

## Standard Summary Project Fiche – IPA centralised programmes

### **Project Number 16: Construction of Waste Water Treatment Facilities**

#### **1. BASIC INFORMATION:**

- 1.1 CRIS Number:** 2011/022-585
- 1.2 Title:** Construction of Waste Water Treatment Facilities
- 1.3 ELARG Statistical Code:** 03.27 European standards. Environment
- 1.4 Location:** Republic of Serbia

#### **Implementation arrangements:**

- 1.5 Contracting Authority:** EU Delegation to the Republic of Serbia
- 1.6 Implementing Agency:** EU Delegation to the Republic of Serbia
- 1.7 Beneficiary (Including Details of Project Manager):**

Public Enterprise "Electric Power Industry of Serbia"

Public Enterprise "Electric power industry of Serbia" (hereinafter: EPS) was established by Decision of the Government of Serbia, which entered into force on 1 July 2005. Basic task of EPS represents meeting all the electric power requirements of the economy and inhabitants of the Republic of Serbia including the following activities: electric power generation, electric power distribution and distribution system management, electric power trade, coal production, processing and transport, steam and hot water production in combined heating processes, water power utilisation and services in river and lake traffic, wholesale trade in fuel and similar products, research and development; design, construction and maintenance of energy and mining plants, design, construction and operation of telecommunication facilities and engineering. Ownership structure: 100% ownership of the Republic of Serbia.

Project manager: Mihajlo Gavrić, Manager of the Environmental Protection Sector, Electric Power Industry of Serbia (EPS).

Ministry of Energy and Mining will be responsible for the implementation of the project and chairing the Steering Committee meetings.

The Senior Project Officer (SPO) will be Nikola Rajaković, State Secretary in the Ministry of Mining and Energy of Republic of Serbia (hereinafter: MME).

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Steering Committee will be formed and chaired by the SPO, State Secretary Nikola Rajaković. It will consist of approximately 6 members. In the absence of the SPO it will be chaired by the Project manager of EPS and will include representatives of the EU Delegation and other stakeholders such as the Ministry of Environment, Ministry of Finance etc.

### **Financing:**

<b>1.8 Overall Cost:</b>	EUR 20 million
<b>1.9 EU Contribution:</b>	EUR 15 million
<b>1.10 Final date for contracting:</b>	2 years after the signature of the Financing Agreement (FA)
<b>1.11 Final Date for execution of contracts:</b>	4 years after the signature of the FA
<b>1.12 Final date for disbursements:</b>	5 years after the signature of the FA

## **2. OVERALL OBJECTIVE AND PROJECT PURPOSE**

### **2.1 Overall Objective:**

To contribute to improvement of environment in town of Obrenovac, as well as in Belgrade city (situated on the Sava River).

### **2.2 Project Purpose:**

To assist the Public Enterprise “Electric Power Industry of Serbia” improve water and soil quality by construction of Waste Water Treatment Facility at TPP Nikola Tesla B.

### **2.3 Link with AP/ NPAA / EP/ SAA**

This project is strongly linked with the following EU strategic documents:

**The European partnership from February 2008** (*Title: Sectoral policies, subtitle: Energy*) sets out the sectoral short-term priorities such as:

- Fulfilling the obligations arising from the Energy Community Treaty as regards the full implementation of the *Acquis on environment*.
- Continue environmental audits on energy plants, addressing the worst polluters

**The Stabilization and Association Agreement** (*Title VIII, Cooperation policies, Article 109 – Energy*) states that cooperation shall focus on priority areas related to the European Union *acquis* in the field of energy and be based on the Treaty establishing the Energy Community, with a view to the gradual integration of Serbia into Europe's energy markets. Cooperation may include the:

- a) The formulation and planning of energy policy, including modernisation of infrastructure;
- b) The formulation of framework conditions for restructuring of energy companies and cooperation between undertakings in this sector.

**The Stabilization and Association Agreement** (*Title VIII, Cooperation policies, Article 111 Environment*) refers to the following:

“The Parties shall develop and strengthen their *cooperation in the environmental field with the vital task of halting further degradation and start improving the environmental situation* with the aim of sustainable development”.

“The parties shall, in particular, establish cooperation with the aim of strengthening administrative structures and procedures to ensure strategic planning of environment issues and coordination between relevant actors and shall *focus on the alignment of Serbia’s legislation to the EU acquis*. Cooperation could also centre on the development of strategies to significantly reduce local, regional and trans-boundary air and water pollution, to establish a framework for efficient, clean, sustainable and renewable production and consumption of energy, and to execute environmental impact assessment and strategic environmental assessment. Special attention shall be paid to the implementation of the Kyoto Protocol.

According to the Serbia Progress Report 2010, there has been progress on **water quality**. A new law on water was adopted. Water management is to be financed by the national and the Vojvodina provincial budget, as well as by water fees, concession fees and other funds. Dissuasive water pollution fees are to be paid to the Environmental Protection Fund and to be used for the construction of waste water treatment plants. However, there is still no system to monitor nitrate concentrations in and contamination of groundwater. The wastewater treatment infrastructure throughout the country needs upgrading. The Water Directorate within the Ministry of Agriculture, Forestry and Water Management remains to be strengthened. The administrative capacity of the water directorate was reduced.

