

**ELECTRIC POWER INDUSTRY OF SERBIA**  
ANNUAL REPORT 2015



# Mission

Electric Power Industry of Serbia mission is secure electricity supply to all customers, under the most favourable market conditions, with continuous upgrading of the services, improvement of environmental protection and welfare of the community.



# Vision

Electric Power Industry of Serbia vision is socially responsible, market-oriented and profitable company, competitive on the European market with a major impact in the region, recognized as a reliable partner among the local and international companies.



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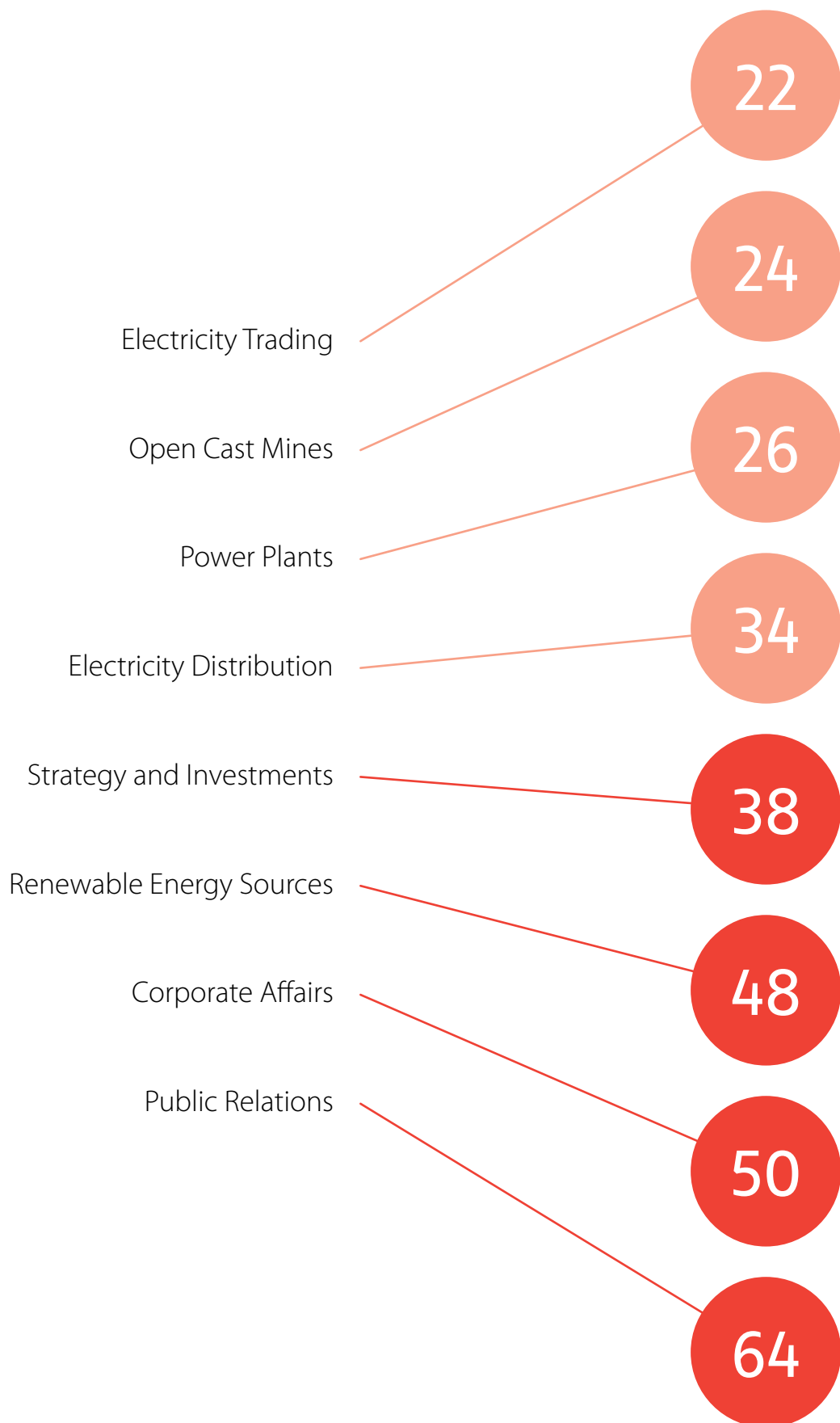
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## Milorad Grčić

### Acting Director

At the time of my appointment to the position of Acting Director of the Electric Power Industry of Serbia in March 2016, I made a promise to do my best and make our company's employees my number one priority. Our main target is a profitable and stable EPS, owing its profitability and stability to its people.

EPS should project an image of quality of its employees, which means that it should be professional, energetic and efficient. During the previous months, quite a lot has been done to improve working conditions, professional development opportunities and meet all preconditions allowing us to be ultimately satisfied with the work we do. This still remains our principal task.

As far as the company's activities in 2015 are concerned, I may speak mostly from the perspective of the Kolubara Mining Basin operations, since I was heading it from 2012. We were all trying to pull our own weight to make changes happen in EPS and they still continue to happen. In my opinion this is our obligation, as we represent the largest company in Serbia and the mainstay of local economy and society. This is the only way for us to be competitive in the large and open market.

Despite the previously planned losses of RSD 21.5 billion, the fact that our profit in 2015 was RSD 10 billion best indicates that we are on the right track. EPS contributed RSD 65 billion to the budget of the Republic of Serbia, through taxes, levies and fees. Each employee of our company should be proud and aware of the fact that individual contribution is essential.

It is also important that every employee wants us to achieve even more.

Formation of the Board of Executive Directors demonstrates that management improvements are one of our priorities, enabling efficient vertical management. This implies easier organization and perceiving all advantages and room for progress in each area, as well as transparency and responsibility.

EPS reorganization and status change resulted in the acquisition of seven former subsidiaries for electricity and coal production by the parent company - PE EPS. At the same time, electricity and coal production were integrated with electricity trade, facilitating much better planning which is the best way to make savings throughout the entire system. On the other hand, former five subsidiaries for electricity distribution were merged into a new Distribution System Operator - EPS Distribution. This is targeted at having uniform and integrated distribution processes, providing the same service level to all customers in Serbia and equal conditions for all suppliers connected to the distribution network.

Of equal importance is that as of April 02<sup>st</sup>, 2015, direct power exchange trading without intermediaries began for the first time in the Serbian power industry history. Here, also, we managed to meet expectations, given the achieved revenue of EUR 8.7 million.

We all know that the coal miners' job is extremely difficult. My experience in Kolubara is abundant with difficult situations, caused by adverse weather conditions that hit both our country and mines. Therefore, achieving the planned coal production level in 2015 is great success, while compared with the previous year, the results are impressive. Coal production plan was exceeded by 15 percent at the Tamnava-West Field Open Cast Mine. This mine suffered the most during the May 2014 floods. Water from the mine was pumped out in record time, in full compliance with safety, occupational health and safety and environmental measures. Flood recovery was also continued in 2015 at the Drmno Open Cast Mine in Kostolac through enormous efforts and dedication of its employees. Operational teams, using the company's own technology and machinery, cleared the flooded equipment from large amounts of silt, which was revitalized and recommissioned within the shortest possible period.

However, we did not stop there and allowed the miners' efforts to be wasted. Achieved electricity generation levels were the fifth highest in the past 15 years. Projects involving revitalization and construc-

tion of new generation capacities were continued. The most important project not only for EPS but for the entire Serbian economy is definitely the construction of a third 350 MW unit at the Kostolac B Thermal Power Plant. Furthermore, according to plans, annual production at the Drmno mine will be increased from nine to 12 million tons. There is also the Kolubara Mining Basin Environmental Improvement Project introducing the coal quality management system and aiding modernization of mining equipment.

Solid planning and meeting of targeted objectives also marked the distributor's operations. Fight against electricity losses was continued. Yet what is important is that we gained considerable experience in our fight against unauthorized electricity consumption. There is full cooperation and mutual learning between our teams. Therefore, I am certain that we will put an end to this occurrence hardly seen in Europe. Intensive reconstruction of network and various facilities on all voltage levels was carried out and it will certainly be continued in the future.

All this goes to show that employees are the greatest value of the Electric Power Industry of Serbia. In 2015, a project enabling us to develop occupational health and safety management tools used by the managers was implemented. Plans were made to apply these tools throughout entire system of the Electric Power Industry of Serbia by exchanging skills and experience. When it comes to safety issues, special attention has been paid to the production workers, the ones working day and night on our coal mines, ensuring stable power plant operation; our electricians maintaining the distribution network during rain, wind and snow so that all people in Serbia have electricity in their homes.

Electric Power Industry of Serbia welcomed 2016 with a clear vision of future. Past changes were historical and extensive; however, they are not over yet. A lot still has to be done. Nonetheless, I am certain that united we will succeed, together with the support of the Serbian Government and the line ministry. We all know what it takes to create, maintain and bring further improvements to an economic giant our company without a doubt is.





## Branko Kovačević, PhD

### Chairman of Supervisory Board

2015 was a crucial year for the development of Electric Power Industry of Serbia. Fundamental reforms have been initiated and EPS is heading towards profitable, efficient and stable power utility. Formal changes in reorganization of the company were conducted and management system was improved. Status changes as of July 01<sup>st</sup> have been the largest organizational changes in this company for the last twenty years.

The reform of the largest company in the country was simultaneously supported by the Government of the Republic of Serbia, Ministry of Mining and Energy, Supervisory Board and EPS management. EPS also had full support for the status change from all state bodies and institutions. Competent ministries, Business Registers Agency, Tax Administration, Pension

and Disability Insurance Fund and many others were involved. Special credit goes to EPS employees, operational teams and professional services of the entire EPS Group. Initiatives were started and relevant documents were adopted, and Electric Power Industry of Serbia showed again that it has sufficient number of experts who have completed extensive reorganization assignment in an operational manner.

At the beginning of 2015 the Supervisory Board appointed Board of Executive Directors, who became responsible for vertical operation of certain activities in EPS. That enabled EPS to become process driven company.

Mid-April the Supervisory Board adopted the decision on initiation of the status change process by ac-



quisition of seven subsidiaries for electricity and coal production to the parent company - PE EPS, and acquisition of five subsidiaries for electricity distribution to Distribution System Operator - EPS Distribution.

As of July 01<sup>st</sup>, 2015, EPS operates as a one company and in that sense EPS made more progress in reforming than any other public enterprise.

The Supervisory Board approved long-term loan in the amount of 608 million dollars for the implementation of phase II of package project TPP Kostolac B. The project foresees the construction of unit B3 in TPP Kostolac B of 350 MW capacity and extension of Drmino Open Cast Mine from nine to 12 million tons of coal. That will be the first large energy facility constructed after three decades. The project is a part of state arrangement between the People's Republic of China and the Republic of Serbia and it is certainly one of the largest in the country. It employs hundreds of workers and companies from Serbia, in addition to those engaged by the Chinese partner. Within phase I of the package both units in TPP Kostolac B were revitalized, flue gas desulphurization plant was constructed, and the activities on the construction of railway line from Stig to thermal power plant and dock on Danube River were initiated. EPS once again confirmed that it is a driving force of Serbian economy and important participant in reindustrialization process of the country. Because EPS can and should be the pillar of the new industry of Serbia.

Environmental projects related to coal and ash, coal dust, waste water and carbon-dioxide are being implemented in Kostolac. Domestic scientists are finding the solutions to create products useful for other industries through the processing of those hazardous substances, created as the result of power plants operation.

That is the beginning of the sustainable development problem solving, which includes environmental protection, energy efficiency and recycling that are popular topics both in Serbia and worldwide. Kostolac will be one of the experimental bases and together with Kolubara and TENT it will remain the generator of the Serbian economy development.

The development of the economy is one of the ways to solve the problem of unemployment as well. Therefore, it is important to cooperate with the local self-government, state, and primarily our companies. We have to focus on the new technologies. Serbia cannot just sell cheap work force but it also has to sell the "brain power" which is the most expensive.

Electric Power Industry of Serbia and six faculties of the Belgrade University have entered into cooperation agreements that will enable internship in EPS for the best students giving them the opportunity for employment with the largest company in Serbia. EPS is an "old" company since the average age of its labor is about 50 and this is why it has to start recruiting young technicians, mechanical and electrical engineers, and technologists, but also lawyers, economists and managers. Electric Power Industry of Serbia lacks young experts that will mature in 10 to 15 years and become the pillar of new top and middle management. Student Internship Program has started cooperation with technical faculties and the best students from School of Electrical Engineering, Faculty of Mechanical Engineering and Faculty of Mining and Geology can have their internship in EPS.

In 2015 as well, EPS employees faced the consequences of May floods from the previous year. Only through their dedication all flood consequences have been eliminated, and all production capacities were brought into the state as before the floods.

As a socially responsible company, Electric Power Industry of Serbia has supported numerous projects, institutions and associations in all areas of life. EPS has provided assistance to individuals in their treatment and procurement of medicines, and to hospitals and clinics to improve their working conditions. EPS traditionally supports professional organizations and events such as Association of Energy Sector Specialists, CIGRE, CIRED... We have helped many schools and faculties, enabled students to visit TENT, Kolubara and Djerdap with their professors and see everything they have been studying about. Traditionally, EPS is always supporting Serbian national teams and athletes. In 2015 as in every previous year, Electric Power Industry of Serbia supported humanitarian projects, culture and religious institutions.



