Study was completed in December 2016, and after that, it was submitted to the Federal Ministry of Environment and Tourism in order to obtain the Environmental permit.

Also, in 2016, the preparation of the Study on research works on environmental flow of the river Una on the profile of HPP Una Kostela was continued, with the aim of analyzing the ecological status of the water body under the impact of the hydroelectric power plant. Within this Study, the implementation of hydrological, biological, physical and chemical research on the locality of HPP "Una" Kostela is envisaged, based on which the EF will be determined which ensures the fulfilment of the water management goals, and in particular the achievement of a good ecological status, i.e. potential of surface water bodies under the influence of this production plant. The Study envisages the following activities:

- Exploration of the current status of river Una in the area of impact of the hydro power plant,
- Determination of ecological status/potential of water body,
- Defining and analyzing the necessary measures for achieving good ecological status, and
- Elaboration of results



Hydro Power Plant Babino Selo

Completed activities in 2016 are the preparation of: Preliminary Environmental Impact Assessment and Plan for Inclusion of Stakeholders in the HPP Babino Selo Project, and work on the Environmental Impact Study, which is scheduled to be completed by mid-2017.

sHPP Kakanj on the river Bosna (on the dam of TPP Kakanj)

The Terms of Reference and tender documents for the preparation of the Preliminary Design, and the Economic Feasibility Study with the Preliminary Environmental Impact Assessment were prepared. The Sava River Basin Agency, at the request of JP Elektroprivreda BiH, issued a Preliminary Water Approval for the sHPP Kakanj.



Elektroprivreda Bosna i Hercegovina

07

PREPARATION OF PLANNING AND STUDY DOCUMENTS

Environmental Protection

environmental policy

podveležje

wind farm Podveležje

preparation of planning and study documents

wind turbines

Elektroprivreda Bosna i Hercegovina

*preparation of planning
and study documents*

environmental policy

Environmental Protection

preparation of planning and study documents

wind farm Podveležje

PREPARATION OF PLANNING AND STUDY DOCUMENTS

07

Elektroprivreda Bosnia and Herzegovina

Within the framework of Strategic Development, in 2016, the following projects were implemented:

- Environmental and Social Development Impact Assessment for WF Vlačić
- GAP analysis of WF Vlačić
- Heating of Živinice from TPP Tuzla (Study with the Revision of the existing Conceptual Design)
- The possibility of using waste wood and agricultural biomass in thermal power plants of JP Elektroprivreda BiH
- Feasibility Study on the heat energy supply of the area to/and Sarajevo from TPP Kakanj
- CoolHeating Project



