



# AREP 2015

*ANNUAL REPORT OF ENVIRONMENTAL PROTECTION FOR 2015*

## POWER AND THERMAL ENERGY GENERATION

In 2015, JP Elektroprivreda BiH in its production facilities has achieved the total electricity generation in the amount of 6,909 GWh, of which thermal power plants produced 5,413 GWh (TPP Tuzla 3,486 GWh and TPP Kakanj 1,927 GWh), and hydro power plants 1,496 GWh (HPP on Neretva 1,436 GWh and sHPPs 60 GWh) (Diagram 1).

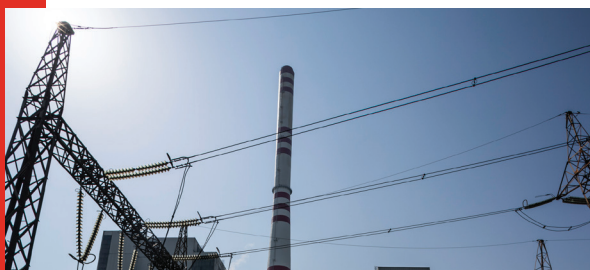


Diagram 1. Production of electricity and thermal energy in 2015

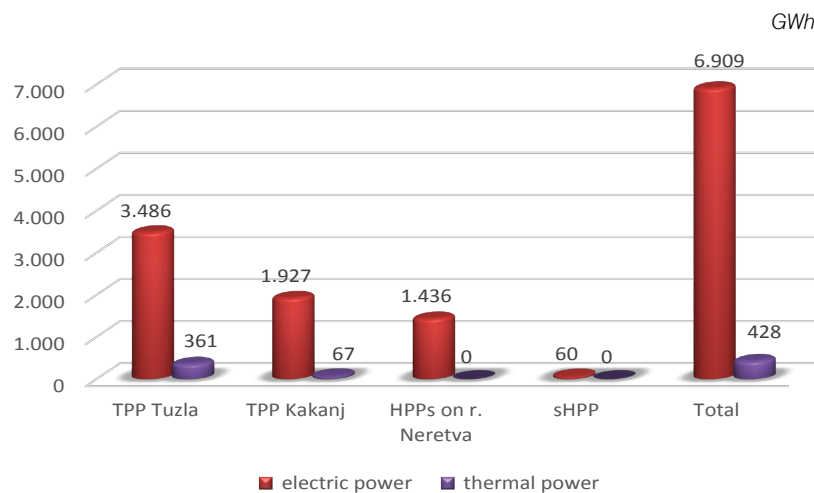
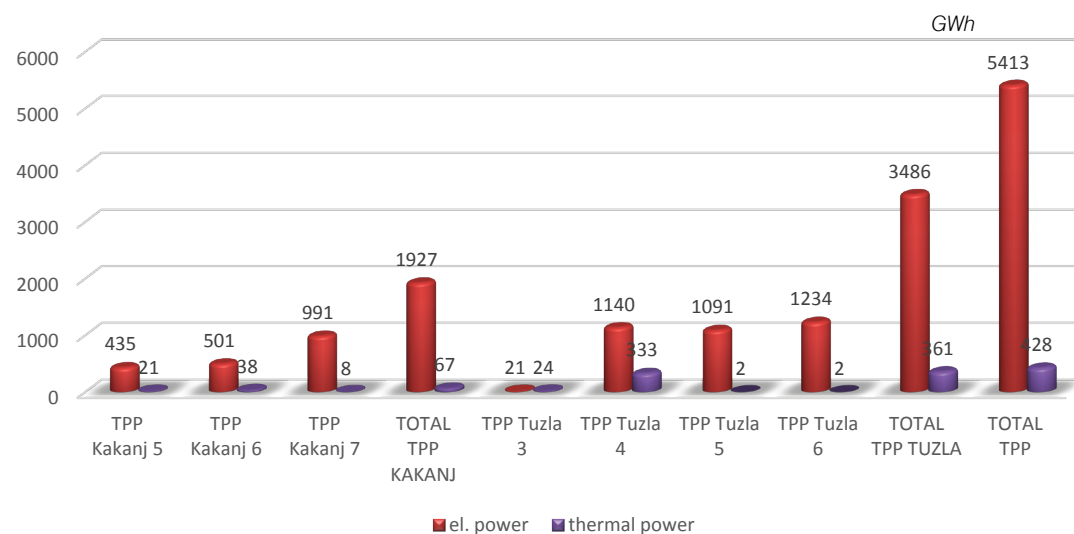


Diagram 2. Balance of the production of electricity and heat in TPP Tuzla and TPP Kakanj



## POWER AND THERMAL ENERGY GENERATION

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

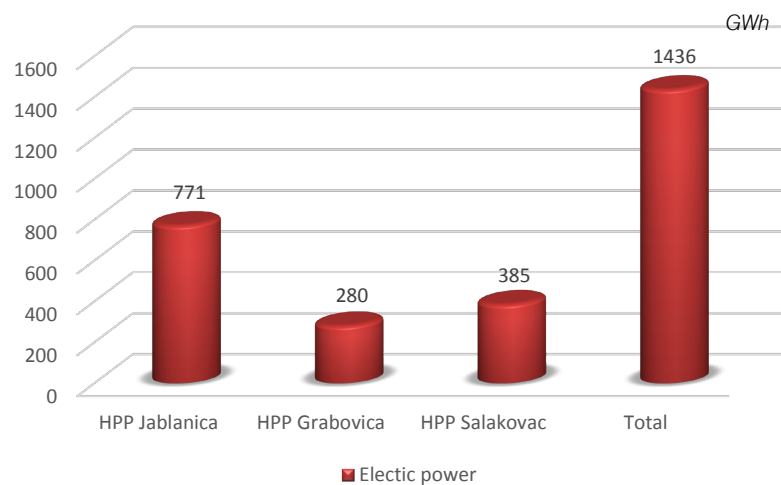
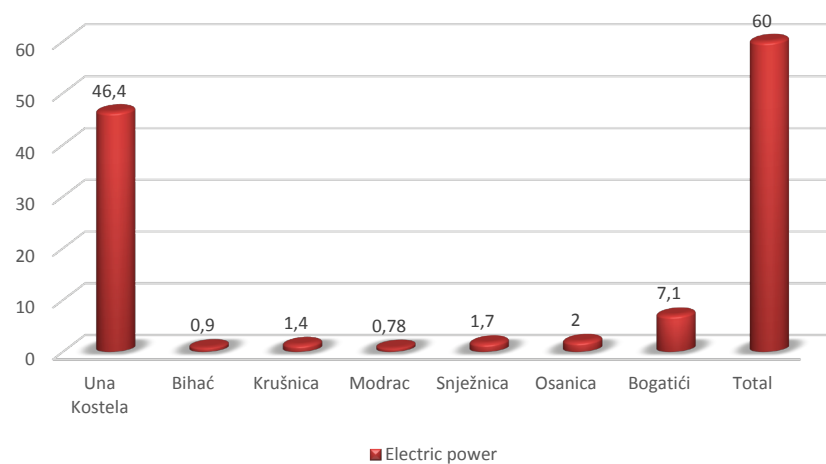


Diagram 4. Balance of the production of electricity in sHPPs



Operation of the electric power system of JP Elektroprivreda BiH in 2015 was characterized by:

- unfavourable hydrological conditions; total realized natural water inflows were 132.4 GWh or 6.1% lower than the planned, and 541 GWh or 21.0% lower than the inflows in the hydrologically more favourable 2014,
- total purchase of coal lower than balance-planned amounts lower by 756,056 tons, i.e. 12.0%, or 4.9% lower than the purchase in 2014,
- total electricity production lower by 742.0 GWh or 9.7% than planned, and 494.1 GWh or 6.7% lower than the production realized in 2014,
- total electricity consumption higher than the planned by 53.5 GWh or 1.1%, and 179.3 GWh or 3.6% lower than the total consumption in 2014,
- non-tariff sales of electricity lower by 509.2 GWh, i.e. 17.2% than the balance-planned one, and 329.8 GWh or 11.8% lower as compared to the sales in 2014.