# Company Data

## Name of the company

Public Enterprise Electric Power Industry of Serbia Belgrade (PE EPS Belgrade)

## Head Office

11 000 Belgrade, 2 Carice Milice St

## Phone

+381 11 20 24 600, +381 11 20 24 800

## Email, website

pr@eps.rs, www.eps.rs

## Registration

Decision BD 80380/2005 Serbian Business Registers Agency

## Registration number

20053658

## TIN

103920327

## Establishment

Public Enterprise Electric Power Industry of Serbia was established

July 01<sup>st</sup> 2005 by the Government of the Republic of Serbia

## Organizational Structure

Vertically organized and parent-control company which have founding rights in two subsidiaries-controlled companies and three public enterprises in Kosovo and Metohija. Since June 1999, EPS has not been in the position to operate its capacities in Kosovo and Metohija.

Electric Power Industry of Serbia is the founder of Distribution System Operator - EPS Distribution, LLC, Belgrade and subsidiary EPS Trading, LLC, Ljubljana. Pursuant to Article 551 of the Company Law, they all together make a group of companies linked by the capital.

Up to July 01<sup>st</sup>, 2015, PE EPS has operated through its 13 subsidiaries, and after implementation of status changes, acquisition of 11 subsidiaries to the parent-control company was finalized.

As a founder, PE EPS has significant share in subsidiaries:

- Company for combined generation of thermo-electric and heating energy, Energija Novi Sad, JSC, Novi Sad, founded with the City of Novi Sad, in the amount of 50 percent of shares in the Company's equity;
- Company Ibarske Hydro Power Plants, LLC, Kraljevo, founded with Seci Energia S.p.A, Italy, with 49 percent of shares in the Company's equity;
- Company Moravske Hydro Power Plants, LLC, Belgrade, founded with RWE Innogy, Germany, with 49 percent of shares in the Company's equity.

## Ownership Structure

100 percent owned by the Republic of Serbia.



## Bodies of the Company

In accordance with regulations, Decision on Harmonization of Business Operations of Public Enterprise for Electricity Generation, Distribution and Trading with the Law on Public Enterprises (Official Gazette of the Republic of Serbia, No 50/2013) and the Statute of the Public Enterprise Electric Power Industry of Serbia (PE EPS No 192621/30-16, dated May 25<sup>th</sup>, 2016): Supervisory Board, Executive Board and Director.

Supervisory Board and Director are appointed by the Government of the Republic of Serbia, and Executive Board, comprised of Executive Directors, is appointed by the Supervisory Board, at the proposal of Director. Director holds the position of the Chairman of Executive Board.

PE EPS has Audit Committee as a separate body with rights and obligations determined by the Law and acts of Public Enterprise, performing the tasks for EPS Group.

## Activities

Prevailing activity of the Public Enterprise Electric Power Industry of Serbia is energy activity of electricity supply (activity code 35.14 – electricity trading).

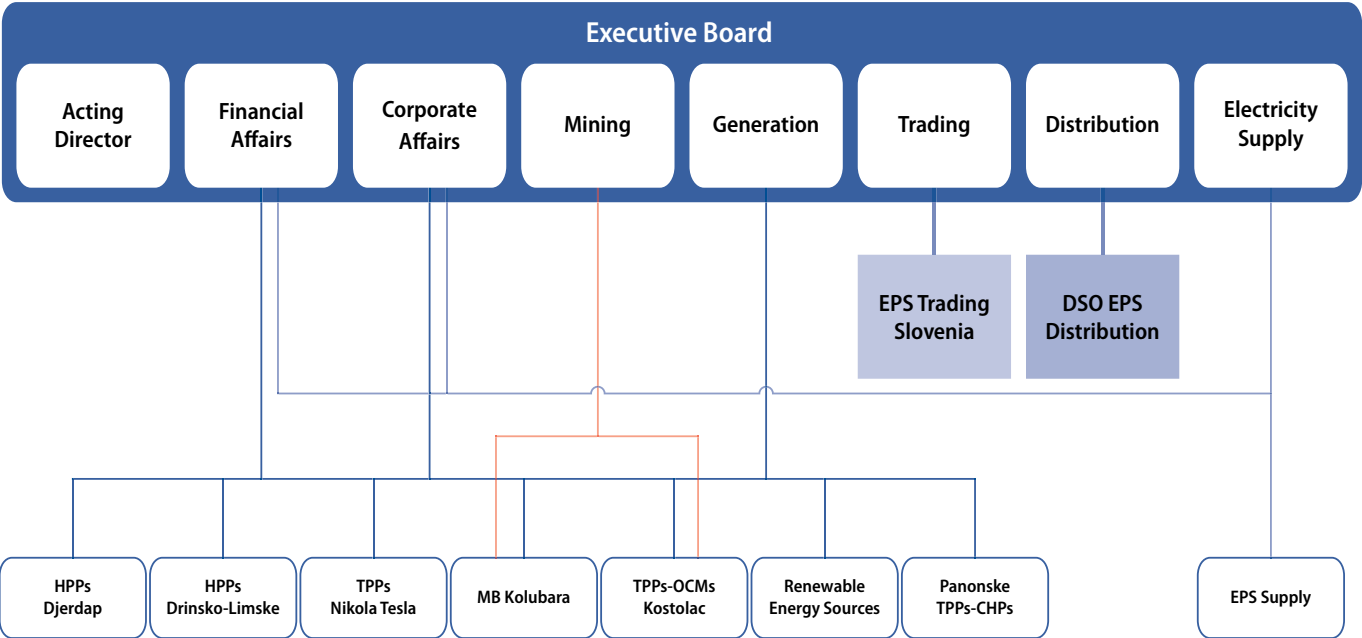
Public Enterprise performs also the following activities:

- Coal production;
- Generation of electricity and heating energy;
- Electricity distribution and distribution system management;
- Business entity management;
- Cable telecommunications.

The above activities are performed by PE EPS directly or through subsidiaries, with the activity of business entity management performed only by the Public Enterprise as a parent-control company.

# Organizational Chart

## PE EPS



# Major Events

## JANUARY

- Since January 01<sup>st</sup>, opened market for customers of category “households”.
- The Government of the Republic of Serbia gave consent on PE EPS Statute amendments, creating conditions for EPS reorganization.
- Supervisory Board of PE EPS appointed members of EPS Executive directors Board.
- The National Assembly of the Republic of Serbia ratified the loan agreement for the third unit construction in TPP Kostolac B and extension of open-cast mine Drmno.

## FEBRUARY

- Completed revitalization of Unit A3 in TENT A. Power of unit is increased by 23 MW.

## MARCH

- Heavy snow and strong winds affected the area of subsidiaries Elektrosrbija and Jugoistok. Assembling teams were around the clock at site.
- Improvement project on management of safety and health at work PE EPS, in TPPs-OCMs Kostolac and Jugoistok was initiated.

## APRIL

- Through subsidiary EPS Trading in Slovenia, PE EPS began electricity trading on Hungarian Power Exchange HUPX, directly and without intermediary, for the first time in history.
- Supervisory Board of PE EPS made decision on PE EPS status change initiation.
- Revitalized unit A5 in HPP Djerdap 1 was put into operation. The unit’s power is increased by 15 MW.

## MAY

- During company corporatization new systematization was applied and it reduced the number of departments and directors’ positions in PE EPS.
- TPPs-OCMs Kostolac got the first license for performing activities of port operator in the Republic of Serbia, which will enable dock Kostolac construction as a part of construction of the third unit in TPP Kostolac B project.

## JUNE

- The dam on the Kolubara River was built, which will provide additional protection of open cast mines from flood waves and torrential layers.

## JULY

- By merger of seven subsidiaries for generation of electricity and coal production to the parent company PE EPS and by merger five subsidiaries for electricity distribution to the subsidiary Distribution System Operator - EPS Distribution, the first phase of EPS’ reorganization has been terminated.

## AUGUST

- On the open cast mine Tamnava-West Field, the third system for mullock detection has been launched, providing capacity before floods.
- In TPPs-OCMs Kostolac, construction of railroad from the train station Stig up to thermal power plant Kostolac B has been launched.
- At the location of TENT A, construction of plant for waste water treatment has started.
- Revitalization of unit A1 in HPP Djerdap 1 has begun.

## SEPTEMBER

- The Government of the Republic of Serbia gave consent to the founding of subsidiary Elektro-sever in Severna Mitrovica, in accordance with the provisions of the Energy agreement within Brussels process.

## OCTOBER

- Revitalization of the unit A1 in HPP Zvornik has started.
- PE EPS and ABB have signed contract on procurement of hardware and software for the coal quality management system on open-cast mine Tamnava-West field.

## NOVEMBER

- Within the project Thermal power plant Kostolac B, construction of chimney within construction of the flue gas desulphurization plant is completed.

## DECEMBER

- MB Kolubara fulfilled annual production plan of 28.2 million tons of coal, four days before the end of 2015.
- PE EPS and six faculties of the University of Belgrade have signed agreement on cooperation which will enable practice in EPS for the best students.

# EPS in Figures

Data related to capacities managed by  
Public Enterprise Electric Power Industry of Serbia

## GENERATION CAPACITIES

Net output capacity

**7,304\*** MW

## ELECTRICITY GENERATION

**35,661** GWh

## COAL PRODUCTION

**37,029,091** t

## OVERBURDEN REMOVAL

**84,195,353** bcm

## SALE

In EPS Group

**33,729** GWh

## SALE

Out of EPS Group

**2,957** GWh

## TOTAL SALE

**36,686** GWh

## PURCHASE

Out of EPS Group

**1,042** GWh

## NUMBER OF CUSTOMERS

Total

**3,422,387**

Guaranteed supply

**3,410,368**

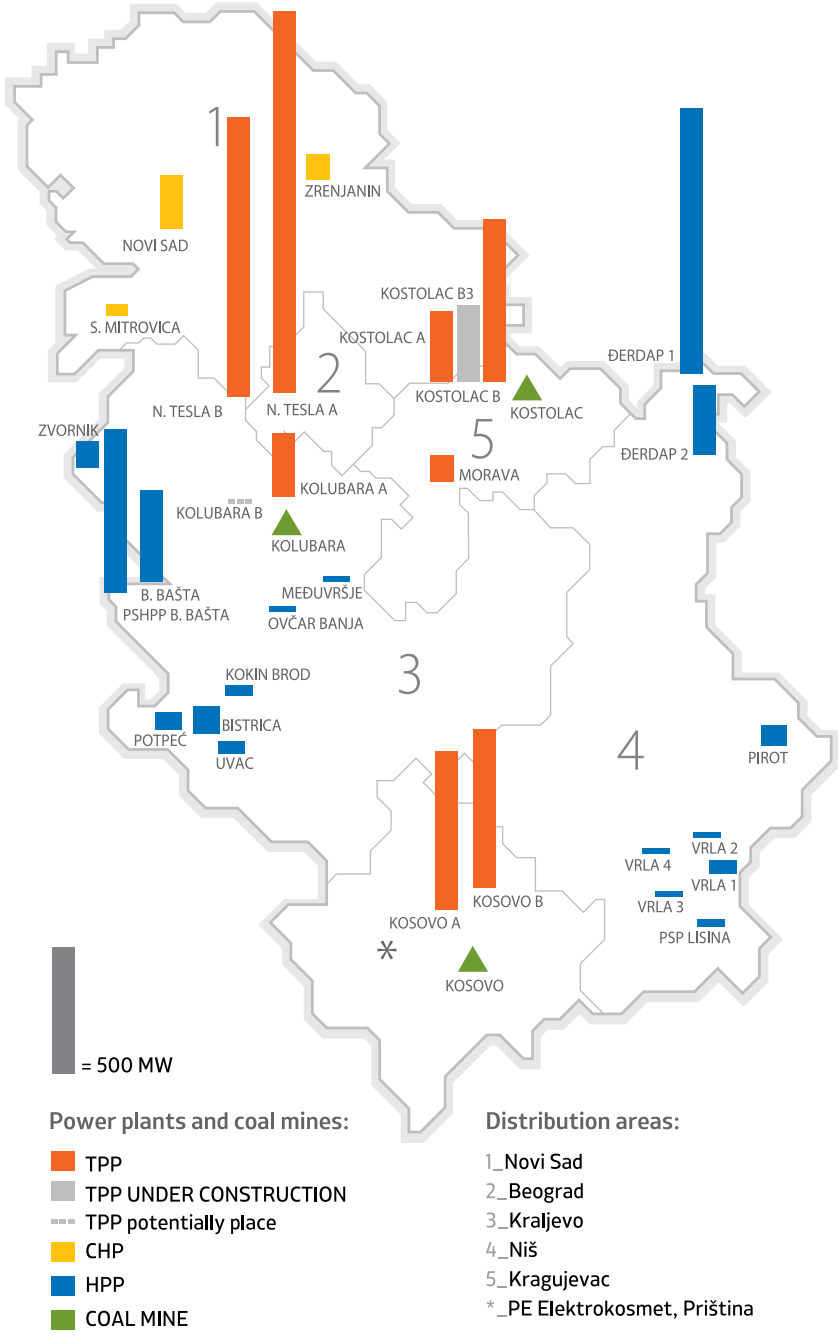
Last resort supply

**719**

Commercial supply

**11,300**

# EPS Installed Capacities



# Economic and Financial Affairs

The analysis of realized financial result of Electric Power Industry of Serbia in 2015 was conducted by analyzing realized financial results and comparing them to the planned and realized results for the same period of the previous year.

The positive financial result of 9.5 billion dinars, i.e. net profit of seven billion dinars is given in the consolidated financial statement of EPS Group for the period January-December 2015.

