

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Bosnia and Herzegovina

Project: Flue Gas Desulphurization Construction Project for Ugljevik Thermal Power Plant

Loan Agreement: October 20, 2009

Loan Amount: 12,633 million Yen

Borrower: Bosnia and Herzegovina

2. Background and Necessity of the Project

(1) Current State and Issues of the Electricity Sector in Bosnia and Herzegovina

Bosnia and Herzegovina has four major thermal power plants and several hydraulic power plants, accounting for about half of its power sources. The thermal power plants are run on coal, and the emission of air pollutants from the power plants exceeds the national environmental standards, and there are concerns about the harmful impact on the environment. Bosnia and Herzegovina must reduce air pollutants emitted by all of its thermal power plants in order to join the European Union (EU) in the future.

The Ugljevik Thermal Power Plant accounted for approximately 23% of the power generating capacity in the Republic of Srpska (about 8% of the power generating capacity for the country as a whole) in 2007, making this plant indispensable to a stable supply of power. However, its SO₂ emissions are the highest among the four thermal power plants. Currently, SO₂ emissions reach 25,000 mg/m³N at the maximum, which substantially exceeds the domestic emissions standard of 400 mg/m³N. As such, there are fears that the resulting air pollution could impair health in neighboring regions.

(2) Development Policies for the Electricity Sector in Bosnia and Herzegovina and the Priority of the Project

Bosnia and Herzegovina established “The Mid-Term Development Strategy of Bosnia and Herzegovina (MTDS)” in March 2004, which lays out three main objectives: “to create conditions for sustainable and balanced economic development,” “to reduce poverty,” and “to accelerate EU integration.” Since the country must take environmental measures conforming to EU standards in order to join the EU, it is moving ahead with the work to bring its domestic emissions standards in line with EU standards. The “National Environmental Action Plan (NEAP)” (2004) identifies the construction of a flue gas desulphurization (FGD) system at thermal power plants as an important part of efforts to reduce SO₂ and other air pollutants. Moreover, the “Energy Sector Study” (2008), carried out jointly by Bosnia and Herzegovina and the World Bank, cites the construction of FGD systems as a priority in reducing air pollutants.

The Republic of Srpska established the long-term strategy of the electricity sector, “Energy Development Strategy of the Republic of Srpska in the period from 1995 to 2020” and the three-year short-term strategy “Investment Plan 2007-2009.” Both of these strategies stipulate

that environmental conservation programs at thermal power plants must be reinforced. In addition, the Republic of Srpska's environmental legislation mandates that existing thermal power plants acquire Ecological Permission, which is intended as an environmental conservation measure. The Ugljevik Thermal Power Plant has established an Environmental Action Plan (involving the construction of environmental facilities such as an FGD system and reductions in the resulting air pollutant emissions, among others), which has already been approved by the Republic of Srpska's Ministry of Urban Planning, Civil Engineering and Ecology. However, if this plan is not achieved in 2013, the plant would not be able to obtain Ecological Permission, and the Ministry could issue directives, including an order to cease operation of the power plant.

(3) Japan and JICA's Policy and Operations in the Electricity Sector and Environmental Field

There has been one loan project in the electricity sector, and one on-going training course in the environmental field. The environmental field falls within the category of "Addressing Global Issues," which is a priority issue of the Japan's ODA Charter, as well as that of JICA's assistance to Bosnia and Herzegovina. This project is expected to transfer expertise on environmental monitoring to the executing agency, and then from the executing agency to other thermal power plants. Also, JICA's assistance in the environmental field in the country is expected to be further augmented, based on the needs identified in the process of the technology transfer to the executing agency.

(4) Other Donors' Activities

Bosnia and Herzegovina's electricity sector has received aid in setting up an electrical grid from the EBRD, EIB and KfW, aid in repairing drainage systems at thermal power plants from the World Bank, and aid in repairing hydraulic power plants from the EIB.

(5) Necessity of the Project

The construction of the FGD system, which is expected to reduce SO₂ emissions by 98.4%, would make significant contributions to improving the environment in the surrounding area, and would bolster its efforts to join the EU in the future by helping it to achieve domestic environmental standards and comply with EU standards. This is consistent with JICA's assistance priority for the country, and the project is thus highly necessary and relevant.