**The Energy Community Treaty** signed multilaterally by the EU Commission and Balkan countries including Republic of Serbia introduces the legal requirement for Serbia to implement the *Acquis* on the Environment. Annex II of the Treaty sets the deadline of 31 December 2017 for implementation of Directive 2001/80/EC (The Large Combustion Plant Directive).

#### **2.4 Link with 2011-2013 MIPD for Serbia**

The project Construction of Waste Water Treatment Facilities falls under the Environment and Energy sector and addresses its objectives to improve the environmental infrastructure, strengthen regional and cross-border cooperation, and contribute to EU 2020 targets in energy and climate change.

Environment and Energy are key for Serbia but also for its neighbouring countries within and outside the EU. Serbia is the most industrialised country among potential candidates and has a key geopolitical role in energy, both for the region and for the EU overall. Support to this area in Serbia has a direct, potentially substantial impact in helping the EU meeting its 2020 targets in Climate Change and Energy. It also has an indirect impact on production, employment and living conditions.

**In the MIPD 2011-2013** (*Sector 1.1 Purpose*) - The global objective of EU financial assistance to Serbia is to support its efforts for reform and towards compliance with the EU

acquis in order that it may become fully prepared to assume the obligations of Membership to the European Union.

**In the MIPD 2011-2013 Environment and Energy** (*Section 6.3 Sector Objectives for EU support over next three years*) -

- Ensuring progressive approximation of EU legislation, implementing international conventions and the **Kyoto Protocol** relating to climate change and energy, and production of implementation plans for selected heavy investment directives;
- Strengthening further the capacity of environmental institutions at national and local levels, and raising awareness of the importance of environmental protection;
- Developing and adopting a Strategy for **Water Management**;
- Implementing fully the National Programme for Environmental Protection and **Waste Management** Strategy, including financing the multi-annual plan for infrastructure development.

Continue working on GHG inventory. Carry out further analysis to assess GHG mitigation potential

Prepare the next national Communication under UNFCCC

Decide which EU acquis form the area of climate change needs to be transposed/implemented in the first step

Start preparation for implementation of the climate and energy package.

To maintain adequate pressure for the setting-up of robust regulatory and anti-monopoly frameworks, to sustain commitments related to transparency, free entrance access to networks and storage facilities.

- **Reduce environmental problems in energy sector and implement a long-term strategy for an environmentally sustainable energy policy**
- Increase the administrative capacity of the sector

**In the MIPD 2011-2013 Environment and Energy** (*Sector 6.4 Planned activities and expected results*) -

- Further *acquis* harmonisation relating to environment, including climate change and energy directives; More effective authorities at the central, provincial and local levels for planning, issuing permits and inspection, and full implementation of EIA, SEA and IPPC instruments;
- Constructing a national facility for the treatment and safe disposal of **hazardous waste**;
- **Constructing regional waste management centres and wastewater treatment facilities serving Serbian citizens and businesses**; and
- Reducing noxious air emissions by installation of electrostatic precipitators at thermal power plants.

## 2.5 Link with National Development Plan

N/A

## 2.6 Link with National/Sectoral Investment Plans

The project is in accordance with all of the following strategic National documents:

**The amended National Program for Integration of Republic of Serbia into European Union– - NPI from December 2009** (refer to 3.27.7. *Control of Industrial Pollution and Risk Management*. pages: 588-591) highlights:

- EU legislative and institutional framework in control of industrial pollution and risk management;
- Serbian priorities in control of industrial pollution and risk management for years 2010, 2011 and 2012 in legislation and institutional framework.

“The strategic actions in the energy and electric power sector are defined in three documents: ***Energy Law, Energy Sector Development Strategy to 2015 year and Strategy Implementation Programme***.

**Energy Development Strategy of the Republic of Serbia by 2015** (refer to page 9)

**Energy Law** (“*The Official Gazette RS*”, No. 84/2004, Article 4) specifies that the “Energy Policy of Republic of Serbia comprise measures and activities to be undertaken for implementation of long-run objectives and specifically includes energy infrastructure development and introduction of contemporary technologies”.

**The Programme of Energy Development Strategy Implementation of the Republic of Serbia by 2015 for the period from 2007 to 2012** (page 16) highlights:

*The continuity of technological modernization of existing energy facilities / system / sources in the electricity sector and construction of new energy and electricity infrastructure facilities* especially fall into the first and fifth long-run development and regionally strategic priorities of Republic of Serbia Energy Strategy that need to be met by 2015.

**In the Energy Strategy Action Programme 2009-2015** (Section 8.5 - *Dynamics of new electro-electrical facilities until 2012*), one of priority is as following: “the ***construction of new and reconstruction and upgrading of existing distributive electro-electrical facilities***”.

**Energy Strategy Action Programme 2009-2015** (section 9.2.1 - *Overview of Capital investments*) is specified that the largest investments in the forthcoming 10 years will be dedicated to rehabilitation and upgrading of existing electricity transmission system.