Elements		Actual I-XII 2015	Plan I-XII 2015*	Actual I-XII 2014	Index (2/3) (2/4)	
1		2	3	4	5	6
I	Operating revenues	225,063,985	223,178,539	212,091,829	101	106
II	Operating expenditures	192,419,226	232,717,529	187,259,531	83	103
I-II	Operating profit/loss	32,644,759	-9,538,990	24,832,298	0	131

III	Financial revenues	14,901,309	15,258,959	15,727,148	98	95
IV	Financial expenditures	12,333,736	14,729,584	14,418,156	84	86
III-IV	Financial profit/loss	2,567,573	529,375	1,308,992	485	196

V	Other revenues	6,017,842	2,115,814	6,186,698	284	97
VI	Other expenditures	31,698,639	28,450,758	41,176,052	111	77
V-VI	Other profit/loss	-25,680,797	-26,334,944	-34,989,354	0	0

A	Total revenues (I+III+V)	245,983,136	240,553,312	234,005,675	102	105
B	Total expenditures (II+IV+VI)	236,451,601	275,897,871	242,853,739	86	97
A-B	Total profit/loss	9,531,535	-35,344,559	-8,848,064	0	0
	Tax expenditures	-4,865,567	0	-3,213,269	0	0
	Deffered tax revenues/expenditures	2,320,376	0	2,269,355	0	102
	<b>Net total profit/loss</b>	<b>6,986,344</b>	<b>-35,344,559</b>	<b>-9,791,978</b>	<b>0</b>	<b>0</b>

\*Annual Business Plan after the status change 01.07.2015.



#### REALIZED RESULTS (in billion dinars)

**32.6** positive from business operation

**2.6** positive from financial activities

**25.7** negative from other business activities

#### KPI - KEY PERFORMANCE INDICATORS (in billion dinars)

**9.5** EBT (total financial result before tax)

**32.6** EBIT (result from business operation)

**72.2** EBITDA

**46.6** EBITDA 2

**7** net total financial result

**139.7** total financial debt

**93.8** net debt

#### EPS GROUP ASSETS on 31.12. 2015. (in billion dinars)

**957.7** net value of non-current assets

**1,091.1** total value of commercial property (share of non-current assets is prevailing with 87.7 percent)

#### TOTAL LIABILITIES AND LONG-TERM PROVISIONS on 31.12. 2015. (in billion dinars)

**122.8** cumulative loss

**222.4** total liabilities and long-term provisions

**180.2** receivables from sale (gross)

## The factors that affected economic and financial status

- **Electricity price** Achieved level of electricity price for guaranteed supply after price increase by 4.5 percent as of August 01<sup>st</sup>, 2015, amounted to 6.885 RSD/kWh. Long-term policy of non-economic electricity price leads to extremely high specific electricity consumption per domestic product and irrational share of this expensive type of energy for the purpose of meeting the demands of total final energy consumption in Serbia. Electricity price for the guaranteed supply in the Republic of Serbia is significantly lower compared to the prices in the region and Europe. This resulted in lack of investment into new capacities, lack of funds for maintenance of old facilities, increase of inefficient electricity use (particularly for heating purposes) and increase of debts for covering service provision costs;
- **Payment conditions** EPS gives five percent discount for bill payment until due date;
- **Distribution network losses** Due to the limited investments, technical and non-technical losses are significantly above optimum level for the existing network and consumption structure (14.02 percent);
- **Companies from Kosovo and Metohija** Since 1999 Electric Power Industry of Serbia has been financing three public enterprises from the territory of Autonomous Province of Kosovo and Metohija in the amount of salary for employees. Cost for this amounts to 5.2 billion dinars. Besides, EPS supplies the territory of the north part of Kosovo and Metohija with electricity.



## Production Plans Realization

Electricity generation in 2015 was at the planned level, and by 12 percent higher than in the previous year. Large differences in generation from thermal power plants are the result of floods and disturbances they caused in energy and primarily coal sector in 2014. Coal production in 2015 was also higher than the planned by one percent, and even by 27 percent compared to the production from the previous year.

External electricity supplies (including supplies for guaranteed and commercial supply) in 2015 are higher by one percent than the planned ones and by three percent compared to the achievement from the previous year. Supplies to other companies (including

export and supplies to licensed power traders) are less than planned by 16 percent, but are higher than realization in the previous year by 71 percent. That is the result of annual surplus that was in 2015 the fourth highest surplus for the last 15 years.

Electric Power Industry of Serbia with its own generation in 2015 fulfilled 96.7 percent of the customers' needs. Electricity procurement was 12 percent lower than the planned one and 55 percent lower compared to the previous year. Commercial procurement was also smaller in 2015 compared to the previous year by 64 percent.



## Realized Electricity Prices

The average selling electricity price in 2015 was 6.917 RSD/kWh. That is by one percent higher than planned and by one percent higher than the price from 2014. The average external selling electricity price for guaranteed supply was 6.714 RSD/kWh, while electricity supply for commercial supply (which includes the supply to eligible customers and supply for last resort supply) realized per the average selling price of 7.135 RSD/kWh. Licensed traders were supplied with the electricity at the average selling price of 4.735 RSD/kWh (refers to electricity price for high voltage without network fee).

Average electricity prices (RSD/kWh) external deliveries					
	Actual 2015	Plan 2015	Actual 2014	Index	
				2/3	2/4
1	2	3	4	5	6
<b>Low voltage (0.4 kV I level)</b>	<b>9.586</b>	<b>9.670</b>	<b>9.467</b>	<b>99</b>	<b>101</b>
<b>Mass consumption – total</b>	<b>6.443</b>	<b>6.314</b>	<b>6.357</b>	<b>102</b>	<b>101</b>
0.4 kV II level	8.191	8.225	8.278	100	99
households	6.262	6.141	6.144	102	102
<b>Public lighting</b>	<b>5.909</b>	<b>5.737</b>	<b>5.754</b>	<b>103</b>	<b>103</b>
<b>Total guaranteed supply (low voltage)</b>	<b>6.714</b>	<b>6.586</b>	<b>6.662</b>	<b>102</b>	<b>101</b>
<b>Deliveries for commercial supply</b>	<b>7.135</b>	<b>7.148</b>	<b>7.027</b>	<b>100</b>	<b>102</b>
<b>PE EMS deliveries (losses and own consumption)</b>	<b>5.169</b>	<b>5.237</b>	<b>5.360</b>	<b>99</b>	<b>96</b>
<b>External deliveries (on demand area of Serbia)</b>	<b>6.813</b>	<b>6.738</b>	<b>6.740</b>	<b>101</b>	<b>101</b>
<b>Deliveries to other companies (export, electricity traders)</b>	<b>4.655</b>	<b>4.540</b>	<b>4.510</b>	<b>103</b>	<b>103</b>
<b>Total Deliveries</b>	<b>6.917</b>	<b>6.832</b>	<b>6.820</b>	<b>101</b>	<b>101</b>

## Electricity Collection

In 2015 customers were invoiced 235.7 billion dinars for supplied electricity (including value added tax, excise tax and interests calculated for untimely payment to the supplier).

The highest collection rate in terms of activities was realized for the guaranteed supply (98.2 percent), while the lowest collection was for the last resort supply (73.4 percent). Compared to the same period in 2014, the collection for the last resort supply was increased by 20.2 percentage points. That is the result of the activities the supplier has undertaken during 2015 for the purpose of collection improvement.

# Electricity Supply

SALES CHARACTERISTICS			
Supply type	Number of metering points	Number of customers	Electricity (GWh)
<b>GUARANTEED</b>	<b>3,485,321</b>	<b>3,410,368</b>	<b>17,221</b>
LV I Level	25,519	23,680	1,521
CS	3,455,178	3,385,562	15,513
LV II Level	273,175	220,656	1,454
House holds	3,182,003	3,164,906	14,058
PL	4,624	1,126	187
<b>LAST RESORT</b>	<b>3,130</b>	<b>719</b>	<b>543</b>
HV	2		38
MV	227		353
LV	2,901		152
<b>COMMERCIAL</b>	<b>86,740</b>	<b>11,300</b>	<b>9,640</b>
HV	30		1,848
MV	3,828		5,659
LV	82,882		2,133
<b>TOTAL</b>	<b>3,575,191</b>	<b>3,422,387</b>	<b>27,404</b>

LV - Low Voltage  
 MV - Middle Voltage  
 HV - High Voltage

CS - Consumer Spending  
 PL - Public Lighting

# Electricity Trading



Electric Power Industry of Serbia performs electricity trading for the purpose of balancing and optimization of single energy portfolio of Balance Responsible Party PE EPS.

The company aims to achieve maximum profit from the available primary energy, as well as from the sale of system services to the transmission system operator.

In 2015, total electricity sale amounted to 36,686 GWh, of which 33,729 GWh were supplied within the EPS Group according to full supply contracts:

- To EPS Supply for the purposes of supplying end customers in the Republic of Serbia who

are entitled to a guaranteed supply and end customers at the free market;

- To Distribution system operator - EPS Distribution for the purpose of covering losses and own consumption;
- To power plants and coal mines for their own consumption for production of electricity and coal;
- For the purpose of pump-reservoir plants.

All end customers at the free market in Serbia, supplied by EPS Group, except for the Public Enterprise Elektromreza Srbije (PE EMS), were supplied by a company EPS Supply.

In 2015, as in the previous two years, based on full supply contracts concluded by public tender, PE EPS supplied to Elektromreza Srbije 950 GWh for the purpose of covering losses in the transmission system and for own consumption of PE EMS facilities.

In addition to the contract with end customers, PE EPS purchased and sold electricity according to supply contracts, including contracts at the free wholesale electricity markets, the agreement on long-term business and technical cooperation with the Power Utility of Republic of Srpska (EPRS), the contract with PE EMS on the electricity supply for compensation programs of control area of the Republic of Serbia and the contract with the Public enterprise Elektrokosmet.

## INCOME

**8.7** million EUR – additional income achieved by trading at free wholesale markets (compared with the price of supply for EPS Supply)

Under the supply contracts, a total of 1,042 GWh of electricity was purchased, out of which 213 GWh was purchased under contracts with the EPRS and PE EMS, while the total purchase at the free wholesale markets amounted to 829 GWh.

Total sale of electricity outside EPS Group amounted to 2,957 GWh, out of which 2,901 GWh were sold at free wholesale markets, and 56 GWh under contracts with EPRS, EMS and PE Elektrokosmet.

Cooperation with Power Utility of Republic of Srpska under the contract on long-term business and technical cooperation was successfully implemented in 2015 as well. 55 GWh were purchased and 56 GWh of electricity were sold.

Trading at the free electricity market was performed within the power system of the Republic of Serbia, on the borders of the system towards Bosnia and Herzegovina and Montenegro, and as of April 02<sup>nd</sup>, 2015, trading was performed for the first time in history at power exchange as well. Then the Subsidiary EPS Trading, a member of EPS Group, started selling

and purchasing electricity on the power exchange HUPX in Hungary.

The largest part of the energy purchased at the free market, about 90 percent, was implemented through a tender for the purchase financed by the World Bank loan (as part of the Floods Emergency Recovery Project of Serbia, the project for the rehabilitation of flood damage in 2014), as well as through the purchase of electricity on an annual tender of Power Utility of Republic of Srpska.

On the other hand, 63 percent of the energy was sold at the free market through long-term contracts (weekly and monthly contracts). The rest of the energy was sold by short-term contracts (spot market), where more than 50 percent of the energy was sold through the Subsidiary EPS Trading on the stock exchange HUPX.

The total volume of electricity trading at the free wholesale markets amounted to 3,730 GWh. Achieved additional income is the result of good optimization of the total portfolio of EPS group, i.e. maximizing revenues from the sale of surplus and minimizing expenses from the purchase of missing amount of electricity.

Also, compared with every reference price per hour at the free wholesale markets for 2015, and for the market in Serbia and the region this is the price on the spot market at the Hungarian exchange HUPX, the realized average price of the total trading volume was more favorable by 0.92 EUR per megawatt hour, which is about 2.5 million EUR addition to the total trading volume (net profit achieved in trading), as part of the total additional profits at electricity wholesale markets.

At free market in the Republic of Serbia electricity trading was performed with 30 companies licensed for trading, while at the borders of Serbia trading was performed with two foreign companies. In the region, direct trading was performed on the exchange HUPX.

Electricity trading in 2015 was characterized by good partnership relations with all participants at the electricity market. All obligations were fully met and in accordance with the agreements without delay in supply and receipt of electricity, as well as in the collection and payment of claims.

# Open Cast Mines



Mining Sector within Electric Power Industry of Serbia is key link in implementation of national energy balance and it is largely responsible for the operation of Serbian Power System.

With the undertaken activities regarding efficiency increase, by introducing state-of-the-art technologies, through better organization and improvement of en-

vironmental protection measures, coal remains basic energy resource in Serbia for electricity generation.

At open cast mines at the territory of the Republic of Serbia, where EPS manages production (Kolubara and Kostolac basins) 37 million tons of coal and 84.2 million cubic meters of overburden were produced in 2015.

Coal production (t)			
	Plan	Realization	Plan (%)
MB Kolubara	28,282,000	28,687,451	101
Kostolac	8,499,000	8,341,640	98
<b>TOTAL</b>	<b>36,781,000</b>	<b>37,029,091</b>	<b>101</b>

Overburden production (m <sup>3</sup> of solid material)			
	Plan	Realization	Plan (%)
MB Kolubara	55,550,000	47,297,919	85
Kostolac	42,000,000	36,897,434	88
<b>TOTAL</b>	<b>97,550,000</b>	<b>84,195,353</b>	<b>86</b>



## ELIMINATION OF FLOOD CONSEQUENCES

Catastrophic natural disasters and floods in 2014 caused the greatest damage to coal mines and significantly disturbed continuous production. Activities regarding elimination of flood consequences were continued in 2015.

### MB Kolubara

At beginning of the year, 57 million cubic meters of water remained to be pumped out from Open Cast Mine Tamnava-West Field. Further pumping out drained bucket chain excavator, spreader 4, two drive stations and three return stations. Pumping out was officially completed on April 26<sup>th</sup>, and later during regular protection of the mine from surface water it was continued.