In 2015, the total consumption was 5,589,701 tons of coal, of which 5,433,688 tons (97.2%) for electricity production, and 156,012 tons (2.8%) for thermal power and process steam production.

Table 1. Total annual coal consumption in 2015

| Power plant  | Coal consumption (t) |
|--------------|----------------------|
| PTT Tuzla    | 3,755,432            |
| PTT Kakanj   | 1,834,269            |
| <b>TOTAL</b> | <b>5,589,701</b>     |

## 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 2015, continued monitoring the air pollutant emissions from thermal power facilities – sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), solid particles, and carbon dioxide (CO<sub>2</sub>) emissions.

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

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

| Power Plant  | NO <sub>x</sub><br>t/yr | SO <sub>2</sub><br>t/yr | solid particlet/<br>yr | CO <sub>2</sub><br>t/yr |
|--------------|-------------------------|-------------------------|------------------------|-------------------------|
| TPP Tuzla    | 5,752                   | 61,896                  | 935                    | 3,759,867               |
| TPP Kakanj   | 6,156                   | 63,274                  | 21                     | 1,954,353               |
| <b>TOTAL</b> | <b>11,908</b>           | <b>125,170</b>          | <b>956</b>             | <b>5,714,220</b>        |

#### 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*

| Power plant | Used water<br>m <sup>3</sup> | Discharged water<br>m <sup>3</sup> | Population equivalent<br>(EBS) |
|-------------|------------------------------|------------------------------------|--------------------------------|
| TPP Tuzla   | 15,153,418                   | 4,028,444                          | 319,273                        |
| TPP Kakanj  | 10,329,301                   | 5,965,816                          | 36,442                         |

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.

## BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

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

| Thermal power plant | Name                      | Quantity (t) |
|---------------------|---------------------------|--------------|
| TPP Tuzla           | Hydrated lime             | 867          |
|                     | Sodium hydroxide          | 83.85        |
|                     | Ammonium hydroxide        | 1.8          |
|                     | Levoxine                  | 7.8          |
|                     | Trisodium phosphate       | 0.8          |
|                     | Nalco N- 3DT 199          | 2.6          |
|                     | Nalco N- 7348             | 0.9          |
|                     | Nalco-N -7359             | 25           |
|                     | Nalco-N- 3434             | 2.35         |
|                     | Nalco N- 3DT 149          | 16.9         |
|                     | Nalco N- 1700             | 0.26         |
|                     | Nalco N- 72310            | 0.25         |
|                     | Nalco N-71605             | 2.4          |
|                     | Nalco N- 71221            | 43.8         |
|                     | Sodium hypochlorite       | 23.15        |
|                     | Ferric sulphate technical | 36           |
|                     | Hydrochloric acid         | 293.3        |
| TPP Kakanj          | Hydrated lime             | 1713         |
|                     | Hydrochloric acid         | 569          |
|                     | Soda lye                  | 322          |
|                     | Iron (III) sulphate       | 260          |
|                     | Sodium hydroxide          | 83.8         |
|                     | Ammonium hydroxide        | 1.8          |
|                     | Potassium lye             | 0.1          |
|                     | Trisodium phosphate       | 2.17         |
|                     | NALCO N- 72.310           | 0.18         |
|                     | Sodium chloride           | 77.35        |
|                     | Sodium hypochlorite       | 7.70         |
|                     | Levoxine 15               | 10.40        |
|                     | Trisodium phosphate       | 2.2          |
|                     | NALCO N – 3DT 149         | 21.4         |
|                     | NALCO N – 3 dt 199        | 2.05         |
|                     | NALCO N – 7359            | 22.3         |
|                     | NALCO N – 3.434           | 0.6          |
|                     | NALCO pHREE 5200          | 20.9         |
|                     | NALCO 1700                | 0.4          |

### Radioactivity monitoring

In accordance with the “Rulebook on maximum limits of radioactive contamination of the environment and performing decontamination” (Official Gazette of SFRY 8/87, Official Gazette of RBiH 2/92) for TPP Tuzla and TPP Kakanj, a regular annual monitoring of radioactivity levels in the generation process and the nearby surroundings of the thermal power plants was realized.

In 2015, the Veterinary Faculty Sarajevo carried out the measurement of the radioactivity of slag and ash, and the measurement of radioactivity in the production process in TPP Tuzla, and it was established that the level of natural and artificial radionuclides in the samples does not exceed the established maximum permitted values, for which the Certificate was issued.

Also, radiological studies were continued in the production process and in the surrounding area of TPP Kakanj, as well as radiological studies of food of vegetable and animal origin located in the local community Slapnica, settlement Donja Slapnica.

A certificate was issued on the conducted studies, attesting that the measured level of natural and artificial radionuclides in the samples of slag and ash does not exceed the established maximum permitted values.

### Waste management

During 2015, all laws and bylaws on waste management were applied to the existing waste management system in JP Elektroprivreda BiH. In 2015, 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 launching the Project for construction of temporary waste storages in all power distribution subsidiaries, until its final disposal.

In 2015, a total of 1,394.21 tons of non-hazardous waste was generated in JP Elektroprivreda BiH, of which 678.72 tons in TPP Kakanj and TPP Tuzla, 47,28 tons in the HPPs on river Neretva, and a total of 668.21 tons of non-hazardous waste in power distribution subsidiaries (power distribution subsidiaries: Sarajevo, Tuzla, Zenica, Bihać and Mostar).

## BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

The total amount of hazardous waste in 2015, produced in JP Elektroprivreda BiH, is 108.03 tons, of which 63.48 tons in TPP Kakanj and TPP Tuzla, 10.73 tons in HPPs on river Neretva, and a total of 33.82 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 1,530,649 tons.

The amount of municipal waste (alluvial-floating waste from the reservoir) in 2015 in HPPs on river Neretva (plants HPP Jablanica, HPP Grabovica and HPP Salakovac) amounted to 322.35 m<sup>3</sup>, and the amount of mixed municipal waste in all three plants was 338.44 m<sup>3</sup>.

**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.**

In November 2015, the Subsidiary „Elektro distribucija“, Sarajevo, under the MedPartnership project, in coordination with the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina, surrendered for the permanent disposal the remaining amounts, 8,279 kg of hazardous waste with PCB. Containers with capacitors removed from the system of three-band network command (MTK system) filled with an insulating fluid based on PCBs, and barrels of oil, were taken over by a licensed company.

