



## **ENVIRONMENTAL IMPROVEMENT PROJECT AT KOLUBARA MINE BASIN**

### **NON-TECHNICAL SUMMARY**

#### **Introduction**

PE Elektroprivreda Srbije (EPS) is developing an Environmental Improvement Project at the Kolubara Mine Basin in Serbia. This project will improve the quality and consistency of lignite mined at Kolubara, with subsequent improvements to the operational and environmental performance of EPS' Thermal Power Plants (TPPs).

The European Bank for Reconstruction and Development (EBRD) is considering providing a loan of EUR 80 million to EPS as part of a EUR 140 million investment programme. The proposed loan, together with potential EUR 60 million co-financing from KfW, will fund the purchase of:

- A coal management system for the western part of the Kolubara Mining Basin. The new equipment will improve the coal mining efficiency of EPS at the Kolubara basin (western part) and significantly improve the quality and uniformity of the lignite it delivers to its power stations;
- A coal excavator, conveyor and spreader system for the new open cast mine Field C in the eastern part of the Kolubara Mining Basin; and,
- A spreader system for interburden at the Tamnava West Field open cast mine.

#### **Project Description and Background**

The Kolubara mine is located in the Kolubara Mining Basin, approximately 50km south of Belgrade (see Annex 1). The site overlaps with the municipalities of Lazarevac, Lajkovac, Ub and Koceljeva, as well as smaller parts of the municipalities of Arandjelovac, Barajevo and Obrenovac. In total it covers a surface area of 600km<sup>2</sup>.

Kolubara Mining Basin is owned by the Republic of Serbia. Management and utilization is entrusted with Public Enterprise Elektroprivreda Srbije, organized as vertically integrated company, within which the subsidiary RB Kolubara Lazarevac operates.

EPS is the dominant company in the Serbian electricity sector, responsible for lignite mining and electricity generation, distribution and supply. EPS generates almost all of Serbia's electricity. 55% of its installed capacity of 7,120 MW is provided by six lignite-fired power stations supplied by two basins, Kolubara and Kostolac. The Kolubara Mining Basin provides around 75% of the lignite used for EPS' thermal generation. It produces over 30 million tonnes per year, which is supplied to the Nikola Tesla, and Morava plants on EPS' own railway system.

At present the basin has an automated system for analysing the calorific value and other characteristics of the lignite, but it does not have an online analysis system. The decision on whether lignite (to be sent directly to the power plants) or inter-burden (layers of earth between seams which is to be dumped) is being mined is made by the competent technical staff based on visual observation and experience. Lack of online analyzers causes very high coal quality variations delivered to the power plants. This requires liquid fuel to be used in addition to the coal in the thermal power plants, and results in increased equipment wear and tear and higher harmful gases emission. Moreover, uncontrolled coal combustion occurs on the open cast mine dump sites.

The proposed investment programme is for the modernisation of RB Kolubara's coal mining operations. The principal objectives of the proposed investment project (the Project) are to improve the RB Kolubara mining operations efficiency and significantly improve the quality and uniformity of the lignite it delivers to EPS' power stations.

The Project consists of three closely integrated and interdependent components:

- An introduction of a coal quality management system on open cast mines in the western part of the Kolubara Mining Basin. This equipment will allow RB Kolubara to perform online analysis, control and management of lignite quality as it is excavated from various different fields in the basin and blend higher and lower qualities to ensure that the lignite supplied to the power plants is of a uniform quality and within the required parameters.
- Procurement and erection of a spreader in the Tamnava West Field. This will allow for the selective mining of lignite, inter-burden and overburden.

- The acquisition of a new ECS system (excavator, conveyor and spreader) for Field C that will allow lignite output to increase and the blending of higher calorific value lignite with lower-quality lignite – the lignite in the eastern part of the mining basin has a higher calorific value than the lignite in the western part.

### **Benefits of the Project**

The Project is designed to generate the following key benefits:

- RB Kolubara will extract its natural resources more efficiently and cleanly. Currently, part of lower quality lignite is dumped together with inter-burden, which is not cost-effective and is wasteful. Moreover, this increases the dumped overburden volume and causes uncontrolled fires on the dump sites and increased Green House Gas emissions;
- RB Kolubara will supply lignite to its existing client power plants that is of a uniform quality. This will allow those plants to generate in accordance with their design parameters, leading to more stable and efficient operation and controlled uniform emissions. It will also allow those plants to stop using heavy fuel oil when lignite quality is too low. Taken together this will result in lower levels of CO<sub>2</sub> and other emissions as well as reduced wear and tear and maintenance costs.