Total amount of pumped out water from Tamnava mines (May, 2014 – July, 2015)		
Location of water pumping out	Recipient	Amount (m <sup>3</sup> )
OCM Veliki Crljeni	Kolubara	27,000,000
OCM Tamnava-West Field and OCM Tamnava-East Field	Kolubara Kladnica	191,000,000
Accumulation Vranicina	Kolubara	14,000,000
<b>TOTAL:</b>		<b>232,000,000</b>

Expert and Operational Team, established by the Ministry of Mining and Energy, was responsible for coordination of all activities regarding water pumping out from Tamnava mines. Significant contribution to team operation was provided by: Department for Emergency Situations, Serbian Army – River Flotilla, Environmental Protection Agency, Republic Hydrometeorological Service of Serbia and a number of companies and institutions. Assistance in providing pumps and related equipment was provided by Mine Kovin, RTB Bor, Public Utility Company Water Supply and Sewage Novi Sad, Plovput Belgrade, and People's Republic of China provided donation of high capacity pump.

Within repair of Kolubara mines, the largest works were performed on revitalization and replacement of flooded electrical equipment for which most of



the funds were spent. Electrical equipment was completely and almost entirely replaced. Complex devices like gearboxes required complete dismantling and replacement of sealing bearings and other damaged parts. Detailed servicing of pulleys and other transmission equipment at systems was performed and corresponding parts were replaced. Flood deposits were removed from steel structure of main machinery which was cleaned and washed, local corrosion protection was performed and supporting structure joints were inspected. Emergency reconstruction of Kladnica Dam was performed, and protection against waterways Vranicina and Skobalj was constructed at mines Tamnava-West Field and Veliki Crljeni. After purchase of electrical equipment, its installing, testing and preparation of As Build Design, bucket chain excavator Ers 1000/20 was commissioned.

### TPPs-OCMs Kostolac

Elimination of flood consequences was also completed at Open Cast Mine Kostolac in 2015. Operational Teams of Drmno, with their own technology and machinery, cleaned large amount of silt from the remaining machinery: bucket wheel excavator, two drive stations and bandwagen. Equipment was revitalized and put into regular production as soon as it was possible.

Implementation of strategic projects was continued within Mining of Electric Power Industry of Serbia during 2015. At MB Kolubara it is resettlement of Vreoci Village for the purpose of existing mines extending and opening of new ones in the future, and project of environmental protection improvement. In Kostolac, within the project of new unit construction at TPP Kostolac B that is extending of Drmno mine.

# Power Plants



EPS' power plants generated 35,661 GWh of electricity, which is 99.6 percent of the planned generation. That is by volume the fifth largest generation in the last 15 years.

In overall generation structure, the share of thermal power plants was 70.2 percent, the share of hydro power plants was 29.7 percent, and combined heat and power plants' share was 0.1 percent.

During the first quarter of 2015, coal supply was still primarily affected by the floods in May 2014. It significantly affected the power plants generation in 2015.

The highest monthly surplus, not only in this year, but ever since 2001, was realized in May, and amounted to 671 GWh.

## QUARTERLY GENERATION

**Q1: 9,687 GWh**

In this quarter, thermal power plants generated the smallest volume of electricity in the previous 11 years (6,011 GWh). All parameters of thermal units operation were the weakest in the last 10 years, which was partly affected by the floods in mining sector in 2014.

### MONTHLY GENERATION

**3,506** GWh - maximum (December)

**2,235** GWh - minimum (September)

### DAILY GENERATION

**124** GWh - maximum (08<sup>th</sup> December)

**67** GWh - minimum (12<sup>th</sup> September)

On the other hand, hydro power plants generated maximum of 3,641 GWh and they took share of 37.6 percent in total generation performed with the best parameters of technical efficiency. That is one of the highest shares of hydro power plant generation in total EPS' generation. It is very unusual for HPPs to generate more electricity in Q1 than in Q2.

### **Q2: 8,991 GWh**

It was a maximum generation in Q2 in the last 26 years. Thermal power plants generated 5,693 GWh, and this is the second highest generation in Q2 in the last 15 years. Compared to 2014 the volume of generated electricity is higher by even 35.7 percent.

Hydro power plants generated 3,299 GWh of electricity.

What is characteristic for electricity generation in this quarter is that it represents the highest inter-seasonal difference. It is a result of reduced generation in TPPs due to disruption in open cast mines operation, caused by floods in 2014.

In this quarter, the highest surplus of 1,710 GWh was realized.

### **Q3: 7,525 GWh**

In the third quarter, TPPs generated 5,927 GWh, which is the third highest realization in terms of volume in the last 15 years. The generation was even by 55 percent higher than in 2014. Never before have the volumes of thermal power plants generation in Q1, Q2 and Q3 been so similar, since inter-seasonal differences have also been the highest this year.

Hydro power plants also recorded high generation (1,598 GWh). The volume of generation was only lower in 2003. Their share in total generation was 21.2 percent.

### **Q4: 9,458 GWh**

In Q4, TPPs generated 7,387 GWh, which is the third highest generation by volume in the last 15 years. Hydro power plants generated 2,061 GWh which represents one of the lowest generation of HPPs.

Quarterly generations in 2015 are characterised by minimum difference between volumes of Q1 and Q2 in the amount of 694 GWh (the average is about 2,000 GWh). The difference between generation volumes was also small in Q1 and Q4. On the other hand, the difference in generation between Q2 and Q3, in the amount of 1,463 GWh, is the highest since 2001.

Characteristics of electricity generation in 2015:

- Maximum generation in Q2;
- Maximum cumulative surplus for the period January – June;
- Maximum cumulative monthly surplus in May;
- Maximum generation of thermal power plants in December;
- Maximum generation of hydro power plants in Q1;
- Maximum generation of hydro power plants for the period January – June.



## THERMAL POWER PLANTS

Thermal units in branches TENT and Kostolac generated 25,017 GWh, which is by five percent higher than planned and by 22.3 percent higher than in 2014. That is the third highest generation in terms of volume in the last 25 years.

### THERMAL POWER PLANTS GENERATION

**19,028** GWh - TENT

**5,989** GWh - TPPs-OCMs Kostolac

### MAXIMUM GENERATION IN DECEMBER

**2,769** GWh - TPPs in total

**2,101** GWh - TENT

**1,111** GWh - TENT A

**218** GWh - TENT A3

**665** GWh - TPPs-OCMs Kostolac

**465** GWh - TPP Kostolac B

**231** GWh - TPP Kostolac B1

**234** GWh - TPP Kostolac B2

### DAILY GENERATION

**93** GWh - maximum (25<sup>th</sup> December)

**49** GWh - minimum (12<sup>th</sup> April)

For the first time in one year, until October, thermal power plants realized the highest monthly generation in July, which was the third, in volume in a year. TPPs generation in Q1 is one of the lowest, and in Q4 one of the highest.

## RAILROAD TRANSPORT

For the needs of electricity generation in branch TENT, 28.4 million tons of coal was consumed in 2015.

27.7 million tons were transported by TENT's rail-road transport, which exceeded transportation plan by 2.9 percent. Coal railway transportation depended on coal production on open cast mines.

The highest monthly coal transportation was in December and it amounted to 2.8 million tons. The highest monthly coal consumption and the highest monthly production of the branch TENT were realized in that month.

8.1 million tons of coal were consumed for electricity generation in the branch TPPs – OCMs Kostolac.

## COMBINED HEAT AND POWER PLANTS

Generation of combined heat and power plants in 2015 amounted to 45 GWh, and that is their lowest generation in the last 15 years. They took the share of 0.1 percent in total EPS' generation.

Electric Power Industry of Serbia strives to use these capacities as cost-efficiently as possible, without denying the technical feasibility of combined heat and power plants.





## HYDRO POWER PLANTS

Hydro power plants generated 10,599 GWh of electricity and thus fulfilled 98 percent of the planned generation. Their annual generation was at the level of the average generation in the last 26 years, and they exceeded the generation plan in the period January – May, as well as in October.

All reservoir power plants (except HPP Uvac) realized planned generation. They generated 1,861 GWh, which is the third highest realization in the last 25 years. That generation is by 17 percent higher than the planned one, and also by 22 percent higher than the generation in the previous year. Never before has the level of reservoirs remained constant through the entire year as it was the case in 2015. This is another evidence of system operation stability. At the end of the year, energy capacity of reservoirs was higher than planned.

Run-of-river HPPs generated 8,738 GWh of electricity, which is five percent lower than planned generation. Planned values were realized only by Djerdap and Zvornik.

On a monthly basis, run-of-river power plants were mostly engaged in April (1,118 GWh), while reservoir power plants were mostly engaged in March (256 GWh). The lowest engagement of hydro power plants was in September, when run-of-river power plants generated 368 GWh of electricity, and reservoir power plants 70 GWh of electricity.

Inflows on the rivers Danube and Sava in Q1 were optimal for generation because they were the highest in that period. With all variations, the average annual Danube's inflow (4,903 m<sup>3</sup>/sec) was by 10 percent lower than perennial average, and by 18 percent lower than in the previous year. Average annual inflow on the Drina River amounted to 293 m<sup>3</sup>/sec and was also by 10 percent lower than perennial average and by 17 percent compared to the previous year. Favourable hydrology conditions are the reason why hydro power plants realized maximum generation in Q1.

All the available water potential was processed by hydro power plants, with no technical limitations in equipment operation.

### MONTHLY GENERATION

**1,338** GWh - maximum (April)

**437** GWh - minimum (September)

### DAILY GENERATION

**54** GWh - maximum (16<sup>th</sup> April)

**10** GWh - minimum (25<sup>th</sup> September)

## TECHNICAL EFFICIENCY OF GENERATION CAPACITIES



### THERMAL POWER PLANTS

In 2015, total time of full capacity operation was increased, and units spent less time in planned downtimes. The period of units' cold reserve was the same as in 2014, while the period of hot reserve was slightly shorter.

**Engagement coefficient (Ke)** amounted to 77 percent and was by 13 percent higher than in the previous year.

**Equivalent duration of operation (Etp)** is period of units' operation with nominal capacity and amounted for 6,204.6 hours. This increase is equal to weighted thermal unit operation with nominal capacity 46 days longer than in the previous year. Engagement of power plants was fifth in volume in the last 23 years.

**Generation coefficient (Kp)** is the ratio between power plants' average realized capacity during operation and installed capacity. It was 91 percent, which is by almost two percent higher than in the previous year.

**Capacity utilization coefficient (Ks)** depends on the units' operating time and realized capacity during the engagement. In 2015, coefficient was by 13 percent higher compared to 2014.

**Cold reserve coefficient (Khr)** of available units amounted three percent of calendar time, same as in

2014. The longest cold reserve time had TPP Kolubara (units A3, A5 and A1).

**Operational readiness coefficient (Kps)** amounted to 80 percent and was by 12 percent higher than in 2014. The best operational readiness had unit A1 in TPP Kostolac and units A4 and A6 in TENT.

**Planned downtime coefficient (Kpz)** in 2015 was by six percent lower compared to the previous year, and amounted to 14 percent.

**Reliability coefficient (Kpu)** was 94 percent and was 0.3 percent lower than in the comparative period. The most reliable units were TENT B6 (98 percent) and TPP Kostolac A1 and TENT A5 (97 percent each).

**Equivalent coefficient of forced outages (Eki)** includes failures due to which unit cannot be engaged, forced outages due to non-technical reasons and units' unavailability. It amounted to 12 percent.

A minimum number of forced outages was in September, while a maximum number was in February. Total number of forced outages amounted to 193, which is almost by third lower than in 2014. Forced outages in TPPs were caused mostly by boiler plants and pipe systems.

## COMBINED HEAT AND POWER PLANTS

TPPs-CHPs operated hardly 2 percent of the time in 2015, which is the shortest engagement time in the last 25 years. Accordingly, coefficient of capacity utilization amounted to slightly over one percent. Only unit 2 in TPP-CHP Novi Sad was engaged.

## HYDRO POWER PLANTS

Full capacity operating time was reduced by 886 hours, compared to 2014. The longest full capacity operation of hydro power plants was in April, while the shortest one was in September.

**Planned downtimes coefficient (Kpz)** amounted to 11 percent and by two percent was lower than in the previous year. The planned downtimes mostly occurred on unit five and unit one in HPP Djerdap 1, due to power plant revitalization.

**Forced outages coefficient (Ki)** amounted to 0.3 percent. Hydro power plants are reliable facilities in which forced outages rarely occur. As of this year, monitoring of forced outages is introduced in EPS, and

their total number amounted to 74. They mostly occurred due to various electrical protections on units.

**Engagement coefficient (Ke)** utilization factor is the time that weighted unit of HPP spent in operational mode and it amounted to 52 percent. Maximum engagement coefficient was realised only by unit A1 in HPP Kokin Brod. Compared to 2014, in this year engagement of run-of-river power plants was reduced, while engagement of reservoir power plants was increased.

**Capacity utilization coefficient (Ks)** amounted to 41 percent, and by almost 5 percent was lower than the realized one in the previous year. It was reduced in run-of-river power plants, while it was increased in reservoir power plants.

**Generation coefficient (Kp)** amounted to 80 percent, which is by 6 percent lower than the one from 2014.

**Operational readiness (Kps)** of all hydro power plants amounted to 85 percent. Maximum operational readiness had units 1, 6 and 8 in HPP Djerdap 2 (100 percent) and in HPP Bajina Basta (96 percent).