FINANCIAL INVESTMENTS

Elektroprivreda Bosna and Hercegovina

Environmental Protection

Electric Power Company

environmental management system

environmental policy

financial investments

FINANCIAL INVESTMENTS

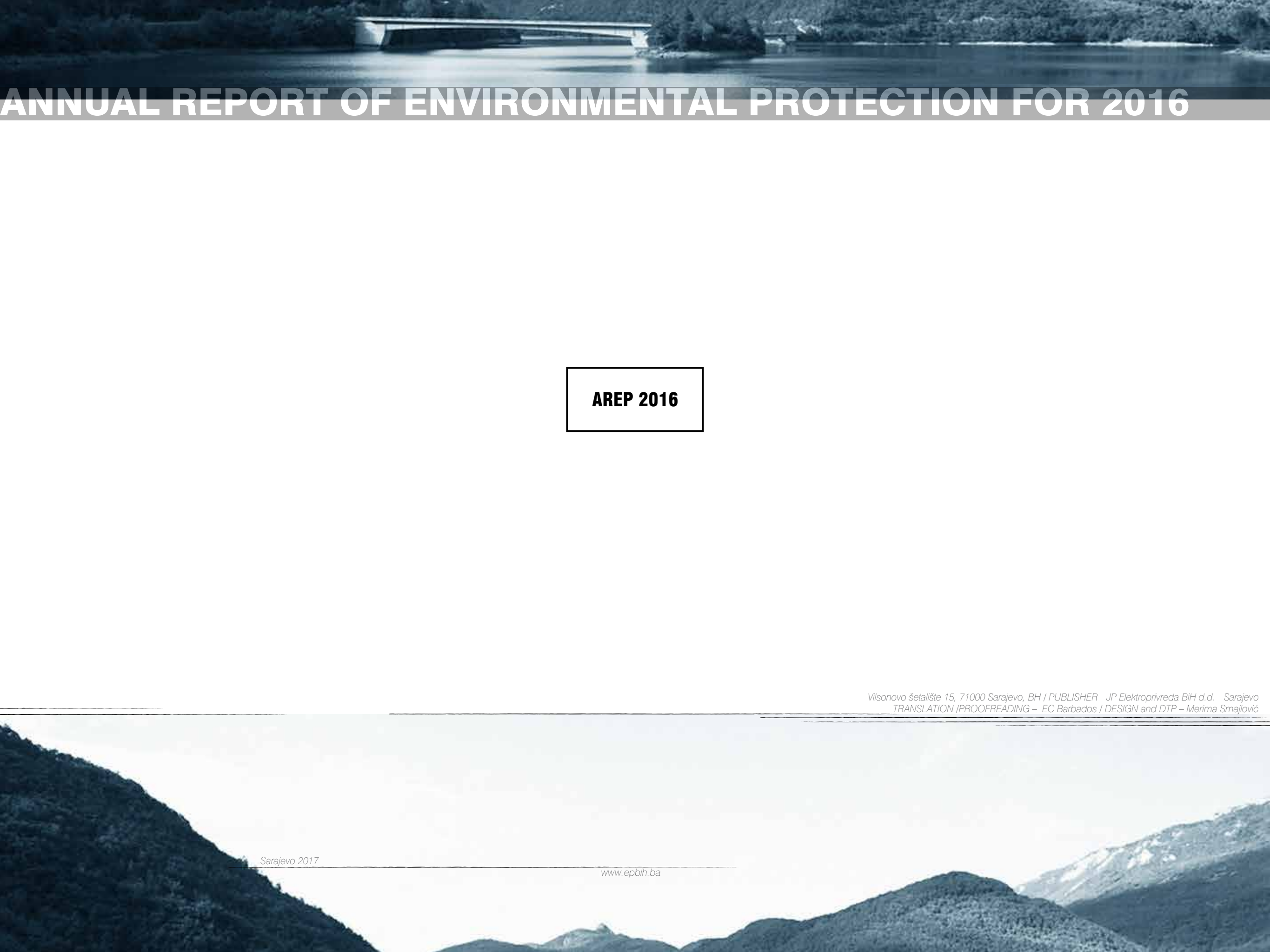
According to the data available for the preparation of this document, the total amount is 46,164,668 KM . This indicator is a confirmation that environmental protection is an important part of the total business of our company also in financial aspect.

The Table 9, according to available data, provides financial indicators by subsidiaries, at the level of the Company Directorate, and the total for JP Elektroprivreda BiH d.d. – Sarajevo.

FINANCIAL INVESTMENTS

Table 9. Financial indicators of activity in the domain of environmental management

Organization	(KM)
Subsidiaries:	
TPP Tuzla	10.565.395
TPP Kakanj	601.011
HPP on River Neretva	1.806.643
ED Sarajevo	578.342
ED Tuzla	620.074
ED Zenica	1.650.22
ED Bihać	446.791
ED Mostar	155.159
Fee for air pollution of TPP Tuzla	2.724.714
Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP	5.547.311
Fee for water protection	638.546
Fee for air pollution of TPP Kakanj	2.628.358
Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP	3.140.699
Fee for water protection	378.575
Contributions for hydro reservoir (HPP on river Neretva)	13.681.022
Fee for water protection HPP on river Neretva	5.766
Company Directorate	
Sector for strategic development	110.000
Capital investments	681.107
Water charges and communal utilities services	204.935
UKUPNO:	46.164.668



ANNUAL REPORT OF ENVIRONMENTAL PROTECTION FOR 2016

AREP 2016

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