3 Project Description

(1) Project Objective(s)

This project is intended to reduce air pollutants (SO₂ and dust) by constructing an FGD system at the Ugljevik Thermal Power Plant in Bosnia and Herzegovina. This would contribute to improvements in the country's environment and its efforts to meet EU environmental standards for its EU accession in the future.

(2) Project Site/Target Area

Ugljevik Thermal Power Plant

(3) Project Component(s) (including procurement method)

1) Construction of FGD system

- 2) Construction of related systems (Limestone system, Gypsum handling system, etc.)
- 3) Consulting services (basic design, tendering assistance, construction supervision, technology transfer for FGD operation, maintenance and management, support for monitoring environmental and social considerations, and others)
- (4) Estimated Project Cost (Loan Amount)
 - 15,900 million Yen (Loan Amount: 12, 633 million Yen)
- (5) Schedule
 - The project is scheduled for March 2010 to February 2016 (total of 72 months). The project will be deemed complete when the FGD system is operable (February 2015).
- (6) Project Implementation Structure
 - 1) Borrower: Bosnia and Herzegovina
 - 2) Executing Agency: Mixed Holding “Electroprivreda of Republika Srpska”
 - 3) Operation and Maintenance System: Mine and Thermal Power Plant Ugljevik
- (7) Environmental and Social Consideration/Poverty Reduction/Social Development
 - 1) Environmental and Social Consideration
 - Category B
 - Reason for Categorization: This project is classified in category B, as defined in the JBIC Guidelines for Confirmation of Environmental and Social Considerations (established in April 2002), as it does not correspond to a sector or have attributes that would tend to affect the environment, nor does it correspond to a region susceptible to adverse impacts, and it is not deemed likely to have a serious adverse effect on the environment.
 - Environmental Permit: The Environmental Impact Assessment (EIA) for this project has been approved by the Republic of Srpska’s Ministry of Urban Planning, Civil Engineering and Ecology in August 2009.
 - Anti-Pollution Measures: The project plans to use appropriate construction equipment to alleviate air pollution and noise during construction.
 - Natural Environment: This project will be carried out on the existing site of the thermal power plant in question and any undesirable impact on the natural environment is expected to be minimal.
 - Social Environment: This project involves the construction of an FGD system in the existing thermal power plant, and thus would not necessitate any land acquisition or resettlement.
 - Other / Monitoring: The executing agency will monitor the project’s air quality and water quality.
 - 2) Promotion of Poverty Reduction: None
 - 3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Handicapped etc.): None
- (8) Collaboration with Other Donors: The World Bank is currently repairing the Ugljevik Thermal

Power Plant's drainage system (to be completed in 2010). Wastewater from the FGD system is expected to be appropriately disposed of.

(9) Other Important Issues: None

4 Targeted Outcomes

(1) Performance Indicators

1) Operation and Effect Indicators

Indicator	Baseline (Actual Value in 2007)	Target (2017) 【 Expected value 2 years after project completion 】
SO ₂ emission concentration at rated output (mg/ m ³ N)	25,000	400
Dust emission concentration at rated output (mg/ m ³ N)	150	50
Desulphurization rate (%)	-	98.4

2) Internal Rate of Return

Although this project is intended to improve the environment, there is no data that quantifies the negative impact of air pollution in the area surrounding the project site. Therefore, it is difficult to calculate the project's Economic Internal Rate of Return (EIRR), which indicates the project's benefits such as the reduction of medical costs.

5 External Factors and Risk Control

None

6 Lessons Learned from Past Projects

Ex-post evaluations of similar projects in the past indicated the importance and need for environmental monitoring. Accordingly, this project should monitor environmental conditions regularly to accurately identify the project's anticipated effect of reducing air pollution. To this end, appropriate technology on environmental monitoring will be transferred to the executing agency by including it in the TOR for the consultant to be hired for this project.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) SO₂ emission
- 2) Dust emissions
- 3) Desulphurization rate

(2) Timing

Two years after project completion