## OVERHAULS

In addition to recovery from the 2014 flood effects, Electric Power Industry of Serbia continued rehabilitation and modernization of power capacities during 2015. The objective was to keep the facilities in acceptable technical condition by regular application of preventive maintenance and particularly due to good technical diagnostics, and thus to provide more reliable supply of customers, with higher energy efficiency and acceptable environmental influence.

Program of maintenance of facilities for electricity generation covered regular maintenance (planned-preventive and corrective, i.e. emergency maintenance) and overhauls (standard, prolonged and major).

In 2015, standard overhauls in 13 units of thermal power plants, four units of power plants for combined heat and power generation and 45 units of hydro power plants were performed. Overhaul timeline with respect to thermal power plants was harmonized with optimal electricity trading plan, duration of investment activities and program of overhauls of mining capacities. Overhaul timeline with respect to hydro power plants was planned based on hydrologic data from the previous years.

### Thermal Power Plants

#### Unit TENT A2

At the beginning of July, overhaul works in the Unit TENT A2 in Obrenovac, which were both the most time-consuming and the most complex works compared to any of the plants in the branch TENT in 2015, began. Within the major overhaul of this 210 MW unit, which lasted for 110 days, the major overhaul of turbine was performed, sealing of the false ceiling of the boiler room was completed and a part of the pipe system in the boiler facility was replaced, as well as the chamber of the superheater 4.

#### Unit TENT A3

At the beginning of February, the major overhaul of the unit A3 in the Thermal Power Plant Nikola Tesla A was finished. The unit capacity was increased by 23 MW. After more than seven months of the complex works in this unit, two thirds of the equipment were replaced.

#### Unit TPP Kostolac A2

During general overhaul repairs were performed in turbo generator plant, vital parts of piping system were replaced and unit control system was modernized.







### **TPP Morava**

During a five-month overhaul, beside the standard works, large investment work on turbine-generator unit was completed. The most extensive works were done by replacement of the middle pressure turbine and the central bearing unit. Factory overhaul and balancing in the high pressure rotor tunnel were performed, a generator radial sealing system was installed, factory overhaul of the generator rotor and installed thyristor excitation installed. The existing regulation system of turbine was also reconstructed, by-pass stations were completed, critical surfaces of economiser were replaced and boiler drum repaired.

### **Hydro Power Plants**

#### **HPP Djerdap 1 Unit A5**

At the end of April, a sixteen and a half-month rehabilitation of the unit was completed. Around 1,300

tons of new equipment, new automatic management and the cutting edge electronics in protection were installed. Capacity of the unit was raised by 15 MW.

#### **HPP Djerdap 1 Unit A1**

Rehabilitation of the unit started in August and the deadline for completion is one year. Installation of 1,500 tons of generator and turbine equipment is planned.

#### **HPP Zvornik Unit A1**

Rehabilitation of the power plant began mid-October. The works on each of four units will last 12 months respectively and will be completed within four years. The rehabilitation is valued at 70 million euros, and is financed from the loan of the German Development Bank KfW. After rehabilitation, total capacity of the unit will be 125.6 MW, which is by 30 percent more than the current capacity of 96 MW. The first unit to be rehabilitated is unit A1.

# Electricity Distribution



## SUBSIDIARY DSO EPS DISTRIBUTION

In 2015 in accordance with the Reorganization Plan of Electric Power Industry of Serbia the status change of merging the subsidiaries for electricity distribution was conducted. Elektrovojvodina, Elektrosrbija, Jugoistok and Centar were joined to the subsidiary Elektrodistribucija Beograd by acquisition on July 01<sup>st</sup>. On the same date, Elektrodistribucija Beograd changed its business name into Distribution System Operator EPS Distribution. Thus, EPS fulfilled the obligation of forming one distribution system operator whose task is to perform energy activity of general interest – electricity distribution and distribution system management.

This has brought a number of benefits for both EPS system and distribution system users. Also, it created the opportunity to reduce costs through centralization of activities such as procurements, large investments planning, administration reduction, etc. Efficiency has been increased and corporate gover-

nance has been improved. Service level becomes equal for the entire territory of Serbia and single subsidiary EPS Distribution also provides more balanced development of all regions in Serbia. Particular regions in the country can now cooperate much faster in case of emergency.

One of the most important activities of the single operator is distribution network gradual automation, thus major prerequisite to supply electricity under equal conditions to all customers in the country has been created. It includes reduction of interruption frequency and duration, voltage improvements, reduction of the time necessary for interventions, etc. Distribution network automation will create the conditions in which all customers will be supplied with the electricity of equal quality and it will also create the conditions in which it will be possible to define electricity quality in advance under the contract with the supplier. Aims are to increase operational distribution system readiness, reduce losses and increase investments.

Market operations created the conditions in which distribution system operator is transparent and neutral towards all market participants. Since network fee, as a part of distribution, is the same for everyone, everyone can choose the supplier only according to the offer. Unique conditions are being created for the connection of all customers to the distribution system, particularly electricity generators.

One of the major priorities of DSO EPS Distribution is to reduce electricity losses. Plan regarding the measures and activities that will be conducted in the following period in all parts of the company has been created. All employees will participate in these activities and this will be one of the most important tasks. Now, the controls are massively conducted in the branches with the highest losses which brought good results.

Strategic commitment of EPS Distribution is to establish unique management at the territory of Serbia. To achieve this goal, establishment of national distribution dispatch centre in Novi Sad began in September 2015. Unique software that will be installed in all regional dispatch centres as a monitoring tool is foreseen. National distribution dispatch centre will control the operation of smaller centres and it will have the management function in the cases of accidents.

In accordance with the Company Law, DSO EPS Distribution formed thirty-three branches organized according to the regions at the whole consumption area of all distribution regions of the company. A separate organizational unit i.e. body for monitoring the harmonization for provision of non-discriminatory

behaviour operates within EPS Distribution. In accordance with the obligation of distribution system operator pursuant to the Energy Law, EPS Distribution also formed Customer Complaint Division within the Market Support and Losses Reduction Department.

### Strategy and Investments in Distribution

Creation of unique network maintenance policy, investment planning and operational readiness increase is the major priority of Distribution System Operator EPS Distribution. In 2015, DSO, as one of the largest investors in the Republic of Serbia, constructed and reconstructed a number of power facilities.



	Losses in 2015 (in percent)
Centar	16.5
Jugoistok	16.2
Elektrosrbija	15.6
Beograd	14.5
Elektrovojvodina	10.4
EPS Distribution	14.02

## CONSTRUCTED FACILITIES

Distribution region	Power facilities	Description
Novi Sad	110/35/20 kV SS Sremska Mitrovica 1	SS is constructed at the location of the existing one. Obsolete and unreliable equipment was replaced and capacity has been increased
	110/35/20 kV SS Becej	SS was reconstructed and upgraded. Obsolete and unreliable equipment was replaced and capacity has been increased
	110/20 kV SS Pecinci – II phase	Second 110 kV tariff bay was equipped and 20 kV plant was fully replaced
Kraljevo	110/10(20) kV SS Jagodina 3	New SS was constructed
	110/35/20 SS Ljig	New SS was constructed
	110/20 kV SS Vladimirci - I phase	SS was reconstructed with 35 kV at the designed voltage level 110/35/20 kV
	110/10 kV SS Krusevac 3 - I phase	SS was reconstructed and upgraded with full reconstruction of civil and energy part by introduction of 110 kV
	35/10 kV SS Zlatibor 3	New SS was constructed
	35/10 kV SS Dudovica	New SS was constructed
	35 kV Overhead Line Drina – Rogacica	New overhead line was constructed
	35 kV Overhead Line Cacak – Zablace	New overhead line was constructed
	35 kV Cable Line Gornji Milanovac – Takovo	New cable line was constructed
Nis	110/35 kV SS Majdanpek 2	110 kV bay was equipped
Kragujevac	110/10 kV SS Divlje Polje	SS is upgraded with 110/10/10 kV power transformer, 31.5 MVA
	35 kV Cable Line Veliko Gradiste 2 – Veliko Gradiste 3	Double cable line, 3.3 km long was constructed

## COMMENCED CONSTRUCTION

Distribution region	Power facilities	Description
Novi Sad	110/20 kV SS Sombor 1	SS upgrade and replacement of obsolete and unreliable 110 kV and 20 kV equipment
	110/20 kV SS Krnjesevci	Construction of entire 110 kV and 20 kV plants
	110/20 kV SS Ada	SS reconstruction
Belgrade	110/10 kV SS Beograd 41 (Blok 32)	Construction of new SS in the office building
	110 kV Cable line Beograd 5 – Beograd 41	Cable line is foreseen for the supply of new 110/10 kV SS Beograd 41 and auxiliary supply of the existing 110/10 kV SS Beograd 40 from Beograd 5
	35/10 kV SS Technical Faculty	Reconstruction of 35 kV switchyard and 10 kV switchyard by installation of new cells with relay protection and local and remote control
	35/10 kV SS Padinska Skela	SS reconstruction and construction of new facility with 35 kV switchyard and 10 kV switchyard
	35/10 kV SS Kaludjerica	SS reconstruction and construction of new facility with 35 kV switchyard and 10 kV switchyard
	35/10 kV SS Zemun centar	SS reconstruction and replacement of 35 kV and 10 kV switchyards
Kraljevo	110/10 kV SS Kraljevo 6 Ribnica	Construction of new SS
	110/20 kV SS Vladimirci - II phase	Refurbishment of 35 kV SS to 110/35/20 kV voltage level
	110/35/10 kV SS Kopaonik	Construction of new SS
	110/10 kV SS Krusevac 3 - II phase	Refurbishment and upgrade with the reconstruction of civil and energy part by introduction of 110 kV voltage
	110/35 kV SS Lazarevac	Equipping 110 kV bay for the connection of 110 kV overhead line Lazarevac - Ljig
	35/10 kV SS Rogacica	Construction of new SS
	Nis	110/35 kV SS Mosna
110/35/10 kV SS Nis 15 Doljevac		Construction of new SS
110/35/10 kV SS Sokobanja		Construction of new SS
110/10 kV SS Nis 6		Construction of new SS
110/35/ kV SS Aleksinac		SS reconstruction
35 kV Overhead Line SS Nis 1 – Doljevac		Construction of new overhead line 3 km long
Kragujevac		110/35/10 kV SS Pozarevac 2
	110/10(6) kV SS Smederevo 5	Construction of new SS
	35/10 kV SS Smederevska Palanka 4	Construction of new SS

# Strategy and Investments



Realization of long-term sustainable development, securing competitiveness, responsible investments through optimized investment portfolio and business operation optimization together with savings, should result in continuous company value growth.

In 2015, in addition to maintaining the reached generation level, EPS continued to perform activities that will increase the safety of electricity and coal production, safety of customers supply and improvement of environmental protection.

Initiating the corporatization process enabled legal, organizational and financial unbundling between the activities of general interest and market energy activities and status change and organizational improvements within EPS Group were performed. Standardization, unification and optimization of business processes, implementation of new management method and organizational model have been initiated.

Investment activities in 2015 were primarily focused on the implementation of already initiated investment projects, preservation of electricity supply safety and maintenance of power system operation. Business operation in the first quarter of the year was affected by the financial consequences of devastating floods in 2014.

Scope of priority activities was analysed by the assessment of overall status and limitations, expected short-term and long-term effects of particular investments, as well as potential consequences of further non-investing. As assessed, funds from own and external sources have been provided for these investments. With intention to avoid the additional borrowing of EPS as much as possible, investment plans were defined by restrictive available funds for the implementation of necessary activities that provide for the electricity supply safety and maintenance of reliability level of power system operation.

## Mining

In order to secure sufficient quantities of coal, revitalization projects on existing equipment are being implemented, replacement mines are being opened and preparatory activities for the opening of new mines are being performed.

Village Vreoci resettlement project procedure was continued at MB Kolubara. One of the most important projects within the mining sector is Environmental Improvement Project at EPS and MB Kolubara. The aim of the project is to secure safe and continuous coal supply and rational management of natural resources, with the reduction of air pollution in thermal power plants that use lignite from MB Kolubara. Procurement of excavator, spreader and conveyors with 2,000 mm wide belts together with energy supply system was conducted for new production ECS system for the open cast mine Field C. Equipment was mounted in 2015 and ECS system and trial operation is planned for 2016. Installation of the spreader of 12.000 m<sup>3</sup>/h capacity for inter-burden for OCM Tamnava-West Field, as well as the equipment for coal quality management system and homogenization is contracted.

Investments in coal production that were implemented in 2015 at OCM Drmno refer to the procurement of missing equipment in accordance with the updated study and technical documents for the mine

Drmno capacity increase, procurement of equipment for deep dewatering, auxiliary mechanization (pipe layer, bulldozer, backhoe), land purchase for the needs of the expansion of mining works location, geological and research works for the purpose of OCM Drmno expansion to the annual capacity of 12 million tons. Feasibility Study for the extension of this mine showed that the additional ECS system that will excavate up to 56.5 million m<sup>3</sup> per annum should be built in order to increase the overburden production. This system will produce 12.5 million m<sup>3</sup> of overburden and it includes 2000 class excavator, i.e. 7200 spreader.

Most significant projects, studies and activities regarding scientific and research work and preparation of investment and technical documents in PE EPS in 2015 are the following:

- Long-term program of coal exploitation in EPS coal mine basins;
- Basic Design together with the Feasibility Study for introduction of the system for operational management and coal quality control at OCM Drmno in Mine Basin Kostolac;
- Feasibility Study with Basic Design for the construction of waste water treatment plant in Kolubara Prerada.



## Power Plants

After more than two decades Serbian energy sector will get the new generation plant by construction of the third unit in TPP Kostolac B. Construction project is financed from the loan of China Exim Bank and it amounts to 715.6 million dollars. Based on the agreement with the company CMEC from China (China Machinery Engineering Corporation), deadline for the construction of new unit is 58 months. During 2015 necessary activities on this project significant for the whole country were continued.