- **National Environmental Programme of the Republic of Serbia** (refer to page 66).
- **Mid-Term Development Plan of 2008-2015** (*Environmental Protection Sector–Water Protection – refer to point 2.*)

### **3. DESCRIPTION OF PROJECT**

#### **3.1 Background and Justification**

During the last decade of the twentieth century, Serbia had many problems as social-economic setbacks, isolation and difficult inheritance that resulted in Serbia not being able to address environmental issues to the extent necessary. As the country emerges from this period, fresh

attention is being given to the protection of environment so that technical and energy-related development assumes a cleaner nature than hitherto. The Electric Power Industry of Serbia has a great impact on the natural state of environment with its activities such as: natural resources, coal and hydro potential to generation, transmission and distribution of electricity. Thermal power facilities are doubtlessly the biggest polluters of air and substantial polluter to water, compared to other plants and facilities within EPS. In accordance with the Serbian policy of association and harmonisation with the EU and its standards, EPS decided to give its first priority respecting EU environmental standards.

TPP Nikola Tesla B (hereinafter: TENT B) is located 59 km upstream from the capital of Serbia -Belgrade and upstream from Belgrade's potable water spring Makiš. It is about 12 km upstream from TPP Nikola Tesla A. TENT B consists of two units, with a total installed capacity of 1,240 MW (2x620 MW). In the previous period, units have been engaged for over 7,500 hours annually. The wastewater outlets from TENT B to the River Sava are located within the sanitary protection zone of potable water springs supplying Belgrade.

There have been almost no investments in environment protection for many years due to crisis in the Former Republic of Yugoslavia and later in Republic of Serbia. In the past several years, harmonisation process of domestic legislation with EU regulations has been intensified. One of the segments of this process is related to water protection measures by reducing harmful substances emission, pursuant to the Law on Integrated Pollution Prevention and Control (IPPC, 'Official Gazette RS', № 135/04).

After the adoption of a set of environmental laws in Serbia, which became effective in the end of 2004 and 2009 ('Official Gazette RS', № 135/04 and 36/09) and after adoption of Law on Ratification of the Energy Community Treaty, EPS is under obligation to align the operation of its thermal power plants in terms of harmful substances emission into waters, with the provisions of these laws by the end of 2015.

One of the conditions for obtaining an integrated permit (under IPPC) for further operation of thermal power plants and performance of activities after 2015, in accordance with the IPPC Law is alignment of emission and introduction of best available techniques (BAT) for water emission reduction. In accordance with the above, Waste Water Treatment Plant (hereinafter: WWTP) should be constructed up to the level, which has to be in accordance with EU regulations.

The projects for construction of WWTP are proposed by the Ministry of Mining and Energy with the main beneficiary being EPS. This project is the most recent phase of an integrated programme to construct wastewaters treatment facility at TPP Nikola Tesla B.

TENT B is obliged to obtain an integrated operation permit in accordance with the Law on Integrated Pollution Prevention and Control by 2015. TPP plant managers are in regular contact with the environmental enforcement agencies, and all proposals are discussed and negotiated with them.

Prior to constructing the WWTP for TPP TENT B, Concept Design, Feasibility Study with Basic Design and Environmental Impact Assessment Study (EIA) of Waste water Treatment will be finalised in the course of 2010 and 2011 and funded by EPS.

A water balance and proposed solutions for waste water treatment have been done under the study - Wastewater Balancing of EPS TPPs – Nikola Tesla A and B. Wastewaters created in the course of electricity generation must be prior to discharge to natural water. The treatment must address oily waters, atmospheric waters containing oil and oil derivatives (heavy oil), as well as wastewaters to be created by flue gas desulphurisation (FGD), via wet limestone process.

The new facility will provide wastewater treatment under all necessary technical – technological and economic parameters, while analysis of the construction and technological options will be examined under the feasibility study.

Construction of the facility will reduce the amount of harmful substances discharged into River Sava. Commissioning of a new FGD plant at TPP TENT B will begin after the construction and commissioning of the WWTP.

Based on obligations regulations, regular annual controls of wastewater quality are performed, while EPS is in charge for their implementation. Controls are executed in accordance with the comprehensive environmental Programme. Annual reports on the above measurements may be found in EPS.

Republic Hydro-Meteorological Service of Serbia (hereinafter: RHMZ) in Belgrade performs monitoring and measurements of water quality in accordance with legislative act of Republic of Serbia.

After the construction and commissioning of the WWTP at TPP Nikola Tesla B, regular implementation of the control programme will be continued, whereas the existing results will represent the zero state and they will be used to analyse positive effects anticipated after the construction of wastewater treatment plant. This facility is the most recent phase in EPS comprehensive environmental programme. Discharges to surface waters will meet the limit levels set out in the new Water Law. The next phase in the programme will be to address contamination of ground waters arising from the disposal of ash and slag.

### **3.2 Assessment of Project Impact, Catalytic Effect, Sustainability and Cross Border Impact**

After the construction of WWTP at TPP TENT B with the necessary ancillary facilities, the concentration of relevant parameters (mineral oils, suspended solids, heavy metals, BOD), at the facility outlet will be in accordance with EU directives, leading to an improvement in water quality around the TPP.

The health of the population will begin to improve, with all direct and indirect effects: reduction of health costs, both curative and preventive for all levels and age groups of population; increased efficiency of the working population and improved economy of the affected areas.

It is difficult to enforce environmental legislation in the private sector when the bulk of pollution is the responsibility of state owned EPS. When EPS cleans up its operations, general enforcement will be easier to implement and better justified.