During 2015, the Subsidiary „Elektro distribucija“, Zenica participated in the implementation of the project under the Subcomponent 2.3.

“Environmentally sound management of equipment containing PCBs in national electricity companies in the Mediterranean countries (Albania, Bosnia and Herzegovina, Egypt and Turkey)”. Based on this project, hazardous waste from nodal transformer stations 35/10 kV in Zenica-Doboj Canton, was submitted to the permanent disposal of a licenced company, in the total amount of 8,200 kg. The sponsor of the project is the Ministry of Foreign Trade and Economic Relations of Bosnia and Herzegovina.



### Water used for electric power generation in HPPs on river Neretva

Table 5. Water used in HPPs on river Neretva

| Hydro power plants | Used water m <sup>3</sup> |
|--------------------|---------------------------|
| Jablanica          | 3,130,600,000             |
| Grabovica          | 3,607,850,000             |
| Salakovac          | 3,527,080,000             |
| <b>TOTAL:</b>      | <b>10,265,530,000</b>     |

### Maintenance of transmission line route of HPPs on river Neretva

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 restocking programs, 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, Mostar, we made a regular annual restocking of water in the catchment of the river Neretva, as follows:

- supply of carp fingerlings and fish (250 – 1.000 g) for restocking of fishing area - fishing zone Jablanica, Mostar, Konjic;
- supply of brown trout fingerlings and fish (3 – 30 cm), for restocking of fishing area - fishing zone Jablanica, Mostar, Konjic;
- supply of lake trout fingerlings and fish (15 – 20 cm) for restocking of fishing area - fishing zone Mostar;
- supply of arctic char fingerlings and fish (20 – 25 cm) for restocking of fishing area - fishing zone Jablanica, Mostar;
- supply of brook char fingerlings and fish (15 – 25 cm), for restocking of fishing area - fishing zone Mostar;
- supply of soft-mouth trout fingerlings (3 – 15 cm), for restocking of fishing area - fishing zone Mostar and Konjic;
- supply of rainbow trout fingerlings (15 – 20 cm), for restocking of fishing area - fishing zone Mostar.

## BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

### POWER DISTRIBUTION SUBSIDIARIES

#### ***Elektrodistribucija Sarajevo***

##### *Use of transformer oil*

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 2015 7368.97 kg of non-chlorated insulating oil and heat transfer oil based on mineral oil was spent. 66.2% less oil was used compared to the year 2014.

##### *Waste management*

In 2015, activities continued on the procurement of service for construction of the storage for temporary waste deposit in Azići, because all required documentation for construction was obtained.

At sHPP „Osanica 1“ regular cleaning of the bed of the river Osanica and maintaining of water catchment were performed. Approximately 48 kg of floating waste was collected and disposed of in an appropriate manner. Also, approximately 884 m<sup>3</sup> of 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.



#### ***Elektrodistribucija Tuzla***

##### *Measures to mitigate negative impacts on the environment*

During 2015, 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 implementation of the construction of separators for oily water from the storage of transformer oil (new and waste) from objects TS 35/10 kV is also ongoing.

The restocking of the basin of the River Brzava was performed, with the necessary amount of fish fingerlings.

#### ***Elektrodistribucija Zenica***

##### *Measures to mitigate negative impacts on the environment*

During 2015, electronic waste containing hazardous components was taken over and transported from Subsidiary “Elektrodistribucija”, Zenica (auxiliary storage Travnik „Plava voda“), by an authorized company.

Also, the regular maintenance service was carried out (construction and craft works on rehabilitation of transformer substations) in the Zenica-Doboj and Central-Bosnia Cantons, with the aim of mitigating negative impacts on the environment and increasing the reliability of the power facilities. Rehabilitation of substations was performed in accordance with the technical recommendations which include measures to protect the environment.

The maintenance service was also carried out, i.e. clearing under the route of electrical distribution grid in the Zenica-Doboj and Central-Bosnia Cantons, with the aim of increasing the reliability of the route and reducing the number of breakdowns on power facilities.

During 2015, the service of de-mining under the route of electric power facilities in Zenica - Doboj and Central - Bosnia Cantons was performed, all in order to decrease the load of UXO and provide employees with safe access to power plants, and increase the security of the population.

In the month of June and July 2015, secondary raw materials and waste materials were sold to a licensed company.

## BASIC INDICATORS OF ENVIRONMENTAL IMPACT AND ENVIRONMENTAL PROTECTION MEASURES

### ***Elektro distribucija Bihać***

#### *Use of transformer oil*

During regular maintenance of transformer, transformer oil was supplemented. In the activity of electric power generation, within the process of production and maintenance of power facilities in hydro power plants, biodegradable hydraulic oils and grease were used.

#### *Measures to mitigate negative impacts on the environment*

In 2015, the Central storage of power distribution Bihać was relocated. Also, in 2015, the Subsidiary „Elektro distribucija“ Bihać, on the basis of the Agreement on the transfer without fees of written off and derecognised computer equipment, transferred all of this equipment to public institutions, citizens' associations and other interested parties, with the obligation to recipients of the equipment to dispose the same after use in an environmentally sound manner.

### ***Elektro distribucija Mostar***

#### *Measures to mitigate negative impacts on the environment*

The contract on disposal of collected waste was signed with licensed companies.



## TREND OF ENVIRONMENTAL IMPACT INDICATORS 2011 – 2015



Diagram 5. Total electric and thermal power generation in JP Elektroprivreda BiH for the period 2011 – 2015