In octobar 2015, the reconstruction of HPP Zvornik, started. By the Loan Agreement with KfW bank from Germany a consultant "Lahmeyer/SEEK" was engaged; contract for delivery, installation and commissioning of the equipment was signed with "Voith Hydro GmbH". Works on each of four units will last for 12 months and they will be completed within 4 years. After revitalization, total capacity of the units will be 125.6 MW, which is by 30 percent higher than current 96 MW capacity.

Revitalization of HPP Djerdap 1 was continued, primarily revitalization of unit number 1. According to the work plan, in addition to the revitalization of two remaining units (A2 and A3), complete works should be finalized in September 2018.

Significant investment activities that were performed in electricity generation sector were focused on the standard overhauls and revitalization of particular units, complying with all environmental protection measures. EPS invests in the construction of new small hydro power plants, solar power plants and wind farms.

## Electricity Distribution

Strategic projects in distribution sector refer to the facilities, network and metering infrastructure. Subsidiary Distribution System Operator - EPS Distribution is responsible for the strategic projects in this sector.







## ENVIRONMENTAL PROTECTION

By signing the Treaty Establishing Energy Community and adopting the relevant national regulations harmonized with the relevant European Union directives, Electric Power Industry of Serbia is obliged to harmonize the operation of production and distribution sector with relevant EU standards in the field of environmental protection. EPS environmental projects that are being implemented as well as those planned to be implemented, represent significant part of the activities that have to be conducted within the process of accession of the Republic of Serbia to EU.

Obligation and responsibility of EPS is to have environmental protection as an important part of the strategy for development and operation of the company and therefore around EUR 1 billion is planned to be invested during the period from 2015 to 2025.

The most important projects and programs within the field of environmental protection refer to the reduction of emissions of air pollutants from thermal power plants, i.e. harmonization with the limit values of emissions for sulfur and nitrogen oxides and particulate matters.



## Thermal Power Plants

In the previous period, Electric Power Industry of Serbia invested significant funds in the projects regarding the reduction of adverse impact of thermal power units on air quality. Most significant environmental protection projects in 2015 are the following:

- Construction of flue gas desulfurization plant in TPP Kostolac B will improve the environmental protection and reduce by half the emission of particulate matters into the air. This environmental project is implemented within the first phase of the Chinese loan arrangement for Thermal Power Plant Kostolac B. Value of the project is 130.5 million dollars. In 2015, 177 m high stack was constructed at the flue gas desulphurization plant. Construction of 22 km long industrial railway from the station Stig to TPP Kostolac B is also the part of this project. The aim is to secure continuous and cheaper limestone transport to TPP Kostolac B with the new transport solution. Limestone will be used in the flue gas desulphurization process. At the same time transport of by-products (gypsum and dry ash) from power plant as well as the transport of coal to TPP Morava in Svilajnac will be ensured. Two sets of trains are planned to operate and they will daily transport 2.000 tons of load;
- Electrostatic precipitator reconstruction in TPP Morava – plan is to include this project into general overhaul of the power plant;
- Implementation of primary measures in the aim of reducing NOx emissions on Unit B1 at TPP Kostolac B;
- Replacement of the existing and introduction of new technology for collection, transport and disposal of ash and slag at TPP Kostolac A. The new system includes equipment that transports ash and slag to ash dump after collection from units of thermal power plants using the new technology (thick mixture of ash and slag with water in the ratio 1:1). Besides new equipment, new ash pipeline was constructed within TPP Kostolac A from power plant to ash dump at open cast mine Cirikovac. The construction of this system creates conditions for the permanent closure of Middle Kostolac Island dump, that will also solve the issue of ash scattering over the city Kostolac and surrounding settlements;
- Forming the wind protection zone for forest species on the ash and slag landfills for the purpose of preventing ash wind erosion and reclamation of open cast mines;
- Construction of waste water treatment plant in TENT A and TENT B, as well as in TPP Kostolac B. Preparatory activities for the construction of such plant at TENT A location were initiated in 2015. The value of the project is EUR 6 million and it is financed by EU donation. The aim of this important environmental project is to bring all waters that go to the river Sava from TENT A location at the level prescribed by the standards of European Union. The project is comprised of five parts, and each includes processing of different types of waste water. After being treated, some of the processed water is planned to be used again in the power plant.

Since EPS' thermal power plants annually produce 6 million tons of ash during the coal combustion process, the decree on the use of ash in construction adopted by the Ministry of Construction, Transport and Infrastructure in 2015 is of utmost importance. The priority obligation of Electric Power Industry of Serbia regarding this decree is bringing ash quality at the level of defined standards, since the ashes produced in EPS' power plants are of somewhat bigger granulation. Therefore the introduction of new technical solutions for the process of electricity generation in thermal power plants will be needed.

Studies that would show the possibilities of using the ash as a construction material in construction and road industry, i.e. its use for the construction of railway

and traffic infrastructure, as well as for the construction of buildings and civil works are being prepared.

Also, fly ash quality assessment in thermal power plants has been initiated according to the European standards – certification of ash according to the standard SRPS EN 450, that refer to chemical and physical properties of fly ash.

In previous years PE EPS intensively worked on obtaining the integrated (IPPC) permit for ten thermal power plants. Applications were submitted to the competent ministry within the defined deadline and in accordance with legal requirements. Additional documents preparation has been initiated and its completion is planned for 2016.



## Mining

“Environmental Improvement Project in Kolubara Coal Basin” is the most important environmental and investment project in mining sector. The project includes introduction of the system for coal quality management and homogenization in the west part of MB Kolubara, modernization of the equipment through the procurement of new excavator-conveyor-spreader (ECS) system and energy supply system for OCM Field C and procurement of the spreader for inter-burden for OCM Tamnava- West Field.

The first part of the project is project A – designing, preparation and installation of ECS system for the future open cast mine Field C. The value of this part of the project is EUR 80 million, and it is EBRD loan. Project B includes spreader for inter-burden for open cast mine Tamnava-West Field, with the capacity of 12.000 m<sup>3</sup>/h, and project C includes coal quality management system on Tamnava open cast mines. KfW bank

provided loan for projects B and C in the amount of EUR 65 million, as well as EUR 9 million of grant.

Implementation of the project, also known as “green” will provide for great financial savings in the production process, rational use of coal as non-renewable natural resource and safe supply of power plants with the lignite of uniform quality. Emission of CO<sub>2</sub>, SO<sub>2</sub> and NO<sub>2</sub> from power plants that use lignite from MB Kolubara will be reduced by 3 percent annually, and the quantity of ash and slag produced during the coal combustion will be reduced by about 885,000 tons annually. The project is of technological, environmental and social significance, and its implementation will bring around EUR 26 million of savings annually. The use of this natural resource – coal – will be reduced by a million tons. Total value of the project amounts to EUR 182 million. Its financing will be supported by EBRD, German KfW bank, and EPS will invest EUR 28 million.





For the purpose of production of high quality biomass, several studies are being implemented regarding the use of devastated areas created by decades-long coal excavation. Biomass creation concept with simultaneous biological reclamation of soil, is based on use of perennial and high-yield plants (*Miscanthus giganteus* and *Pennisetum purpureum*), following and implementing the modern trends related to this field. With higher annual yield in relation to other plants, noninvasive nature, relatively low demands regarding production and high phytoremediation potential, these plants are most appropriate for biomass creation.

Study "Audit of Environmental Protection at Sites and Plants of PE EPS and Branch MB Kolubara" is completed and Action Plan is prepared. Its implementation is planned for 2016. Project "Preparation of Chemicals Register for PE EPS and Branch MB Kolubara" is completed together with software solution for chemicals

monitoring. Software installation has started, matrix of responsibility has been prepared, and persons responsible for reporting are trained for the proper use of the software.

In MB Kolubara waste water treatment program for waste water from mines Tamnava-West Field, Tamnava-East Field and plant Drobilana at Kalenic is on-going. There are also projects "Environment Monitoring Plan" and "Project for Organization of Regional Water System", which establishes water monitoring in accordance with European Directive on water, as well as installation of plant for waste water treatment complied with the Law on Water Quality Measurement.

In the branch TPPs-OCMs Kostolac the process of site critical potentials identification is on-going through the continuous monitoring, for the purpose of undertaking specific actions for their positioning and setting within legal framework.



### **Hydro Power Plants**

Investment and technical documentation, i.e. “Pre-feasibility Study with Preliminary Design for waste water collection and treatment in HPP Djerdap” and “Technical and Economic Analysis of the Management of Floating Waste in Drinsko-Limske Hydro Power Plants” were prepared. Preparation of the following study, i.e. “Preparation of the Registry of the Pollutants of Reservoirs and Catchment Area of PE EPS Hydro Power Plants” is being initiated.

### **Waste Management**

In accordance with the legal obligations within the field of waste management, waste management projects and the waste transport control are being con-

ducted across all parts and branches of Electric Power Industry of Serbia.

PCB Oil and Equipment Treatment Project is conducted as a part of the donation (PE EPS share) from IPA 2008 program. The first part, i.e. Status Update – “Preparation of Inventory and Possibility of PCB Destruction by Existing Domestic Technologies” is completed. Implementation of the second part, i.e. “Project IPA 2008 – support for the environmental protection in energy sector and solving the issue of electric devices filled with PCB oils in EPS” has been initiated. These activities will solve the issue regarding PCB transformer and condenser that will be replaced by new ones without this oil. Transformers and condensers that contain contaminated PCB oil will be decontaminated with the reuse of processed oil.

## Cooperation with Institutes and Faculties

Cooperation with scientific and research institutions, universities, institutes and professional associations provides for Electric Power Industry of Serbia the significant support for further business development. This cooperation brings benefits for both sides: scientific and professional cooperation enables solving the issues in generation and technological development and upgrading the knowledge and skills of employees forms the experts necessary for electric power industry. With intention to apply the best global positive practice in technological and business development, by participation of its experts in the operation of domestic and international professional organizations, Electric Power Industry of Serbia strives to improve its business operation and maintain the competitiveness at the market.

EPS supports and helps the operation of the most significant state institutes, institutions and associa-

tions in the field of education and science: institutions of higher education and faculties of the University of Belgrade, Serbian Academy of Science and Art, Institute Nikola Tesla and Institute Mihajlo Pupin, Union of Engineers and Technicians of Serbia, Society of Thermal Engineers of Serbia and international professional associations such as CIGRE, CIRED, EURELECTRIC, EUROCOAL and ECOBA. During 2015 the significant cooperation in the field of science was realized through the preparation of a number of studies and published researches in the field of PE EPS business operation, preparation of necessary development design documents, investment and technical documents and spatial and planning documents.

Electric Power Industry of Serbia aims to engage domestic manufacturers and implement innovations of national science as much as possible. This represents important segment of company's business policy and its corporate responsibility.



# Renewable Energy Sources



Strategic interest of the Electric Power Industry of Serbia is to increase the share of renewable energy sources in electricity generation. This is in accordance with strategic documents related to development of energy sector in the Republic of Serbia and also in compliance with the principles of the European Union. With the vision to keep the significant influence it has in the energy sector in the region, it is the choice of PE EPS to apply state-of-the-art technologies in the field of renewable energy sources use, efficiency increase and cost-effective and sustainable energy development, primarily using water resources.

PE EPS priorities are to continue rehabilitation and modernization of the existing large and small hydro power plants, construction of new ones, but also development of wind farms and solar power plants. A significant share of biomass use is expected in electricity generation.

Electric Power Industry of Serbia is committed to engage its sources, to the adequate level, for utilization of hydro potential of all watercourses where it would be possible to build hydro power plants, whether on the locations already in the possession of the company or in their immediate vicinity. In addition to these locations, PE EPS commenced preparation of technical documentation for construction of small HPPs on the locations obtained in Tender Procedures of the competent ministry.

The aim of the Electric Power Industry of Serbia is to increase energy safety and to diversify resources, to increase electricity supply safety and its more efficient use, to decrease adverse environmental impacts and to promote energy responsible behaviour.



### **Mini Hydro Power Plants**

In the project for construction and reconstruction of small hydro power plants, Elnos – Kessler consortium was selected for Lot 1 (Small Hydro Power Plant Zapad), and the contract was signed in August 2015. At the moment, electrical and mechanical equipment production approval is ongoing. Tender announcement for civil works in this power plant (Lot 2) is planned for September 2016.

Tender for Small Hydro Power Plant Istok (Lot 3) was announced for electrical and mechanical equipment and the tender evaluation is ongoing. A contract with independent engineer and expert for environmental protection was signed.

For the purpose of the clearest possible analysis of feasibility of construction of new generation capacities from renewable sources, activities on preparation of necessary investment and technical documentation, environmental impact assessment study, spatial plans and provision of technical opinions, consents and permits continued.

### **Wind Power**

For construction of wind farm in Kostolac with installed capacity of 30 MW a Feasibility Study is prepared with Basic Design. In November 2015, monitoring of birds and bats was finished and a study compliant with the European Union standards was prepared. Potential locations for construction of the wind farm in Kostolac basin are abandoned mining facilities and external overburden landfills created at the occasion of opening of open cast mines Cirikovac and Drmno, as well as spaces of closed open cast mines Cirikovac (2010) and Klenovnik (2009). The project is listed within the projects being developed within negotiations on development cooperation between the governments of Serbia and Germany held in the period 2011-2015.

### **Solar Energy**

Activities related to studies and basic designs for construction of solar power plant in Kostolac of up to 5 MW continued in 2015.