These benefits will contribute to the reduction of air emissions associated with coal extraction, help achieve national air emissions targets including CO<sub>2</sub>, and assist the operators of the power plant in achieving increasingly stringent emission limits set by the recently introduced EU Directive 2010/75 on Industrial Emissions (integrated pollution prevention and control).

### **Studies Undertaken**

Studies regarding potential coal exploration, spatial planning and impact assessment have been undertaken over several years in order to inform the development of proposals. The following have been prepared and published prior to the consideration of this investment by the Bank:

- Spatial Plan of the Republic of Serbia (The Official Gazette of the Republic of Serbia no. 13/96);
- Spatial Plan of Kolubara Lignite Basin;

- Spatial Plan of the Exploitation Area of Kolubara Lignite Basin;
- Strategic Environmental Impact Assessment of the Spatial Plan for the Area of Kolubara Lignite Basin(2008);
- Strategic Environmental Impact Assessment for the General Regulation Plan for the Settlements Baroševac, Medoševac, Zeoke and Burovo;
- Environmental Impact Assessment Study for open cast mine "Tamnava West Filed" European Agency for Reconstruction CARDS FRAMEWORK CONTRACT HPC Harress Pickle Consult. LDK Consultants (2002);
- Environment Impact Assessment Study of the Project, "Supplementary Mining Design, Tamnava West Field". Electric Power Industry of Serbia.
- Environmental Impact Assessment Study for the project: "Coal exploitation in the open cast mine "Field C", For the capacity of 5 mil. Tons annually, with the excavation of the east dump site "Istocna Kipa". Electric Power Industry of Serbia (2009)

### **Environmental and Social Impact of the Project**

Environmental Impact Assessments have been undertaken for both the Field C and Tamnava West Field sites in line with national and EU legislative requirements. A summary of the main environmental impacts from both sites and the proposed mitigation measures to reduce, minimise and/or prevent those impacts, is provided here.

On initial removal of soil and overburden there will be direct impact on ecological features, although no protected sites or rare or scarce species have been recorded from the sites and therefore no significant effect is anticipated. Habitat restoration will be undertaken to replace in the longer term features of nature conservation interest as areas of the works are complete.

Archaeological resources have been identified and include five houses and two graveyards of note in Tamnava West Field: two of the houses will be relocated, the other three houses are considered to be in too poor a condition to move. At Field C a graveyard will be relocated Baroševac to a new 4 ha site at Petkovača (near Zmajevac). Discussions with the relevant authorities have been undertaken regarding the protection measures and the appropriate experts have prepared the

mitigation plans. Through procedures put in place prior to and during initial works, qualified archaeologists will provide advice for recording and/or re-location of valuable archaeological resources affected by the works. An archaeologist will remain available and ensure that any chance finds are appropriately recorded and protected.

As the coal fields are developed there will be direct impacts on water resources and sections of the River Pestan in Field C and River Kladnica in Tamnava West will require redirection. Hydrological studies will inform the appropriate design of the diversions and monitoring will be carried out to mitigate the impact on water resources and nature conservation.

Potential environmental impacts from the continued operation of the site include air and surface and groundwater quality, soil contamination and noise impacts. Key mitigation measures proposed include the introduction of appropriate water collection and treatment techniques, the prevention of dust generation by enclosure and wetting and the use of appropriately specified plant to reduce noise generation. There will be ongoing environmental monitoring of air and water quality, soil contamination and noise levels in the areas, and should issues arise, corrective measures will be implemented. Corrective measures would include spill response and clean up, additional damping down to prevent dust generation and the provision of noise barriers should noise exceed specified levels.

Provisions relating to the relocation of households and settlements at Kolubara are set out in the Spatial Plan for the area and the Regulation plans of local governments. These documents, adopted by the Serbian Government, are the principal planning documents for the development. They define the policy and procedures for relocation of households and settlements, and identify the property (land, households, infrastructure and public facilities, etc) requiring relocation due to the Kolubara Mining Basin coal mining activities.