The Government Memorandum on the 2010 budget, with projections for 2011, shows that the Government of Serbia commits itself to undertake gradual annual tariff adjustments in order to reach cost-recovering tariffs for electricity in compliance with European levels, thus allowing EPS to raise finance for investment in environment projects. The current round of investments through donor financing should therefore represent a one-off improvement to bring the Serbian power generating capacity to a point where sustainable further development is possible without subsidy or further donor intervention. The Environment Impact Assessment (hereinafter: EIA) will be conducted and approved and various planning and construction permits will be obtained once the appropriate technological solution has been chosen and approved.

The Concept design (funded by EPS) for construction of WWTP at TPP TENT B has not been completed yet, although the outline concept design, the Study of Balancing of Wastewater at

TPP Nikola Tesla B, has proposed conceptual solution (proposal). The Preliminary design and Feasibility Study (funded by EPS) for WWTP should be produced by the end of March 2011.

The EIA (funded by EPS) for TPP Nikola Tesla B is planned to be completed in March 2011. The EIA needs to be conducted in line with EU standards.

Technical requirements / Functional specifications and the Tender Dossier (funded by EUD) for TPP Nikola Tesla B is planned to be produced by September 2011 through a separate framework contract (07SER01/37341, IPA 2007 budget) on the basis of the above listed documentation whose preparation is funded by EPS. The Technical requirements (approved by Beneficiary) will serve as an input for the works contractor to prepare the Detailed Design.

Official inspection and approval of the Detailed Design shall be performed according to the Construction Law and shall be organized by the Beneficiary, who will obtain all necessary permits for execution of works, and is responsible for necessary expropriations and reallocation of utilities.

The proposals that form the basis for this project have been scrutinised by the Ministry of Environment Protection and Spatial Planning.

Through harmonization and approximation of Serbian legislation to EU legislation, far greater attention will in future be given to potentially hazardous substances, and avoiding a repeat of the present situation will become a mainstream task of energy producers and environmental agencies alike.

After introduction of this new technology, River Sava water quality control will be continued, as well as ground water around the ash disposal site, for the purpose of considering the effects of applied technology.

### **3.3 Results and Measurable Indicators**

**Result 1:** Constructed and commissioned Wastewater Treatment Facility at TPP Nikola Tesla B

**Measurable indicators:**

- Construction of wastewater treatment facility at TPP Nikola Tesla B completed;
- Measured concentration values (mineral oils, suspended solids, heavy metals, BOD) at the outlet from the waste water treatment facility in accordance with EU directives, leading to an improvement in water quality around the TPP.

**Result 2:** Handover of projects following supervision of works and commissioning of Facility

**Measurable indicators:**

- Minutes on facility acceptance;
- Certificate on facility operation efficiency

### **3.4 Activities:**

**Activity 1:** Works contract (one Lot) for construction under FIDIC rules: Design, construction, trial operation and commissioning of WWTP at TPP Nikola B with use of FIDIC rules (Plant and Design-Build – Yellow Book);



**Activity 2:** One service contract: Supervision of construction and commissioning of the new WWTP at TPP Nikola Tesla B.

### **3.5 Conditionality and Sequencing**

It will be a condition that the Preliminary Design is prepared by the beneficiary by end of March 2011 and technical requirements / functional specifications by September 2011 (prepared by EUD through special Framework Contract from IPA 2007). Implementation of the works will be overseen by a qualified supervising engineer. For operational reasons (the need to operate the power plants during the peak winter period) works to replace the ESPs must be undertaken during the planned plant shutdown periods. Activities, which are to be provided by EPS as part of national co-financing, are listed in Annex VI.

Decommissioning of existing and construction of the new system for wastewater collection and transport up to the interceptor, as well as the installation of equipment for wastewater treatment plant will be executed in the course of overhauls – unit downtime. The above works will be done according to the annual overhaul plan.

### **3.6 Linked Activities**

From year 2000 EPS has taken a series of actions aimed at the improvement of operation of thermal units, as well as availability and reliability increase of units in operation.

By 2004 within the capital overhaul and regular overhauls, special attention was paid to ESP, with the purpose to bring the existing ESP after ten-year operation to the maximum reliability level within the existing technologies. From 2004 alignment of EPS operation with legal regulations was started.

Other projects were also launched related to environment improvement around the TPP and on a broader level:

- Capital overhauls of units A3 TPP Nikola Tesla A, reconstruction of EPS (64.5 MEUR from CARDS 2002)
- Study of pollution from thermal power stations in Serbia and on pollution mitigation measures and their costs (0.75 MEUR from CARDS 2003)
- Reconstruction of Unit A1, A2, A4 and A5 EPS, TPP Nikola Tesla A between 2004-2007 (58 MEUR)
- Reconstruction of Unit A2, EPS, TPP Kostolac A, year 2006, financed by EAR (5 MEUR).
- Ash handling system reconstruction with the thick slurry system at TPP Nikola Tesla B, through which reduction of ash dispersion from the ash pit will be achieved. Project ends in August 2010. It is financed by EU (28 MEUR).
- Emission reduction from Nikola Tesla Thermal Power Plant Obrenovac, Unit A6 and Unit B2 (12MEUR from IPA 2007 for works and supervision of the works). Project is ongoing.