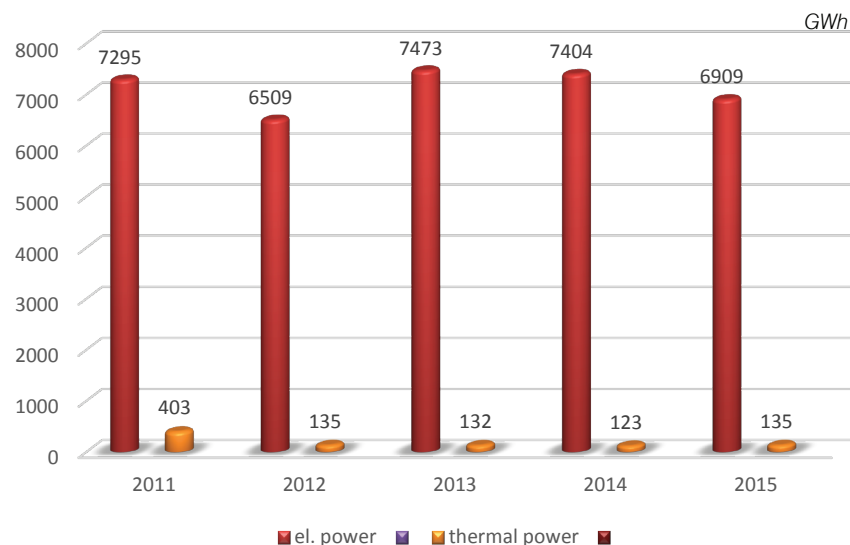
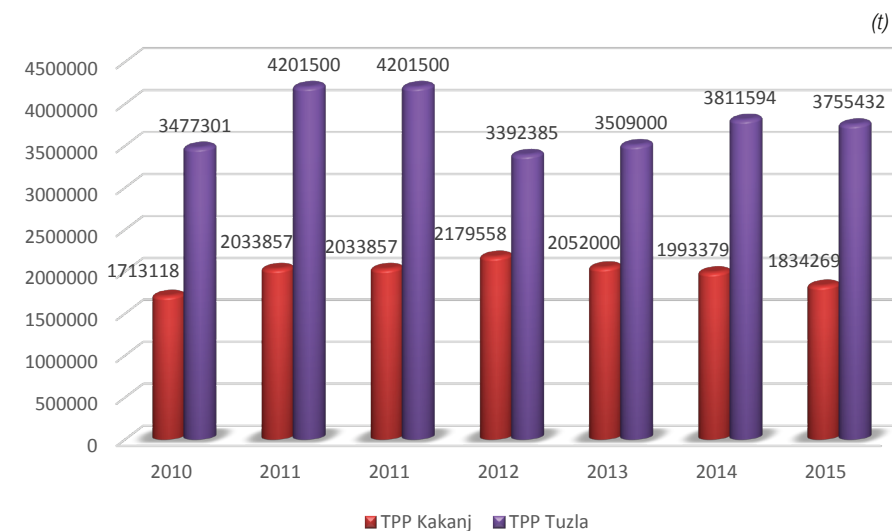
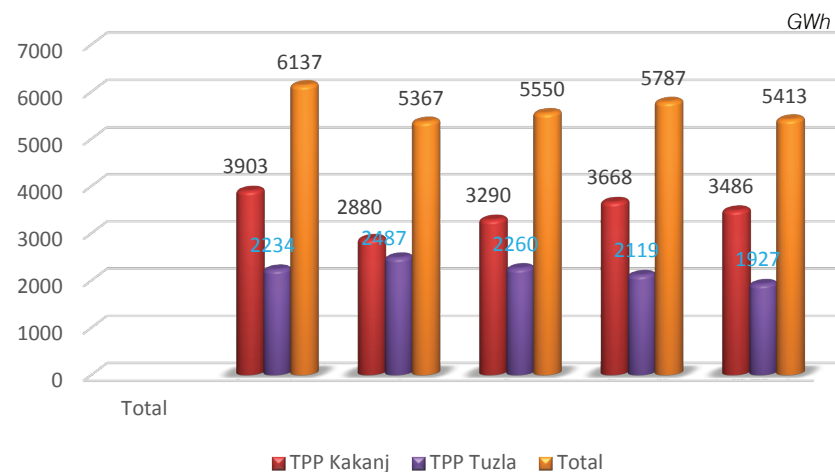
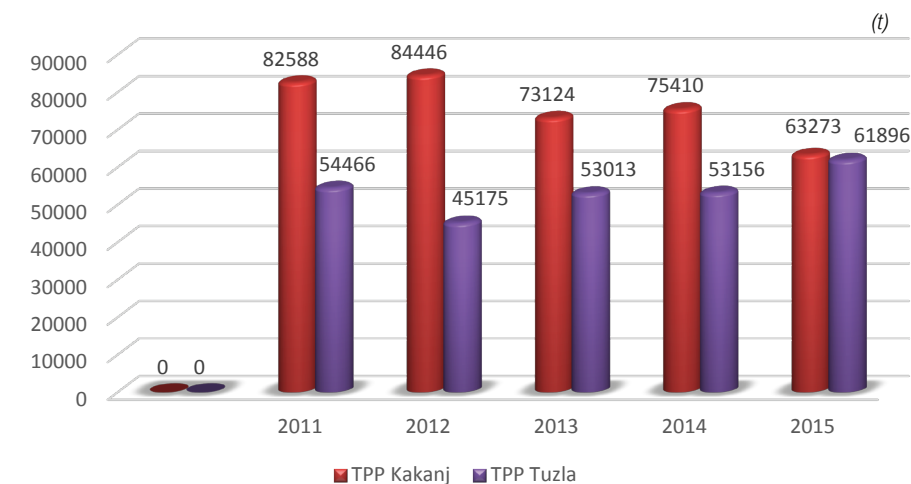


Diagram 7. Coal consumption in thermal power plants for the period 2011 – 2015



## THERMAL POWER PLANTS

Diagram 6. Electric power generation in thermal power plants for the period 2011 – 2015

Diagram 8. Emission of SO<sub>2</sub> from thermal power plants Kakanj and Tuzla for the period 2011-2015

## TREND OF ENVIRONMENTAL IMPACT INDICATORS 2011 – 2015

Diagram 9. Emissions of NO<sub>x</sub> from thermal power plants Kakanj and Tuzla for the period 2011-2015

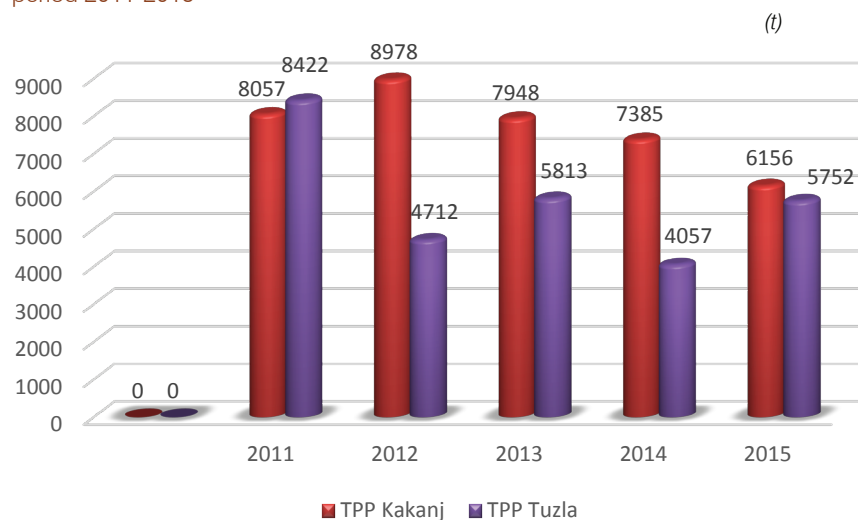


Diagram 10. Emissions of solid particles from thermal power plants Kakanj and Tuzla for the period 2011-2015

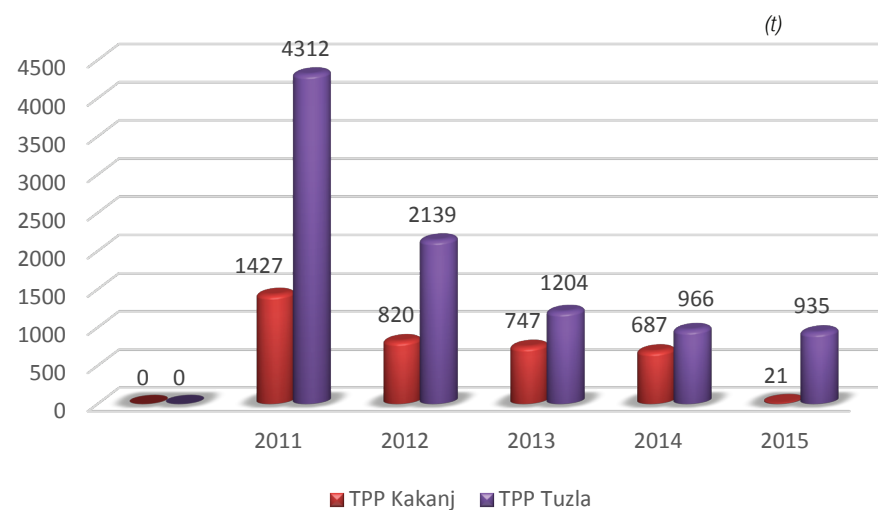


Diagram 11. Emissions of CO<sub>2</sub> from thermal power plants Kakanj and Tuzla for the period 2011-2015