Alternative locations for the relocation of households, infrastructure and public facilities, general resettlement conditions and compensation issues are defined by the Spatial and Urban Plans and locations have been agreed between the Kolubara Mining Basin, EPS, the competent authorities of the municipalities and citizens affected by the resettlement.

In the case of the Tamnava West Field OCM compensations have been paid for all properties affected by the mining operations until the end of 2018. A new school was constructed, a medical centre expanded, a preschool is under construction, and sports-recreational facilities have been provided for citizens resettled from the Tamnava West Field area in Lajkovac and the neighbouring Jabucje settlement, as well as for the resettled population of Mali Borak and Skobalj. For the resettlement of households from Kalenic, a location in another part of this settlement has been developed, and in addition to the plots intended for housing development, a new school, cultural centre and the football field have been provided.

For those resettled from the Field C OCM, the complete infrastructure was constructed at the Jelav location in the Barosevac settlement. In addition, construction of a new school is in the final phase, and the complete infrastructure construction has been agreed for the entire Barosevac settlement, together with the sports-recreational facilities. There are 10 plots (land only) that still need to be expropriated, and the Baroševac village graveyard is to be relocated to a new 4 ha site at Petkovača (near Zmajevac); for these activities all agreements are in place.

Resettlement of 45 households located on the left and the right side of the road Arandjelovac-Vreoci is also required. For Field C, 17 of these households (located on the north side of the road) were relocated in 2008. The remaining 28 households (on the south side of the road outside the Field C OCM mining boundaries) are located within an area required for a new erection yard, workshop and administrative building for the future Field E. These 28 properties have been resettled under a special Resettlement Plan within the Field E OCM Development Plan, which falls outside of the scope of this Project. All household resettlements for this Project are therefore considered to have been completed.

As part of the spatial planning process in Serbia, communities and other stakeholders are consulted during the development of plans and implementation processes, and their views have been incorporated into the final plans and management arrangements. The initial consultation with stakeholders was carried out by the Ministry of Environment and Spatial Planning during the formulation of the 2006 and 2008 spatial plans for the development of the lignite coal reserves in the Kolubara Mining Basin.

The consultation process for the resettlement programme has included direct contact with the interested and affected residents through the conduct of surveys and related consultation meetings, and direct talks with the individuals concerned.

### **Implementation of Environmental Requirements**

EBRD have undertaken Environmental and Social Due Diligence of the proposed Project and its compliance with EBRD's Environmental and Social Policy 2008. Areas where greater alignment with the Environment and Social Policy could be achieved have been identified and an Environmental and Social Action Plan (ESAP) has been prepared to detail the measures to achieve this. The ESAP has been agreed with EPS and RB Kolubara and it sets out the programme, identifies those responsible and defines success criteria, and as such provides a framework for monitoring the implementation of the measures. The main measures required by the ESAP are described below.

Inception Plans for both mine sites that will describe the detailed mitigation and monitoring measures needed, based on the requirements identified in the EIAs for Field C and Tamnava West, and will set out a programme detailing when and how the measures will be implemented to achieve the requirements. The ESAP requires the programme to be implemented. A waste management plan will detail how the requirements of the EU Waste Directive will be met and a strategy for land restoration will be prepared.

The Stakeholder Engagement Plan (SEP), that describes proposed procedures to be followed to ensure that stakeholders are identified and consulted throughout the project will be implemented. The SEP also provides mechanisms by which complaints and grievances are lodged and managed, and how action can be undertaken to remediate issues raised. The SEP sets out the previous stakeholder engagement activities undertaken, the resettlement and compensation arrangements that have been agreed and implemented, and a Resettlement Action Plan is to be prepared and implemented with regards to ongoing and future resettlement activities. To support the Stakeholder engagement processes, RB Kolubara will appoint community liaison officers and develop mechanisms to share information about the project with local communities and other stakeholders.

RB Kolubara will develop and implement a Human Resources policy which outlines commitments to protect employees from discrimination, promote equal opportunities, prohibit forced or child labour and protect non-employee workers. A procedure for ensuring equipment and service suppliers also adopt responsible measures is to be developed. Finally a number of measures are to be taken to strengthen health and safety, and to align it with international best practice.

Figure 1: The Kolubara Mining Basin