### **3.7 Lessons Learned**

Experience on reconstruction executed so far has shown that equipment delivery period from abroad was prolonged; having an impact on the completion of the planned reconstruction implemented during overhauls, whose beginning and duration period is limited during the year. This is the reason why the tenders for equipment procurement and delivery necessary for the reconstruction should be planned earlier, since equipment comes from abroad.

Participation of local companies in the reconstruction was assessed as positive and they have demonstrated their technical ability to carry out the reconstruction to the end.

#### 4. INDICATIVE BUDGET (amounts in EUR million)

TITLE: Construction of Wastewaters Treatment Facilities				SOURCES OF FUNDING								
Activities	IB (1)	INV (1)	TOTAL EXP.RE EUR (a)=(b)+(c)+(d)	IPA EU CONTRIBUTION		NATIONAL CONTRIBUTION				IFIs EUR (z)	PRIVATE CONTRIBUTION	
				EUR (b)	% (2)	Total EUR (c)=(x)+(y)+(z)	%(2)	Central EUR (x)	Regional EUR (y)		EUR (d)	%(2)
Preparatory activities	X		0,75	0	0%	0,75	100%	0,75				
Works		X	17,5	14	80%	3,5	20%	3,5				
Supervision of works	X		1,75	1	57%	0,75	43%	0,75				
TOTAL IB			2,5	1	40%	1,5	60%	1,5				
TOTAL INV			17,5	14	80%	3,5	20%	5				
<b>TOTAL PROJECT</b>			<b>20</b>	<b>15</b>	<b>75%</b>	<b>5</b>	<b>25%</b>	<b>5</b>				

Amounts net of VAT

- (1) In the Activity row use "X" to identify whether IB or INV
- (2) Expressed in % of the sum of each line of the total Expenditure (column (a))

## 5. INDICATIVE IMPLEMENTATION SCHEDULE

<b>Contracts</b>	<b>Start of Tendering</b>	<b>Signature of contract</b>	<b>Project Completion</b>
Contract 1 (works)	T+ Q1	T+ Q3	T+Q13
Contract 2 (supervision)	T+ Q1	T+Q2	T+Q13

## 6. CROSS CUTTING ISSUES

### 6.1 Equal Opportunity

Throughout project implementation there will be no discrimination on the grounds of health status, race, sex, sexual orientation, mother tongue, religion, political or other opinion, national or social origin, birth or other status. Equal opportunities for all will be ensured during project implementation.

### 6.2 Environment

The objective of this project is to help Republic Serbia to achieve compliance with the environmental *acquis*, as required by the Energy Community Treaty and the relevant EU legislation, in particular the Directive 91/271/EEC on urban waste-water treatment and Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants. Due consideration should also be paid to the new Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) which entered into force on 6 January 2011. Thus, this project will directly involve mainstreaming of environmental issues. In addition, detailed environmental impact assessments will be prepared, which are a prerequisite for favourable permits for the site of WWTP.

### 6.3 Minorities

As minorities and other vulnerable groups are usually the first to suffer from environmental degradation, and have the least chance to themselves (e.g. by choosing residences in non-polluted areas), this project will improve their living conditions in terms of reduced health hazards.

## ANNEXES

- I. Logframe in Standard Format
- II. Indicative amounts contracted and Disbursed per Quarter over the full duration of Programme
- III. Description of Institutional Framework
- IV. Reference to laws, regulations and strategic documents:
  - Reference list of relevant laws and regulations
  - Reference to AP /NPAA / EP / SAA
  - Reference to MIPD
  - Reference to National Development Plan
  - Reference to national / sectoral investment plans
- V. Details per EU funded contract
- VI. Indicative breakdown of co-financing to be provided by Serbian Electric power Industry

## ANNEX I: LOGICAL FRAMEWORK MATRIX

Construction of Waste Water Treatment Facilities			
	Contracting period expires 2 years after the signature of the Financing Agreement	Disbursement period expires 5 years after the signature of the Financing Agreement	
	<b>Total budget: EUR 20 million</b>	<b>IPA budget: EUR 15 million</b>	
<b>Overall objective</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
To contribute to improvement of environment in town of Obrenovac, as well as Belgrade city (situated at Sava River)	- River Sava water quality in terms of pollutants prescribed according to water protection regulations	- EPS report; - RHMZ report;	
<b>Project purpose</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
To assist Public Enterprise "Electric power industry of Serbia" to improve water and soil quality by construction of Waste Water Treatment Facility at TPP Nikola Tesla B	Measured concentration values (mineral oils, suspended solids, heavy metals, BOD) at the outlet from the waste water treatment facility in accordance with EU directives and standards	- EPS annual reports on the Monitoring of TPP Nikola Tesla B a impact on surface waters; - RHMZ Report;	- EU standards do not substantially change while the project is being implemented.
<b>Results</b>	<b>Objectively verifiable indicators</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
1. Constructed and commissioned Waste Water Treatment Facility at TPP Nikola Tesla B	<b>Indicators related to result 1:</b> Construction of waste water treatment facility at TPP Nikola Tesla B completed;  -Measured concentration values (mineral oils, suspended solids, heavy metals, BOD) at the outlet from the waste water treatment facility in accordance with EU directives, leading	- EPS reports; - Ministry of Mining and Energy (MME) reports	- Co-financing available; - Management team in place.