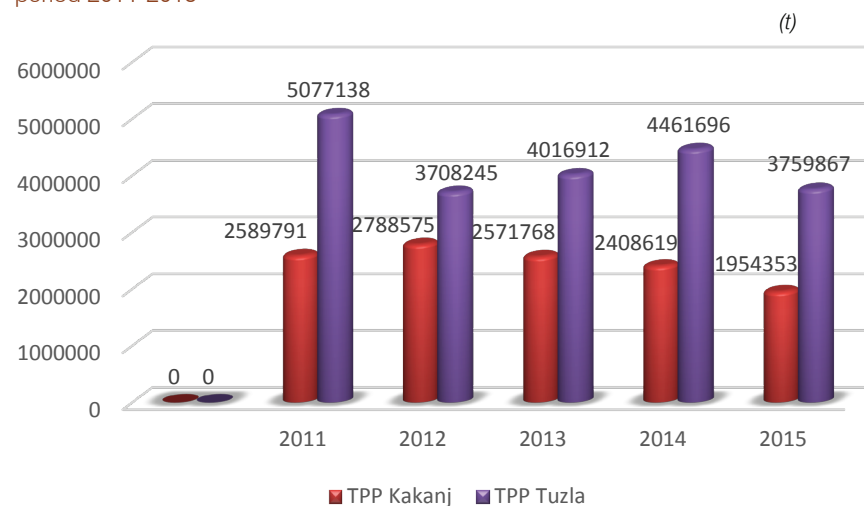
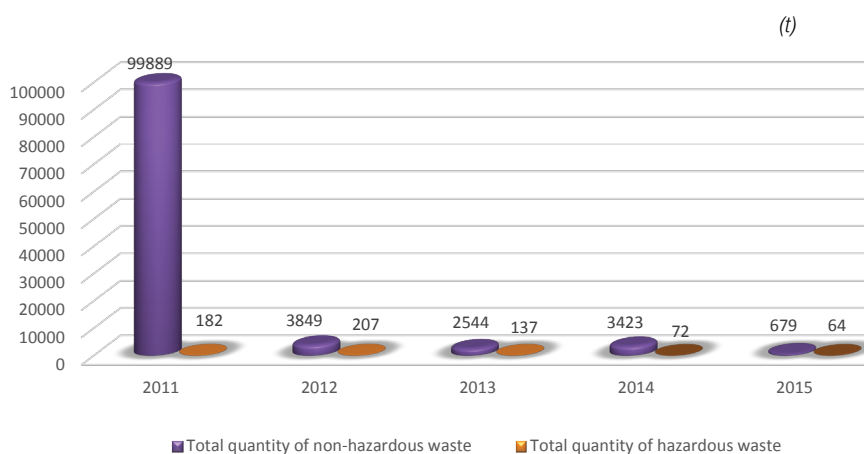
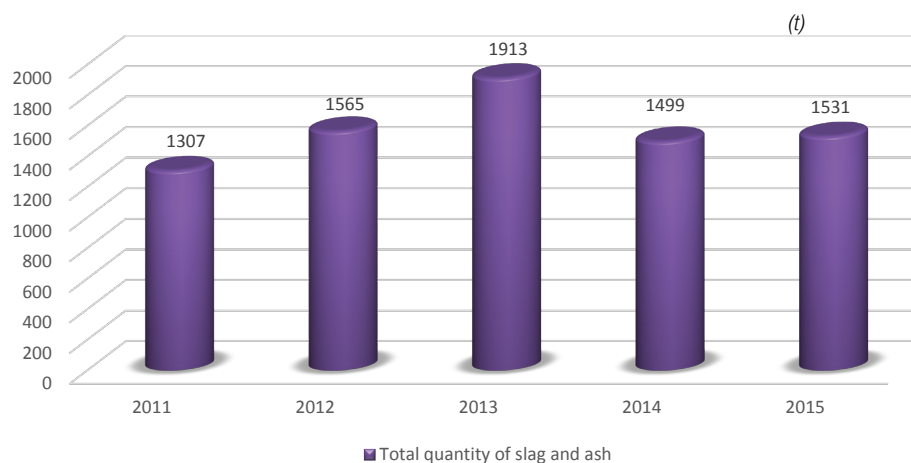


Diagram 12. Total quantity of non-hazardous waste and hazardous waste\*in thermal power plants Tuzla and Kakanj for the period 2011-2015



TREND OF ENVIRONMENTAL  
IMPACT INDICATORS 2011 – 2015

Diagram 13. Total quantities of slag and ash in thermal power plants Tuzla and Kakanj for the period 2011-2015



## HPPs ON RIVER NERETVA

Diagram 14. Electric power generation in HPPs on river Neretva for the period 2011-2015

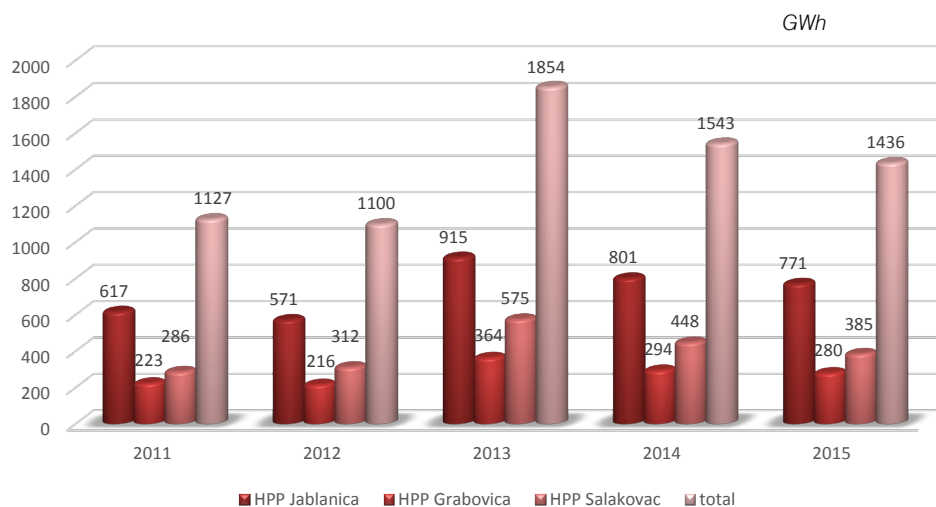


Diagram 15. Quantity of water used for electric power generation in HPPs on river Neretva for the period 2011-2015