# Corporate Affairs



## HUMAN RESOURCES

As support function of the prevailing activity of Electric Power Industry of Serbia, human resources had a huge and responsible task of modifying in due time internal acts (new job descriptions, annexes to the employment contracts, regulation of employment-legal status of the employees with the new employer) according to the implemented status changes. EPS Human Resources fully responded to this challenge and were ready for subsequent steps in reorganization of the company that would be implemented during 2016.

In 2015, introduction of centralized SAP HR system as unified data base on employees in EPS Group was initiated.

Organizational management, staff administration, training of employees, recruitment and selection of

staff, time management and calculation of salaries and other benefits of employees would be integrated within the unified information system. Modules have been gradually implemented and, until the end of 2016, complete application of the software in all segments of human resources management is expected.

Preparation of corporate internal portal of EPS group, initiated in 2014, was finished within the scheduled deadline. In 2015 the portal became an important communication channel for employees.

For the first time, PE EPS participated in the Job Fair in 2015. EPS also signed agreements on cooperation with six faculties of Belgrade University enabling best students to have practice in EPS and prospect of employment. Thus the company confirmed its corpo-

rate social responsibility and gave a good example of cooperation between leading educational institutions and business.

15 vacancy announcements were published, out of which five external and 10 internal. The best quality candidates were selected through professional and transparent process.

Professional training of employees in Electric Power Industry of Serbia continued in 2015. Internal and external trainings, workshops, papers presented during the symposia, congresses, seminars and conferences, passed professional examinations and obtained licenses increased operational efficiency and

improved company business. It was also proved with the "360-Degree Assessment" project that included all HQ PE EPS managers. Beside the results of assessment by Hogan tools in 2014, the results obtained represent a basis for creation of individual plans for carrier development and training programs. For the high level management of EPS Group, meetings and trainings were organized for the purpose of introduction with all phases of restructuring and corporatization of the company.

Employee satisfaction survey in 2015 was responded by four percent more employees comparing to the previous year, and the results were published in the company's magazine "EPS Energy".



## Occupational Safety and Health

Electric Power Industry of Serbia pays special attention to the occupational safety and health, field with direct influence to the business but also with significantly wider social importance.

The entire specter of preventive measures is used in the system, and the greatest attention is paid to use of working equipment, means and equipment for personal protection at work, training of employees for safe and healthy work and provision of adequate working environment conditions. Regular maintenance of the equipment for operation and control of its use is of particular importance in EPS.

System of occupational safety and health may function adequately only if employees are included in an active and adequate manner. Therefore, training of employees for safe and healthy work is the most important aspect of the system. Due to timely informing, the awareness of employees related to the importance of occupational safety and health increases and their attitude toward this field improves. Programs for training of employees are often enlarged by additional trainings and training sessions, and 7.5 million dinars was spent for their realization in 2015.

Employee care reflects in monitoring their health condition. For the previous and periodical check-ups

of employees occupying high risk working positions, EPS allocated more than 118 million dinars in 2015. Although it has no obligation, the company also provided health protection for the rest of the employees that are not occupying the high risk working positions. This health protection includes oncological and gynecological examinations of specialists and regular check-ups. More than 57 million dinars were allocated for that purpose.

### Investments (in million dinars)

**930** - to create safe and healthy working conditions and for health protection of employees

**33** - for preventive and periodical examinations and for tests of the equipment for work and working environment conditions

**563.7** - for procurement of adequate means and equipment for personal protection

For employees with some kind of illness found, and based on recommendations of the competent medical institutions, EPS provided rehabilitation, occupational disability prevention or recreation programs through allocation of 151 million dinars for such purposes.





## Relations with Unions

EPS Union showed understanding for measures of reform of the Government of the Republic of Serbia, implying savings, convinced that implementation of such measures would promote and accelerate Serbian economic development and accordingly improve standard of living of employees.

Upon adoption of the PE EPS Reorganization Program at the end of 2014, RS Government and Union of EPS employees initiated negotiations and at the beginning of 2015, they concluded Separate Collective Agreement for the Electric Power Industry of Serbia. The Agreement which will be valid until 2018, replaces the former valid collective agreements with the employer and equalizes rights of the employees in the entire EPS Group. Interests and rights of the employees

are harmonized with the main objectives of transformation and financial consolidation of EPS Group.

Thus, the favorable environment has been created for status and structural changes improving business system efficiency of Electric Power Industry of Serbia and enhancing competitiveness in the open electricity market. The role of the Union has been defined and the basis for modification process implementation without conflicts with employees and their union organizations was established.

Traditional cooperation with unions in providing solidarity assistance to employees, in health protection and promotion of occupational safety, as well as in realization of sport and recreation programs continued in 2015.

## LEGAL AFFAIRS



### Status Changes Program

In accordance with the implementation of the conclusion of the Government of the Republic of Serbia, the reorganization program of Public Enterprise Electric Power Industry of Serbia was accepted on November 27<sup>th</sup>, 2014, and the status change of acquisition of seven subsidiaries (Hydro Power Plants Djerdap in Kladovo, Drinsko-Limske Hydro Power Plants in Bajina Basta, EPS Renewable Sources in Belgrade, Thermal Power Plants Nikola Tesla in Obrenovac, Thermal Power Plants and Open cast Mines Kostolac in Kostolac, Combined Heat and Power Plants Panonske in Novi Sad and Mine Basin Kolubara in Lazarevac) that as the companies transferors joined their parent controlling company Public Enterprise Electric Power Industry of Serbia Belgrade was conducted on July 01<sup>st</sup>, 2015.

Status change in distribution sector was conducted on the same date. Four subsidiaries for electricity distribution (Elektrovojvodina in Novi Sad, Elektrosrbija in Kraljevo, Jugoistok in Nis and Centar in Kragujevac) as the companies-transferors joined through the acquisition the Subsidiary for Electricity distribution Elektrodistribucija Beograd in Belgrade as the company acquirer.

As of July 01<sup>st</sup>, 2015, this subsidiary changed its business name into Distribution System Operator EPS Distribution in Belgrade.

In accordance with the conclusion of the Government the activity on establishment the ownership over the property used by PE EPS and its subsidiaries was determined as well. Ministry of Mining and Energy formed the work group for solving open issues regarding the establishment of property rights of public enterprises and for the preparation of the Governments act. Work group comprises of the representatives of competent ministry, ministry of economy, agriculture and environmental protection, finance and construction, transport and infrastructure and State Attorney's Office, Republic Directorate for Property, Republic Geodetic Authority and Electric Power Industry of Serbia. Task of the work group is to classify the property so that the ownership over them could be determined as public enterprises ownership and subsidiaries ownership and to prepare relevant act for the Government in accordance with the Law on Public Property.

Status change program for the acquisition of the Company for Electricity Supply of End Customers EPS Supply to PE EPS started on October 29<sup>th</sup>, 2015, under simplified procedure for the implementation of status change in accordance with Article 501 of the Company Law.

### **The Reorganization Program**

For the purpose of conducting the legal form change of Electric Power Industry of Serbia into Joint Stock Company, EPS expert team has been formed with the task to analyze and determine the conditions, procedures, manner and dynamics of the implementation of this key change of the company. This also includes the activities for the capital evaluation and determination of the basis and guidelines for the preparation of necessary acts and material within the legal form change procedure.

Legal form change procedure will be conducted the Government of RS adopting the act, by harmonizing the Articles of Incorporation and PE EPS Statute, by conversion of state capital into share capital and by appointment bodies for legal form of the joint stock company. During the first phase the only shareholder would be the republic and upon the analysis of market conditions the increase of

shareholder number would be provided, including the distribution of free shares to the titleholders in accordance with the law and the Government's decision.

Pursuant to the Company Law, by changing the legal form PE EPS continues to operate as the same legal entity in the form of joint stock company with the conversion of PE EPS fixed assets into the shares of EPS as a joint stock company.

### **Management System Improving**

Pursuant to the Law on Public Enterprises and by the decision on harmonization of business operation of public enterprise for electricity generation, distribution and trading with the Law on Public Enterprises and PE EPS Statute and on the proposal of PE EPS Director, on January 29<sup>th</sup>, 2015, the Supervisory Board appointed the Executive Board.

Organization and management in PE EPS are performed by PE EPS Director, Executive Directors, directors of branches and heads of organizational units according to the organization of operation and activities pursuant to the decision on the basis of internal organization and rulebook on organization and job systematization.



## INFORMATION-COMMUNICATION TECHNOLOGIES

Improvement of information-communication infrastructure is a significant support to the process of transformation and corporatization of Electric Power Industry of Serbia. ICT Department within Corporate Affairs of EPS performed a number of important tasks and activities in 2015.

Activity	Realization
Information-communication infrastructure improvement	For the purpose of easier and more advance e-communication in PE EPS system all employees in the company are unified through the unique and highly available domain and e-mail infrastructure. New telecommunication infrastructure for EPS Group was constructed and installed and the existing one was upgraded. Training and realization of the network control service are planned to be completed by the end of 2016.
Construction of unique corporate computer network	Unique corporate computer network of PE EPS was constructed and technologically upgraded and thus all facilities of PE EPS on the territory of the Republic of Serbia were connected into one computer network.
E-mail domains eps.rs and epsdistribucija.rs unification	E-mail domains eps.rs and epsdistribucija.rs are unified. All employees (whether from distribution activity or from PE EPS) got e-mail addresses in the appropriate form: name.surname@epsdistribucija.rs or name.surname@eps.rs
Construction of data center	Unified data center of PE EPS was constructed and virtualized. Complex information-communication infrastructure was consolidated at the central level of PE EPS, in the branches and technical centers at the territory of Serbia.
Implementation of SAP information system	SAP information system was implemented for distribution system operators and technical centers of PE EPS. This included the implementation of key business processes in the unique information system that is fully compliant with all aspects of EPS business operation.
Maintenance and development of the module of information system over ORACLE data base for PE EPS	Software applications for the monitoring of plan implementation and for property tax return were prepared.
Construction of PE EPS corporate telecommunication network	PE EPS corporate telecommunication network was constructed. PE EPS business premises in Belgrade, Novi Sad, Nis, Kragujevac and Kraljevo are connected via DWDM based network (Dense Wavelength Division Multiplexing).



Activity	Realization
Implementation of system for electricity bill printing and bill management	System for electricity bill printing and bill management was implemented. This represents a new consolidated system that is applied on the territory of Kragujevac and Kraljevo.
Implementation of E-service for the communication between Distribution System Operator - EPS Distribution and EPS Supply	E-service for the communication between distribution system operator and supplier at commercial and guaranteed supply was also implemented. System enabling the distribution system operators on the territory of Kraljevo and Kragujevac to read meters and to log-in/log-out meters at commercial and guaranteed supply has been put into operation.
Implementation of public procurement system	Public procurement system was implemented as well. It automates public procurement procedure for the sales to the customers - employers in terms of Public Procurement Law (commercial supply electricity sale agreements).
Implementation of corporate system for customer support	Implementation of corporate system for customer support and customer identity management system within PE EPS system was also initiated as the basis for the quality customer support and unique identification and authentication of all PE EPS employees. After preparatory activities, processes and users were defined and authentication methods were analyzed.
Integration of data centers infrastructure	Integration and consolidation of currently isolated data center infrastructure at branches and parts of EPS system into unique data center infrastructure have been initiated using DWDM/OTN transport system. Greater part of isolated infrastructure was integrated into unique infrastructure of PE EPS.
Cloud infrastructure implementation	Cloud infrastructure realized on Microsoft platform was fully implemented. Hybrid solution of private-public cloud was provided (Microsoft Azure-HyperV-ADFS) as the basis for business operation processes corporatization and implementation of corporate internal/external service, such as system for unified communications.

## INTEGRATED MANAGEMENT SYSTEM



Operation of Electric Power Industry of Serbia is based on the effective and efficient integrated management system according to ISO standard requirements and quality infrastructure as well, i.e. application of the requirements of legal and technical regulations.

Activities performed within IMS field during 2015 enabled the continuation of management system certificates in EPS Group and undisturbed continuation of new management system implementation.

Effective and efficient integrated management system enables an adequate management tool for timely adjustment of the company to the market and requirements of the international institutions and competent state bodies. In addition to quality infrastructure, i.e. application of the requirements of legal and technical regulations, the guidelines for profitable and good business practice within EPS Group are given.

Processes within PE EPS are continuously improved by consistent application and improvement of the system in accordance with new edition of ISO 9001 standard.

Realized activities in 2015 are the following:

- Preparation of the strategy for integrated management systems improvements as an integral part of EPS Group strategy;
- Determination of the manner of functioning of management system and accreditation in EPS Group after status change;
- Agreement with certifying bodies that issued the certificates for management systems in EPS Group regarding the manner of keeping the certificates valid taking into account the status change and following the certification rules as well;
- Unification and transfer of certificates on accreditation of control bodies for certification of electricity meters in DSO EPS Distribution and in cooperation with competent Ministry of Economy – Sector for Quality Infrastructure, Accreditation Body of Serbia and Directorate for Measures and Precious Metals;
- Manner of harmonization of the management systems of control bodies and laboratories in former subsidiaries for electricity distribution and generation was defined together with Accreditation Body of Serbia given the status change and following accreditation rules;

- Defining the organization model and of IMS functioning method within EPS Group;
- Analysis and harmonization of PE EPS quality policy after conducted status change;
- Analysis and harmonization of occupational health and safety policy with accompanying occupational health and safety rules;
- Preparation of component policies regarding the safety of information together with the competent sector. This is the first step in the implementation of information safety management system according to the requirements of the international ISO/IEC 27001 standard;
- Preparation of the first set of mandatory documents at the level of entire EPS Group. Documents for the organization of procurement processes and part of HR management processes were prepared together with the competent organizational units;
- Continuation of activities on harmonization of other processes and procedures at the level of EPS Group in respect to the status change;
- Implementation of Terms of Reference for the preparation of the corporate rules of procedure of integrated management system and set of joint procedures was initiated. Project included the harmonization and improvement of the requirements that refer to the aims, policies, standardization of aspect evaluation criteria, communication between organizational parts of EPS Group and identical access to the legislation and by-laws;
- Migration of intranet portal ELISO to the new version;
- Quality management system testing and successful supervision in PE EPS HQ.