	to an improvement in water quality around the TPP		
2. Handover of projects following supervision of works and commissioning of facility.	<b>Indicators related to result 2:</b> - Minutes on facility acceptance; - Certificate on facility operation efficiency;	- Taking Over Certificates and Performance Certificates issued by the supervising engineer,	
<b>Activities</b>	<b>Means &amp; Total Costs</b>		<b>Assumptions</b>
<b>Activity 1:</b> Works contract (one Lot) for construction under FIDIC rules: Design, construction, trial operation and commissioning of WWTP at TPP Nikola B with use of FIDIC rules (Plant and Design-Build – Yellow Book)	Service contract: Supervision of works Works contract ( One lot, Plant and Design-Build) <b>IPA funding: EUR 15 million</b> This project will be implemented through a FIDIC Plant and Design - Build contract (Yellow Book), and through the separately signed contract for supervision of design, supply, works, commissioning and initial operation of new facility and equipment. EPS will provide appropriate monitoring personnel to work in parallel with the Supervising Engineer, and in accordance with the Serbian Law on Planning and Construction.		- Competent and qualified consulting and engineering companies available for the project - Willingness of TPP Nikola Tesla B staff to apply new production & control technologies - Equipments and the facilities available on the market
<b>Activity 2:</b> One service contract: Supervision of construction and commissioning of the new WWTP at TPP Nikola Tesla B			

Pre-conditions: All necessary preparatory technical documentation prepared in agreed time by beneficiary. Co-financing available in due time

**ANNEX II: Indicative amounts (in EUR million) Contracted and disbursed by quarter for the project (IPA contribution only)**

<b>Contracted</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q6</b>	<b>Q7</b>	<b>Q8</b>	<b>Q9</b>	<b>Q10</b>	<b>Q11</b>	<b>Q12</b>	<b>Q13</b>	<b>Total</b>
Contract 1 (works)			14.0											<b>14.0</b>
Contract 2 (supervision)		1.0												<b>1.0</b>
<b>Cumulated</b>		<b>1.0</b>	<b>15.0</b>											<b>15.0</b>
<b>Disbursed</b>	<b>Q1</b>	<b>Q2</b>	<b>Q3</b>	<b>Q4</b>	<b>Q5</b>	<b>Q6</b>	<b>Q7</b>	<b>Q8</b>	<b>Q9</b>	<b>Q10</b>	<b>Q11</b>	<b>Q12</b>	<b>Q13</b>	<b>Total</b>
Contract 1 (works)			1.4	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.244	1.4	<b>14.0</b>
Contract 2 (supervision)		0.3	0	0.12	0	0.12	0	0.12	0	0.12	0	0.12	0.1	<b>1.0</b>
<b>Cumulated</b>			<b>1.7</b>	<b>3.064</b>	<b>4.308</b>	<b>5.673</b>	<b>6.917</b>	<b>8.282</b>	<b>9.526</b>	<b>10.891</b>	<b>12.135</b>	<b>13.5</b>	<b>15.0</b>	<b>15.0</b>



### **ANNEX III: DESCRIPTION OF INSTITUTIONAL FRAMEWORK**

Public Enterprise 'Electric power industry of Serbia' (PE EPS) was established by the Decision of the Government of Serbia which entered into force on 1 July 2005 (100% ownership of the Republic of Serbia).

Electric Power Industry of Serbia is the largest producer of lignite in the country, with the potential annual production of around 38 million tons. Coal basins of Kolubara, Kostolac and Kosovo and Metohija\* are in the direct vicinity of thermal power plants.

Supply and sales of electricity to 3,468,393 million customers on the territory of Serbia (without Kosovo and Metohija) are carried out under electricity distribution activities of EPS.

Vertically integrated enterprise comprises of 11 corporate enterprises. (EPS cannot manage its facilities at Kosovo and Metohija as of June 1999).

- Facilities for electricity generation
- Facilities for coal production, processing and transport
- Electricity distribution

Installed capacity of EPS power plants amounts to the total of 8,359 MW, as follows:

- |   |          |
|---|----------|
| ▪ in lignite-fired thermal power plants                             | 5,171 MW |
| ▪ in gas-fired and liquid fuel-fired combined heat and power plants | 353 MW   |
| ▪ in hydro power plants   | 2,835 MW |

EPS operates three power plants of total capacity 461 MW which are not in its ownership.

According to capital evaluation and with a staff of 34,726 employees (including employees from Kosovo and Metohija) as of 31 December 2009, Electric Power Industry of Serbia is the largest enterprise in the country.

Close cooperation of EPS and the following institutions is necessary:

- Ministry of Mining and Energy;
- Ministry of Finance;
- Ministry of Environmental Protection and Spatial Planning;
- Municipalities and local communities on whose territory TPP is located.

## **ANNEX IV: REFERENCE TO LAWS, REGULATIONS AND STRATEGIC DOCUMENTS:**

**The amended National Program for Integration of Republic of Serbia into European Union– - NPI from December 2009** (refer to 3.27.7. “Control of Industrial Pollution and Risk Management”, pages: 588-591) highlight:

- EU and Serbian legislative and institutional framework in Control of Industrial Pollution and Risk Management
- Serbian Priorities in Control of Industrial Pollution and Risk Management
- for years 2010, 2011 and 2012 in legislation and institutional framework.