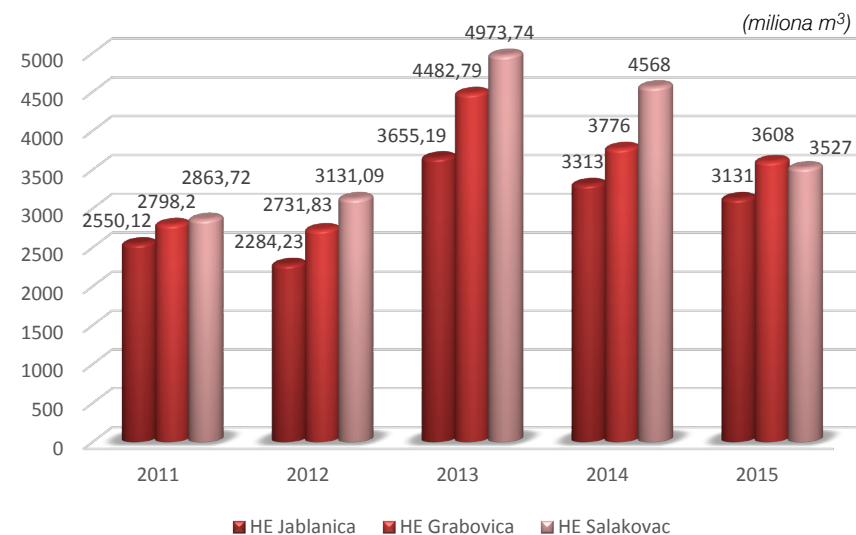
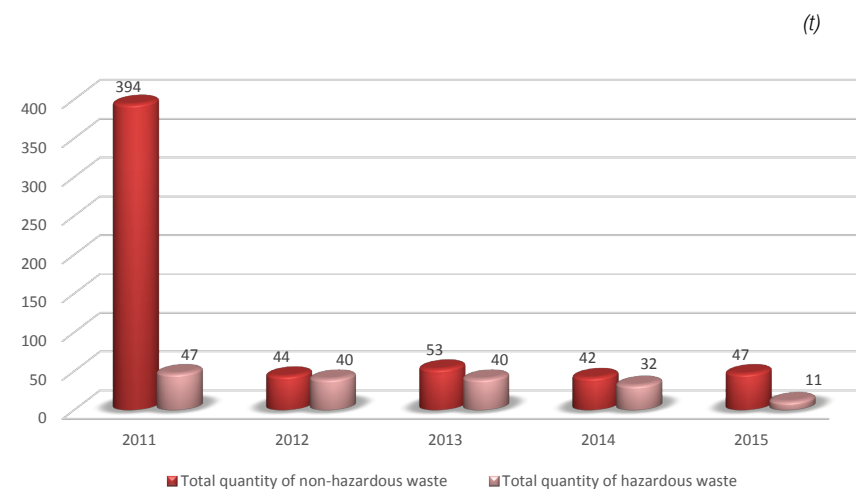


Diagram 16. Total quantity of non-hazardous waste and hazardous waste\* in HPPs on river Neretva for the period 2011-2015



TREND OF ENVIRONMENTAL  
IMPACT INDICATORS 2011 – 2015

## 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 2011-2015



## REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

### THERMAL POWER PLANTS

#### **TPP Tuzla**

##### *Building a closed system for circulating water*

- the legal requirements on the quality of wastewater discharged into natural recipient have been met,
- 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;



The project of building a closed system for circulating water was continued in 2015. The demolition of the cooling tower is part of this project. The contract was signed for works on the demolition of the cooling tower and external supervision was agreed. The deadline for completion of the contract is June 2016.

##### *Removing electrostatic precipitators of units 1 & 2*

For the Project of the removal of electrostatic precipitators of units 1 & 2, the Preliminary design of demolition of electrostatic precipitators was reviewed. Preparation of documents for getting building permit is ongoing. The Federal Ministry of Environment and Tourism issued the Environmental permit for the removal of electrostatic precipitators 1 & 2, which prescribes the measures to prevent, reduce, or if possible, remediate any significant adverse consequences.

##### *Re-cultivation of slag and ash landfill Divkovići I and II*

In the project "Re-cultivation of slag and ash landfills Divkovići I and II", a part of the technical re-cultivation of landfill Divkovići was completed, and to continue with the re-cultivation we need a Rehabilitation and Regulation Plan that is prepared by UO Service of Urban Planning, Municipality of Tuzla. The study and three surveys that will be the base for developing the Rehabilitation and Regulation Plan are being prepared. The surveys and the study were revised and submitted to the Department of Planning of the City of Tuzla, to start the drafting of Rehabilitation and Regulation Plan.

#### **TPP Kakanj**

##### *Arrangement of slag and ash landfill*

In 2015, the following activities were realized within arrangement of slag and ash landfill:

- the Main Design was prepared for extending the Landfill spray system,
- activities were completed for the expansion and rehabilitation of the existing facility for wetting the ash before disposal at the landfill

Desulphurization and denitrification of flue gases – reducing emissions of SO<sub>2</sub> and NO<sub>x</sub>

The activities on the development of investment-technical documentation for reduction of SO<sub>2</sub> and NO<sub>x</sub> emissions are ongoing.

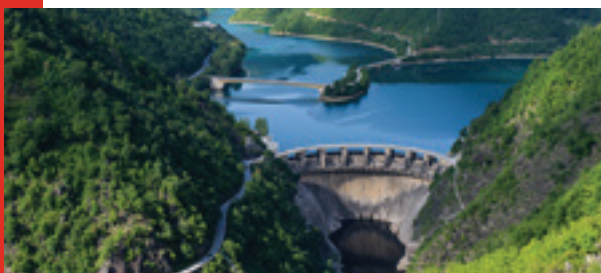
## REALIZATION OF CONDITIONS OF ENVIRONMENTAL AND WATER PERMITS

### HPPs ON RIVER NERETVA

According to the applicable environmental permits, 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.



### POWER DISTRIBUTION

#### *ED Sarajevo*

During 2015, the Request for extension of Water permit for the building of sHPP "Osanica 1" in Goražde, with the necessary technical documentation, was submitted to the Ministry of Economy of Bosnia-Podrinje Canton. The request was positively resolved and a new decision on the water permit issued, under number UP-1: 04-25-636/15 of 18/12/2015, valid for a period of five (5) years.

#### *ED Tuzla*

The subsidiary "Elektro distribucija" has applied for a new (renewed) Water and Environmental permits for the reservoir "Snježnica" in 2015.

## ENVIRONMENTAL MANAGEMENT SYSTEM

### DIRECTORATE OF THE COMPANY

The Management of the Company accepted the Report on the activities for the construction and implementation of environmental management system in compliance with ISO 14001:2004 and integration with existing management systems in the Directorate of JP Elektroprivreda BiH d.d. Sarajevo, and gave approval for the correction of the Project after the official publication of new editions of standards ISO 9001: 2015 and ISO 14001: 2015, and to harmonize the same with the requirements of these standards.



### THERMAL POWER PLANTS

#### TPP Tuzla

Certification company TÜV Thüringen conducted a re-certification audit of the Integrated Business Management System of TPP "Tuzla" in the period 30/11/2015 - 05/12/2015.

After the completion of the audit, the certification body assessed that the integrated business management system of TPP "Tuzla" is fully compliant with international standards: ISO 9001:2008 and ISO 14001:2004.

Appropriate recommendations for improvement were given in relation to standard ISO 14001:2004.

#### TPP Kakanj

An external supervisory audit of the environmental management system was executed in June 2015. 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 by the end of 2015, 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.