Applied integrated management system model in EPS Group, initially based on the requirements of ISO 9001, is open for the implementation of other management systems significant for the company's business operation improvement. Thus, implementation of energy management system according to ISO 50001 and information security management system according to ISO 27001 was continued taking into account the application of risk management system basic rules and principles according to ISO 31000 with the aim of achieving the sustainable success.

IMS department actively participated in the work of expert teams appointed by Director of PE EPS, on

the tasks regarding the status change and on the following projects:

- Unbundling process – transformation of distribution system operator and supplier;
- Implementation of the procedure of verifying amended technical characteristics of power facilities and generation units in the branches of PE EPS for electricity generation;
- Stakeholder Engagement Plan at EPS corporate level (SEP) and Environmental and Social Action Plan (ESAP);
- Diagnostic center operation organization (remote control and diagnostics, data base - updating, use).

Quality infrastructure activities were particularly significant in 2015. Requirements of technical regulation of the Republic of Serbia are being successfully implemented in the large projects for the preparation of the construction of power entities. Conditions for systematic approach for quality infrastructure activities within PE EPS were created enabling thus systematic fulfillment of all requirements within the field of infrastructure: accreditation, metrology, standardization and compliance evaluation.

Quality infrastructure activities that were realized are the following:

- Phase II of packet-project TPP Kostolac B3;
- Preparation of technical specifications for "Third Party Inspection" for the purpose of the fabrication of the equipment necessary for the construction of TPP Kostolac B3 and expansion of OCM Drmno;
- Together with the Faculty of Mechanical Engineering of the University of Belgrade four two-day long instructional seminars on the topic quality infrastructure were held at Belgrade Chamber of Commerce. Seminars covering all business activities of PE EPS were held for the employees of competent organizational units in PE EPS.

IMS department coordinated the operation of all organizational units responsible for the integrated management systems within EPS Group and participated in the regular exchange of experience and information achieving the high level of cooperation within EPS Group.

In 2015 the eminent certifying houses confirmed stability and evident improvement of integrated management system within EPS Group.

Integrated Management Systems						
	QMS	EMS	OHSAS	ISMS	EnMS	Laboratory / Control Body
PE EPS	2008/TS 2011/TS 2014/TS 2017/TUV SUD	Ongoing project	Ongoing project			

Coal production and electricity generation	QMS	EMS	OHSAS	ISMS	EnMS	Laboratory / Control Body
HPPs Djerdap	2005/SGS 2014/SGS	2008/SGS 2014/SGS	2011/SGS 2014/SGS	2013/SGS		
HPPs Drinsko-Limske	2009/SGS 2012/SGS 2015/SGS	2009/SGS 2012/SGS 2015/SGS	2009/SGS 2012/SGS 2015/SGS	2011/SGS 2014/SGS		
TPPs Nikola Tesla	2005/SGS 2008/SGS 2011/SGS 2014/SGS	2008/SGS 2011/SGS 2014/SGS	2010/SGS 2013/SGS		Ongoing implementation	
MB Kolubara	2009/BV 2012/BV 2015/BV	2009/BV 2012/BV 2015/BV	2010/BV 2013/BV 2015/BV			Prerada Vreoci – Coal and Waste Water Testing Center: 2008/ATS, 2012/ATS and 2016/ATS  OCM Barosevac, Branch Tamnava-East Field, Coal Preparation, Coal Quality Control, Laboratory Tamnava: 2010/ATS and 2014/ATS  OCM Barosevac, Expert Operations Center, Production and Technical Operations Department, Electrical Works Division, Office for Investigation and Control of Laboratory for Investigation According to the Standard SRPS ISO/IEC 17025 and 2014/ATS  Control bodies according to standard SRPS ISO/IEC 17020:2012 and 2013/ATS
MB Kolubara Kolubara Metal	2002/ISS 2004/TS 2007/TS 2010/TS 2013/TT	2012/TT 2015/BV (unique certification with MB Kolubara)	2012/TT 2015/BV (unique certification with MB Kolubara)			Laboratory Kolubara Metal (defining center of gravity of minig devices, vibrodiagnostics and testings of springs for railways 2009/ATS; 2014/ATS  Method accreditation is being prepared: materials testing and non-destructive testing of welded joints (ultrasound, magnetic flux, penetrants)  *Certificates in the field of production of steel structures and welding jobs management: EN ISO 3834-2 2011/TT; 2014/TT DIN 18800-7 2004/SLV; 2007/SLV; 2011/TT  From Din 18800-7 to: EN 1090-1 2014/ TT and EN 1090-2 2014/TT
TPPs-OCMs Kostolac	2006/SGS 2009/SGS 2012/SGS 2015/SGS	2011/SGS 2014/SGS	2012/SGS 2015/SGS		2016/SGS	Preparation for accreditation of laboratory for testing the quality of waste, surface and underground water and testing of ambient air quality according to ISO 17025
Panonske CHPs	2002/SZS 2008/TS 2011/BV 2014/LRQA	2008/TS 2011/BV 2014/LRQA	2010/SGS 2011/BV 2014/LRQA		2014/LRQA	

Integrated Management Systems						
Electricity distribution	QMS	EMS	OHSAS	ISMS	EnMS	Laboratory / Control Body
Novi Sad	1998/QS/SZS SGS/TR 2013/Ct	2013/Ct	2013/Ct	Ongoing project		2014/ATS Accredited control body for meters according to SRPS ISO/IEC 17020:2012
Belgrade	2001/QS/SZS 2011/QMS/Ct 2014/QMS/Ct	2010/Ct 2013/Ct	2012/Ct	2012/Ct		2012/ATS Accredited control body for meters according to SRPS ISO/IEC 17020, according to new standard SRPS ISO/IEC 17020:2012 obtained. a new certification on 10.12.2014.
Kraljevo	2006/TS 2012/SGS 2015/SGS	2007/TS,SGS 2011/SGS 2014/Ct 2015/SGS	2009/TS,SGS 2012/SGS 2015/SGS			2015/ATS Accredited control body for meters according to SRPS ISO/IEC 17020: (unique accreditation for DSO)
Nis	2005/TS 2010/SGS 2013/Ct	2010/SGS 2013/Ct	2010/SGS 2013/Ct			2012/ATS Accredited control body for meters according to SRPS ISO/IEC 17020. In november 2013, the authorization on certification of eletricity meters was obtained. Unique registration number OM 068. In 2014, control body was accredited to the standard SRPS ISO/IEC 17020:2012
Kragujevac	2001/QS/SZS 2008/TS 2011/SGS 2014/SGS	2008/TS 2011/SGS 2014/SGS	2008/TS 2011/SGS 2014/SGS			2012/ATS Accredited control body for meters according to SRPS ISO/IEC 17020

#### Legend:

QS	Quality System
QMS	Quality Management System ISO 9001
EMS	Environment Management System ISO 14001
OHSAS	Occupational Health and Safety Management System BS OHSAS 18001
IMS	Integrated Management System
ISMS	Information Security Management Systems ISO 27001
EnMS	Management System ISO 50001
EN ISO 3834-2	General requirements for quality management for welding works
DIN 18800-7; Klasse E	Due to issuance of new standard transfer to: EN 1090-1; EN 1090-2; EXC 4; The ability of the company for designing, production, corrosion protection and installation of steel structures of the highest class of performance (class 4); including factory control system

\* Certificates in the field of production of steel structures and welding jobs management

#### Certified Bodies:

ISS	Institute for Standardization of Serbia
SGS	Societe Generale de Surveillance
TS	TUV SUD
Ct	Certop
BV	Bureau Veritas
TR	TUV Rheinland
ATS	Accreditation Body of Serbia
TT	TÜV Thüringen
SLV	München
LRQA	Lloyd's Register

## GENERAL AFFAIRS



In 2015, General Affairs Department unified the data, within its scope of work, for preparation of the plan for procurement of goods, services and works for 2016. Thus, funds on PE EPS corporative level are efficiently and cost-effectively used, positions of the procurement plan are merged and their total number is reduced.

Planning and organization of office and archive operations were among the first steps in EPS reorganization process. On the very first day of implemented status reforms, July 01<sup>st</sup>, 2015, unique records office for the entire PE EPS started working.

On 33 locations of EPS records office, almost 90 registrars' process and archive documents in a unique manner, using unified application for e-records office.

Office operations are uniformed on Oracle platform in Distribution System Operator - EPS Distribution. 216 registrars have been trained by Oracle instructors, supported by EPS' work group for e-records office implementation, at all 85 DSO locations in Serbia. Office operations quality in EPS is raised to a new level by using centralized application for e-records office.

List of registry material from PE EPS' archive whose retention period, according to the category list of registry material with retention period, expired, was made. The Council of Archive of Serbia gave consent to category list of registry material with retention period in PE EPS prepared after status change on July 01<sup>st</sup>, 2015.

Transport division reorganized the operation of vehicle fleet and effects were immediately visible. Fuel consumption and mileage were reduced, and total

number of vehicles in PE EPS was reduced by 311. Operation of transport office in branches was organized and biannual work plan of transport division was made with the aim of reducing cost of vehicles' maintenance and registration. 400 vehicles from the fleet are planned to be sold.

More intensive supervision (physical and technical) of the facility security reduced the number of

incidents. PE EPS emergency measures plan was harmonized with the emergency measures plan from the Emergency Protection and Rescue Plan of the Republic of Serbia. Attendance of the employees at work is constantly and precisely being recorded, business premises are being monitored and adequate care is provided all in accordance with the principles of security risks management and integrated management system.



# Public Relations



In 2015, the most significant activities of PE EPS were carried out with communication support by Public Relations Department, thus the customers and entire public were fully and timely informed about the company's activities by media and other communication channels. Communication priorities were the continuation of recovery from floods at open cast mines, successful finalization of revitalization and construction of some units in power plants, as well as the important activities regarding the Chinese arrangement that will provide new production capacities for Serbian energy sector.

However, the reorganization of Electric Power Industry of Serbia received the greatest attention.

These historical changes in their structure and scope required precise, clear and constant communication that provided adequate information about this complex and long-term process to interested public, both the internal and external. When it comes to employees the company management had to invest additional efforts. Visits to the subsidiaries undergoing the status change were organized. Face to face meetings emphasized the unity in the implementation of changes and all necessary and possible improvements were discussed. Communication with external public was realized at press conferences and professional conferences and conventions, where both EPS representatives and independent experts in energy sector took participation.



Company magazine “kWh” played important role in the overall process. In July 2015, its name was changed into “EPS Energy” – joint corporate magazine of the entire company. Following the example of reorganization of entire company, this media unified mining, electricity generation, and distribution and customers relations, emphasizing the most important topic, i.e. employees. This magazine unifies the information about EPS business operations, current affairs in all parts of the company, as well as the interviews with eminent experts within economic sector, professors and representatives of international energy associations and broader professional public. Their opinions about reforms in energy sector, market liberalization, EPS position and its further development were presented.

Since “EPS Energy” is a monthly magazine, employees also need a faster way of getting the news from the company. Public Relations Department published almost 300 reports from all former EPS subsidiaries and branches using e-service “E-info”. It provided for daily and reliable information exchange, which is of utmost importance for large systems such as EPS. Also, official website of Electric Power Industry of Serbia was regularly updated.

Fast and efficient communication with the media has become particularly important with the occurrence of modern technologies and the changes in journalists’ job. Media representatives are particularly important for the company, since they are the key link between EPS and public. Therefore, EPS constantly strived to answer every question, provide timely and precise information and promote mutual cooperation for the purpose of creating the best possible company image in the public. Also, in the events



when the reports about the company were biased and were coming from unverified sources, Public Relations Department always responded with prepared answers and pointed to the truth with arguments and facts.

The importance of EPS to citizens and therefore to the media proves the fact that in 2015 even 9,208 articles and reports were published in the press and electronic media. Most reports were informative and affirmative. If we look at the most common topics, they lead to the confirmation of importance of EPS restructuring, as well as the electricity price, business results, etc.

As the result of good cooperation with “the Fourth Estate”, Public Relations Department received an award from Pragma agency since EPS was selected among all public enterprises for the award for the best media relations in 2015. Accordingly, PR Department had a good communication also with the Ministry of Energy, Energy Agency of the Republic of Serbia, political and professional public and customers’ associations on a regular basis.

As inevitably large part of the society in which it operates, EPS is also an important factor for the improvement of the quality of community life. With the same dedication it uses for stable and safe electricity supply to the customers, EPS also supports the improvement of the community in all fields – from science, education, health, culture, sport and preservation of religious buildings, to the humanitarian activities. In 2015, professional conferences organization, science projects implementation as well as educational and cultural institutions were supported. When it comes to donations for medical assistance, both institutions of national importance and natural persons could have relied on EPS for help. The best example of long-term project is equipping so-called sensory rooms in homes for people with special needs (“Dragutin Filipovic Jusa” in Belgrade, “Veternik” in Novi Sad, “Kulina” near Nis, the Foundation for Children and Youth in Sabac), as well as continued cooperation with UNICEF for the project for proper development of children in early childhood. EPS also supported the following projects: Science Camp Viminacium and Eco-camp Vrsacki breg; and in the International Year of Light it also supported Science Festival.

## IMPRESSUM

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