**Energy Development Strategy of the Republic of Serbia by 2015** (refer to page 9) sets out the following:

- **The Programme of Energy Development Strategy Implementation of the Republic of Serbia by 2015 for the period from 2007 and 2012** (page 16) highlights:

The strategic actions in the energy and electric power sector are defined in three documents: *Energy Law, Energy Sector Development Strategy to 2015 year and Strategy Implementation Programme*. Article 4 of the **Energy Law** (“The Official Gazette RS”, No. 84/2004) specifies that the “Energy Policy of Republic of Serbia comprise measures and activities to be undertaken for implementation of long-run objectives and specifically includes energy infrastructure development and introduction of contemporary technologies ...”.

The continuity of technological modernization of existing energy facilities / system / sources in the electricity sector and construction of new energy and electricity infrastructure facilities especially fall into the first and fifth long-run development and regionally strategic priorities of **Republic of Serbia Energy Strategy** that need to be met by 2015.

**In the Energy Strategy Action Programme 2009-2015** (section 8.5 - Dynamics of new electro-electrical facilities until 2012), one of priority is as following: “the construction of new and reconstruction and upgrading of existing distributive electro-electrical facilities”.

**Energy Strategy Action Programme 2009-2015** (section 9.2.1 - Overview of Capital investments) is specified that the largest investments in the forthcoming 10 years will be dedicated to rehabilitation and upgrading of existing electricity transmission system.

**National Environmental Programme of the Republic of Serbia** (NEAP RS) (refer to page 66).

**Mid-Term Development Plan of 2008.-2015** (Environmental Protection Sector–Water Protection – point 2.)

**In the MIPD 2009-2011** (*Section 2.3.1.3 - Ability to assume obligations of membership, point 5*) support may be provided for the development and implementation of strategies and policies in order to establish sectoral policies and a regulatory framework compatible with European standards.

**Energy:** Support for meeting the requirements of the Energy Community Treaty, relevant EU Directives and regional market obligations; compliance of legislation with the *acquis*. Attention

should be also paid to energy efficiency, renewable energy, radiation protection and environmental issues in energy.

**In the MIPD 2009-2011** (*Section 2.3.1.3 - Ability to assume obligations of membership, point 5*) support may be provided for the development and implementation of strategies and policies in order to establish sectoral policies and a regulatory framework compatible with European standards.

**Environment:** Support to the approximation process; development and implementation of Environmental strategies and policies and related legislation; support for integration of environmental protection principles into sectoral policies, support for environmental authorities at all levels in terms of strategic planning approach in developing environmental strategies, programs and plans, project preparation, management, planning, permitting, supervision, and monitoring; developing capacities for implementation of major environmental infrastructure projects; **support to national and local infrastructure investments including** environmental information systems, hazardous and solid waste **treatment** and/or disposal, regional land fields, **water** and sewage, air quality monitoring, nature protection, biological and landscape diversity, climate change, **reducing environmental impacts from polluters.**

Reference list of relevant EU Regulations and Serbian legislation and measures:

- Water Framework Directive (WFD) - Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for EU action in the field of water policy
- Convention on Co-operation for the Protection and Sustainable Use of the River Danube;
- Official Gazette RS № 4/2003
- Urban Waste Water Directive (UWWD) - Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment as amended by Commission Directive 98/15/EC and Regulations 1882/2003/EC and 1137/2008/EC
- Directive 76/464/EEC related to discharge of individual hazardous substances in waters;
- Directive 78/659/EEC related to surface water quality for the purpose of preserving conditions for the survival of fish species;
- Directive EU 1999/31/EC defining the protection of ground waters through conditions related to ash and slag disposal manner;
- Directive 1999/31/EC related to waste disposal;
- Law on Environment Protection - Official Gazette RS № 135/04;
- Law on Integrated Pollution Prevention and Control - Official Gazette RS № 135/04;
- Law on water - Official Gazette RS № 46/91, 54/96
- The Programme of Energy Development Strategy Implementation of the Republic of Serbia by 2015 for the period from 2007 and 2012;
- Sustainable Development Strategy of the Republic of Serbia;

- National Environmental Programme of the Republic of Serbia (NEAP RS);
- Sustainable development and environmental management measures were planned for the next ten years for the Republic of Serbia within the National Environmental Program of the Republic of Serbia (NEAP RS – Draft) adopted in accordance with the Environmental Protection Law (Official Gazette RS № 135/04).
- Legal requirement concerning operation harmonisation of existing units with ELV requirements for air emission of harmful substances: Environmental Protection Law (Republic of Serbia) and the Law on Integrated Pollution Prevention and Control (Republic of Serbia);
- Orientation of Electric Power Industry of Serbia towards the fulfilment of all EU norms and standards from the subject field.
- Water Act ('Official Gazette RS', № 46/91), regulating protection, use and management of waters;
- Rules on Hazardous Substances in Waters ('Official Gazette SRS', № 31/82);
- Rules on Hygienic Validity of Potable Water ('Official Gazette RS', № 33/87);
- Waste Framework Directive - Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Directives 75/439/EEC, 91/689/EEC and 2006/12/EC are hereby repealed with effect from 12 December 2010)

## ANNEX V: DETAILS PER EU-FUNDED CONTRACT

The project will be implemented through 1 (one) Works contract and 1 (one) Service Contract.