**HPPs on River Neretva**

The program was developed to improve the integrated management system for 2015, on the basis of which the following activities were carried out:

- The orders were carried out in terms of improving the IMS from supervisory audit of 2015,
- A review of the IMS documents was conducted on 14/10/2015,
- An internal audit was conducted in all facilities/sectors in the period 28/04-21/05/2015,
- An analysis of environmental aspects, that relate to the process of power generation in facilities/sectors was carried out in January 2015,
- In September 2015, delivered the devices and equipment for response in case of accidents, under Activities Program of the plant, and trained and educated the members of Intervention Team for preparedness and response in case of environmental hazards,
- Assessment of compliance with labour and other environmental requirements was carried out in September 2015,
- 1st supervisory audit of integrated management system in the Subsidiary HPP on river Neretva was conducted on 22/10/2015 by representatives of authorized certification body „TUV CROATIA-TUV NORD GROUP“, according to the requirements of standards EN ISO 9001:2008 i EN ISO 14001:2004.

**ED Sarajevo**

During 2015, in ED Sarajevo, working versions of the procedures and guidelines of the integrated management system were made (common requirements of ISO 14001 and OHSAS 18001) as well as for those that could not be implemented as joint quality documents.

**ED Tuzla**

Surveillance Audit for the extension of validity of the Certification of environmental management system BAS EN ISO 14001, was carried out on 31/3/2015, with the certification of the system according to ISO 9001, which together form the Integrated Management System.



## ENVIRONMENTAL PROTECTION IN SCOPE OF DEVELOPMENT OF ELECTRIC POWER FACILITIES

### THERMAL POWER PLANTS

#### TPP Tuzla

- The rehabilitation of environmental monitoring system was agreed - the emission of pollutants into the air
- The preparatory activities for the development of desulphurization plant in TPP Tuzla - the preparation of investment and technical documentation and environmental impact assessment is ongoing. The Federal Ministry of Environment and Tourism has issued the conclusion on the environmental impact assessment for the construction of flue gas desulphurization plant of Units 5 and 6.

#### TPP Kakanj

- The preparatory work for the development of desulphurization plant in TPP Kakanj- preparation of investment and technical documentation and environmental impact assessment.

#### HPPs ON RIVER NERETVA

- Procurement of devices and equipment to respond in case of an accident.
- Purchase of fish fry
- Agreements / contracts on settlement of funds intended for restocking the Neretva river basin

#### Power Distribution

As part of the electricity distribution activity, new power facilities were built, and the existing electric power facilities were reconstructed.

All of the newly built facilities (transformer substations 10(20)/0.4 kV) were built with hermetically sealed oil transformers, and under each transformer in cable substations foundations were designed to allow collection of the entire quantity of oil of power transformer (oil pan of volume of minimum 0.6 m<sup>3</sup>- oil tight), to achieve technical performance under the standards in terms of environmental protection.

Table 6. Specification of new built facilities

| Type of facility |               |     | ED<br>Bihać | ED<br>Mostar | ED<br>Sarajevo | ED<br>Tuzla | ED<br>Zenica | Σ:     |
|------------------|---------------|-----|-------------|--------------|----------------|-------------|--------------|--------|
| 110/x kV         | TS            | pcs | 0           | 0            | 0              | 0           | 0            | 0      |
| 20kV             | TS 20/0,4     | pcs | 2           | 0            | 0              | 0           | 4            | 6      |
|                  |               | kVA | 260         | 0            | 0              | 0           | 4,510        | 4,770  |
|                  | LINES         | km  | 0           | 0            | 0              | 0           | 0,153        | 0,153  |
| 35 kV            | TS 35/10(20)  | pcs | 0           | 0            | 0              | 0           | 0            | 0      |
|                  |               | kVA | 0           | 0            | 0              | 0           | 0            | 0      |
|                  | LINES         | km  | 0           | 0            | 0              | 0           | 0            | 0      |
| 10(20) kV        | TS 10(20)/0,4 | pcs | 7           | 0            | 22             | 8           | 5            | 42     |
|                  |               | kVA | 1,370       | 0            | 0              | 2,130       | 1,280        | 4,780  |
|                  | LINES         | km  | 14,39       | 0            | 34,4           | 5,06        | 10,26        | 64,11  |
| 0,4 kV           | LINES         | km  | 52,71       | 0            | 204,5          | 142,4       | 124,68       | 524,29 |
| AMM              | total         | pcs | 3,763       | 0            | 0              | 0           | 0            | 3,763  |
|                  | households    | pcs | 3,598       | 0            | 0              | 0           | 0            | 3,598  |
|                  | OP I group    | pcs | 19          | 0            | 0              | 0           | 0            | 19     |
|                  | OP II group   | pcs | 146         | 0            | 0              | 0           | 0            | 146    |
|                  | buyers 10 kV  | pcs | 0           | 0            | 0              | 0           | 0            | 0      |

ENVIRONMENTAL PROTECTION IN SCOPE OF  
DEVELOPMENT OF ELECTRIC POWER FACILITIES

Table 7. Connecting the new facilities to the electricity grid

| NEW FACILITIES               |                                            | Unit of meas-ure | ED Bihać | ED Mostar | ED Sarajevo | ED Tuzla | ED Zenica | Σ:    |
|------------------------------|--------------------------------------------|------------------|----------|-----------|-------------|----------|-----------|-------|
| LV connec-tions based on EES |                                            | pcs              | 0        | 0         | 4,804       | 2,182    | 1,961     | 8,947 |
| 0,4 kv                       | Number of derived new con-nections (total) |                  | 1,602    | 0         | 0           | 0        | 0         | 1,602 |
| 0,4 kv                       | Households (one-phase connection)          |                  | 868      | 0         | 0           | 0        | 0         | 868   |
|                              | Households (three-phase connection)        |                  | 400      | 0         | 0           | 0        | 0         | 400   |

Table 8. Specification of reconstructed facilities

| Type of facilities |            |     | ED Bihać | ED Mostar | ED Sarajevo | ED Tuzla | ED Zenica | Σ:      |
|--------------------|------------|-----|----------|-----------|-------------|----------|-----------|---------|
| 35 kV              | TS         | pcs | 3        | 0         | 0           | 1        | 0         | 4       |
|                    | 35/10(20)  | kVA | 0        | 0         | 0           | 0        | 0         | 0       |
|                    | LINES      | km  | 0        | 10.828    | 0           | 1.3      | 0         | 12.128  |
| 10(20) kV          | TS         | pcs | 1        | 7         | 4           | 6        | 14        | 32      |
|                    | 10(20)/0,4 | kVA | 0        | 4,090     | 0           | 0        | 1,470     | 5,560   |
|                    | LINES      | km  | 5.11     | 19.473    | 15.641      | 6.68     | 6.96      | 53.864  |
| 0,4 kV             | LINES      | km  | 6.53     | 0         | 35.695      | 61       | 44.86     | 148.085 |
|                    | OMM***     | pcs | 6,025    | 0         | 12,757      | 5,722    | 5,242     | 29,746  |

OMM\*\*\* means metering points



## CAPITAL INVESTMENTS

### ***Unit 7 - 450 MW in TPP Tuzla***

In 2015, the activities were continued on the implementation of the Contract on the construction of Unit 7 - 450 MW in TPP Tuzla. Also, negotiations were held with representatives of the Chinese partner and the Chinese Exim Bank in order to create preconditions to accept the loan by the institutions of the FBiH and to create preconditions to sign the Contract on the project cooperation, by which the Contract for the construction of Unit 7-450 MW in TPP Tuzla would come into force.

1. Activities in 2015:
  - Completed optimization / modification of completed and revised projects for carrying out preparatory work at the site of Unit 7.
  - Completed geological, geotechnical, geophysical and seismic exploration works for Unit 7 of TPP Tuzla to the level of the main design.
  - During 2015 the competitive procedure completed for complete expropriation of property for the purpose of building the Unit 7 and the procedure of expropriation of undeveloped city construction land, for the purpose of bringing it to its end-use and allocation for the use of urban construction land, by direct agreement for the construction of Unit 7 TPP Tuzla.

### ***Unit 8 - 300 MW in TPP Kakanj***

In 2015, we obtained Water permit issued by the „Agency for the Sava river basin“ Sarajevo.

The Municipality Kakanj and JP Elektroprivreda BiH have implemented the Agreement on implementation of the Program for the friendly environment for the construction of Unit 8 in TPP Kakanj, with established projects and approved funds for implementation of projects.

### ***Hydro power plant Janjići***

In 2015 we completed the Preliminary Design of HPP Janjići. The Baseline survey of flora and fauna was completed in October 2015. The Environmental and Social Impact assessment study was completed and submitted to the Federal Ministry of Environment and Tourism in October 2015. During 2016 we expect the assessment by the expert commission, the completion of the process and obtaining the Environmental permit.

### ***Other activities related to HPP Janjići:***

- Constant observation of piezometric wells executed and geological exploration carried out for HPP Janjići
- Constant observation of the water levels of the river Bosna on the set
- automatic hydro-station, downstream of the planned dam of HPP Janjići.

### ***HPP Una Kostela and Annex on the river***

In 2015 activities were continued on preparation of the Preliminary design for reconstruction and expansion of HPP Una Kostela.

The Preliminary design for reconstruction and expansion of HPP Una Kostela was reviewed.

The Study with research for environmental flow (EF) - Qepp on the profile of HPP Una Kostela: For the existing HPP Una Kostela a new Decision on the water permit was obtained, which, in accordance with the Ordinance on the calculation of environmental flow (EF) requires calculation of new features of EF. Calculation of production of the power plant established the damage caused by the application of this Ordinance. As the value of the EF has a significant impact on new plant and selection of basic parameters of the same, we started the development of the Study with research works on environmental flow of the river Una on the profile of HPP Una Kostela, in accordance with the Water Law, the articles of the said Ordinance which establish a framework to determine the EF on heavily modified water bodies and the EU Water Directives.

The preparation of the Environmental and Society Impact Assessment of the hydro power plant Una Kostela and the Study with research works on environmental flow of the river Una on the profile of HPP Una Kostela is ongoing,

### ***HPP Babino selo***

The Contract for the Environmental Impact Assessment for HPP Babino Selo was signed in 2015.

### ***HPP Kovanići on river Bosna***

Feasibility study which includes geological exploration and a preliminary environmental impact assessment was prepared in 2015.

Preparation of the Feasibility study with geological exploration and a preliminary environmental impact assessment. As part of the initial field research, within the initial field research the consultant who prepared the Study, in his first report informed that the first planned backwater of 268 m above sea level, due to the dumping or compromising of 48 houses is not feasible from the environmental aspect. In addition to houses, this angle would threaten the infrastructural facilities (trunk road M17 and the bridge on the railway line Šamac - Sarajevo). The backwater of 263.5 m asl was adopted, and according to preliminary environment impact assessment, this is acceptable from the environmental aspect.

### ***Wind Farm Podveležje***

The Baseline Study of birds and bats at the project site of the Wind Farm Podveležje was completed in 2015.

## PREPARATION OF PLANNING AND STUDY DOCUMENTS



As a Party of the Energy Community, Bosnia and Herzegovina was obliged to deliver to the Secretariat of EnC the National emission reduction plan (so-called NERP). The plan was made on the basis of the program for reducing pollutants of operators of existing thermal units (JP Elektroprivreda BiH, NATRON HAYAT and Elektroprivreda RS). The deadline for submission of the same was 31/12/2015. Preparation of the NERP was run by USAID EIA project with the coordination of the Ministry of Foreign Trade and Economic Relations, with the active participation of the Working Group of JP Elektroprivreda BiH. The NERP was completed, adopted by the BiH Council of Ministers, and timely submitted to the Secretariat of EnZ.

Analysis and testing of potential benefits by integration of smart electricity meters in the of distribution networks management systems.

Using of wind potential to produce electricity on mountains Vlašić and Travnik.

Study of utilization of wind potential at the site Bitovnja, Konjic.

Study of the possibility of using waste wood and agricultural biomass in thermal power plants of JP Elektroprivreda BiH.

Project: Campaign of measurements of wind and solar energy potential.

### ***HPPs on the River Neretva***

HPP on Neretva, with the Contract no. HEN-091/15 of 29/09/2015 with the Faculty of Natural Sciences and Mathematics in Sarajevo, signed the creation of the program to revitalize the fish communities in the Neretva river basin.

## FINANCIAL INVESTMENTS

For now, JP Elektroprivreda BiH does not keep separate records on investments and costs for the implementation of plans and programs in the field of protection of environment and natural resources. The funds are planned and implemented in the framework of investment and regular maintenance of plants and facilities. There is no harmonized procedure of presenting objective indicators of total financial investment in realized activities, which includes fees for the use of natural resources. Therefore, it is difficult to provide secure and comprehensive data on total funds spent by JP Elektroprivreda BiH in this context. According to the data available for the preparation of this document, the total amount is 44,103,581 KM. This indicator is a confirmation that environmental protection is an important part of the total business also in financial aspect. The following table, 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.

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

| Organization                                                                               | ( KM )            |
|--------------------------------------------------------------------------------------------|-------------------|
| <b>Subsidiaries</b>                                                                        |                   |
| TPP Tuzla                                                                                  | 3,054,593         |
| TPP Kakanj                                                                                 | 4,606,099         |
| HPP on River Neretva                                                                       | 1,872,028         |
| ED Sarajevo                                                                                | 31,707            |
| ED Tuzla                                                                                   | 646,453           |
| ED Zenica                                                                                  | 1,637,257         |
| ED Bihać                                                                                   | 308,473           |
| ED Mostar                                                                                  | 196,528           |
|                                                                                            |                   |
| Fee for air pollution of TPP Tuzla                                                         | 2,279,257         |
| Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP | 5,247,119         |
| Fee for water protection                                                                   | 1,042,710         |
| Fee for air pollution of TPP Kakanj                                                        | 2,628,425         |
| Fee pursuant to the Law on the allocation of part of the revenues generated by work of TPP | 2,890,610         |
| Fee for water protection                                                                   | 446,909           |
| Contributions for hydro reservoir (HPP on river Neretva)                                   | 14,362,808        |
|                                                                                            |                   |
| <b>Company Directorate</b>                                                                 |                   |
| Sector for strategic development                                                           | 699,295.04        |
| Capital investments                                                                        | 2,111,564.80      |
| Water charges and communal utilities                                                       | 41,745.01         |
| <b>TOTAL:</b>                                                                              | <b>44,103,581</b> |