### Construction and Commissioning of the Wastewater Treatment Facility at TPP Nikola Tesla B

<b>Preparatory Phase (co-financed by EPS)</b>	
1.	Preparation of Technical Documentation
1.1	Development of Preliminary Design;
1.2	Development of Feasibility Study;
1.3	Development of EIA;
1.4	Development of Technical Requirements and Tender Dossier (financed from IPA);
2.	Dismantling of Existing Waste Water Collection and Transport System;
<b>THE ABOVE ARE PRECONDITIONS FOR THE IPA CONTRACTS, WHOSE DETAILS ARE SET OUT BELOW:</b>	
3.	<b>Preliminaries, Design &amp; Works (Financed from IPA)</b>
3.1	Preliminaries
3.1.1	Review of preliminary documentation, confirmation that the locations are available for the works to begin (including enough suitable and secure space for the construction teams is available at the sites);
3.1.2	Site Survey / Discussions with Site Managers;
3.1.3	Application for appropriate construction, environment and planning permits (or, if these have been granted already, validation of the permitting process);
3.2	Detailed Design of WWTP;
3.2.1	Preparation of Design documents, Plans, Technical Specifications for Plant, and Bill of Quantities;
3.2.2	Liaison with Authorities over granting of construction, planning and environmental permits;
3.3	Works
3.3.1	Ground Works
3.3.2	Construction Works, and Preparations for Receiving Plant

3.3.3	Installation of Plant
3.3.4	Connecting to Existing Infrastructure (services, conduits, pipes, etc.)
3.4	Commissioning & Handover
3.4.1	Testing of Facility
3.4.2	Full Scale Operation and Running of the Facility
3.4.3	Training of client's staff in operation and maintenance
3.4.4	End of Commissioning, Handover and Signing off of Project

### **Project Supervision**

The general role of the supervisor is to liaise between the client and the contractor whilst overseeing the detailed and construction works. This will include ensuring that the appropriate financial and technical document audit trails are established and maintained. The details of the specific tasks will be set out in terms of reference (ToR), but they will include, but not be limited to:

- ✓ Coordinating site survey and liaison with site management;
- ✓ Checking that relevant permits have been granted;
- ✓ Review / validation of preliminary design;
- ✓ Review of detailed design with client and contractor, signing off each stage as appropriate;
- ✓ Review of invoices and requests for payment as appropriate (signing off each stage according to the FIDIC contractual agreements); and
- ✓ Supervision of works, liaising with client and contractor to resolve any discrepancies in the design, to ensure that all works comply with the appropriate Serbian administrative, environmental and legal requirements;
- ✓ Supervision of commissioning of facilities by the contractor, ensuring that the contractor trains the client in their operation and maintenance; and
- ✓ Signing-off of the works and handover to the client.

In parallel with the Supervising Engineer, EPS's monitoring personnel will work (in accordance with the Serbian Law on Planning and Construction) on the supervision of dismantling of existing wastewater collection and transport system and construction of the new wastewater collection and transport system and transport to the joint collector.

**ANNEX VI - INDICATIVE BREAKDOWN OF CO-FINANCING TO BE PROVIDED BY SERBIAN ELECTRIC POWER INDUSTRY (EPS CO-FINANCING)**

<b>No.</b>	<b>Description</b>	<b>Value (EUR)</b>
	<b>Preparatory Phase</b>	
1.	<b>Preparation of Technical Documentation</b>	
1.1	Development of Preliminary Design	300,000
1.2	Development of Feasibility Study	300,000
1.3	Development of EIA	150,000
2.	<b>Dismantling of Existing Waste Water Collection and Transport System</b>	3,500,000
3.	<b>Supervision</b>	750,000
In parallel with the Supervising Engineer, EPS's monitoring personnel will work (in accordance with the Serbian Law on Planning and Construction) on supervision of dismantling of existing waste water collection and transport system and construction of the new waste water collection and transport system and transport to the joint collector.		
<b>Waste Water Treatment Facility at TPP Nikola Tesla B</b>		<b>5,000,000</b>
<b>Total (EUR)</b>		

## LIST OF ABBREVIATIONS:

1.	TPP	Thermo Power Plant
2.	EPS	Electric Power Industry of Serbia
3.	SAA	Stabilization and Association Agreement
4	MIPD	Multi-annual Indicative Planning Document
6.	IPPC	Integral Prevention Pollution Control
7.	BAT	Best Available Technology
8.	WWTP	Waste Water Treatment Plant
10.	TENT B	Thermo Power Plant Nikola Tesla B
11.	EIA	Environmental Impact Assessment
12.	FGD	Flue Gas Desulphurisation
13.	RHMZ	Republic Hydro-Meteorological Institute
14.	BOD	Biological Oxygen Demand
15.	ESP	Electrostatic Precipitator
16.	EUD	EU Delegation
17.	EAR	European Agency for Reconstruction
18.	SPO	Senior Project Officer