IMPLEMENTATION COMPLETION AND RESULTS REPORT
(IDA-52400 IDA-H2340 IDA-H3190 TF-13509 TF-90160)

ON
TWO GRANTS AND A CREDIT
IN THE AMOUNT OF SDR 9.90 MILLION
(US$ 14.7 MILLION EQUIVALENT)

TO THE
REPUBLIC OF KOSOVO

FOR A
ENERGY SECTOR CLEAN-UP AND LAND RECLAMATION PROJECT

February 28, 2017

Environment and Natural Resource Global Practice
Europe and Central Asia Region
CURRENCY EQUIVALENTS

(Exchange Rate Effective 01/09/2017)

Currency Unit = SDR
1.00 = US$ 1.34
US$ 1.00 = 0.74

FISCAL YEAR
July 1 – June 30

ABBREVIATIONS AND ACRONYMS

AF Additional Financing
BAT Best Available Techniques
CLRP Clean-up and Land Reclamation Project
CLRP-FAF Clean-up and Land Reclamation Project – First Additional Financing
CLRP-SAF Clean-up and Land Reclamation Project – Second Additional Financing
CSO Civil Society Organizations
DALY Disability Adjusted Life Years
DO Development Objective
EIA Environmental Impact Assessment
EMP Environmental Management Plan
ERR Economic Rate of Return
ESIA Environmental and Social Impact Assessment
ESTAP Energy Sector Technical Assistance Project
EU European Union
GDP Gross Domestic Product
GOK Government of Kosovo
GON Government of The Netherlands
ICR Implementation Completion Report
IDA International Development Association
IP Implementation Progress
ISN Interim Strategy Note
ISR Implementation Supervision Report
JICA Japan International Cooperation Agency
KEM Kosovo Economic Memorandum
KEK Kosovo Energy Cooperation
KEPA Kosovo Environmental Protection Agency
KPP Kosovo Power Project
KTA Kosovo Trust Agency
LPI Lignite Power Initiative
LPTAP Lignite Power Technical Assistance Project
MED Ministry of Economic Development
MESP Ministry of Environment and Spatial Planning
MOF Ministry of Finance
MW Mega Watts
NGO Non-Governmental Organizations
NMF New Mining Field
ORAF Operational Risk Assessment Framework
PAD Project Appraisal Document
PDO Project Development Objective
PISG Provisional Institutions of Self-Government
PMU Project Management Unit
UNMIK United Nations Interim Administration Mission in Kosovo
USD United States Dollars
RAP Resettlement Action Plan
RPF Resettlement Policy Framework
SAF Second Additional Financing
WB World Bank

Senior Global Practice Director: Karin Kemper
Practice Manager: Valerie Hickey
Project Team Leader: Katelijn van den Berg
ICR Team Leader: Jiang Ru
ICR Lead Author: Sanne Agnete Tikjoeb
KOSOVO
Energy Sector Clean-Up and Land Reclamation Project

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A. Basic Information

<table>
<thead>
<tr>
<th>Country:</th>
<th>Kosovo</th>
<th>Project Name:</th>
<th>Energy Sector Cleanup and Land Reclamation Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project ID:</td>
<td>P096181</td>
<td>L/C/TF Number(s):</td>
<td>IDA-52400,IDA-H2340,IDA-H3190,TF-13509,TF-90160</td>
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<tr>
<td>ICR Date:</td>
<td>02/28/2017</td>
<td>ICR Type:</td>
<td>Core ICR</td>
</tr>
<tr>
<td>Lending Instrument:</td>
<td>SIL</td>
<td>Borrower:</td>
<td>KOSOVO</td>
</tr>
<tr>
<td>Original Total Commitment:</td>
<td>XDR 3.80M</td>
<td>Disbursed Amount:</td>
<td>XDR 9.67M</td>
</tr>
<tr>
<td>Revised Amount:</td>
<td>XDR 9.90M</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental Category: A

Implementing Agencies:
Kosovo Energy Cooperation
Ministry of Environment and Spatial Planning

Cofinanciers and Other External Partners:

B. Key Dates

<table>
<thead>
<tr>
<th>Process</th>
<th>Date</th>
<th>Process</th>
<th>Original Date</th>
<th>Revised / Actual Date(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appraisal</td>
<td>04/26/2006</td>
<td>Restructuring(s):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approval</td>
<td>06/13/2006</td>
<td>Mid-term Review:</td>
<td>02/15/2010</td>
<td>02/15/2010</td>
</tr>
<tr>
<td>C. Ratings Summary</td>
<td></td>
<td>Closing:</td>
<td>12/31/2010</td>
<td>08/31/2016</td>
</tr>
</tbody>
</table>

*This date was pulled from the system and could not be changed, but the actual date of Board approval is May 10, 2013.

C. Ratings Summary

C.1 Performance Rating by ICR

<table>
<thead>
<tr>
<th>Outcomes:</th>
<th>Satisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk to Development Outcome:</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
### Bank Performance:
- Moderately Satisfactory

### Borrower Performance:
- Moderately Satisfactory

#### C.2 Detailed Ratings of Bank and Borrower Performance (by ICR)

<table>
<thead>
<tr>
<th>Bank</th>
<th>Ratings</th>
<th>Borrower</th>
<th>Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality at Entry:</td>
<td>Moderately Satisfactory</td>
<td>Government:</td>
<td>Moderately Satisfactory</td>
</tr>
<tr>
<td>Quality of Supervision:</td>
<td>Moderately Satisfactory</td>
<td>Implementing Agency/Agencies:</td>
<td>Moderately Satisfactory</td>
</tr>
<tr>
<td>Overall Bank Performance:</td>
<td>Moderately Satisfactory</td>
<td>Overall Borrower Performance:</td>
<td>Moderately Satisfactory</td>
</tr>
</tbody>
</table>

#### C.3 Quality at Entry and Implementation Performance Indicators

<table>
<thead>
<tr>
<th>Implementation Performance</th>
<th>Indicators</th>
<th>QAG Assessments (if any)</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potential Problem Project at any time (Yes/No):</td>
<td>Yes</td>
<td>Quality at Entry (QEA):</td>
<td>None</td>
</tr>
<tr>
<td>Problem Project at any time (Yes/No):</td>
<td>No</td>
<td>Quality of Supervision (QSA):</td>
<td>None</td>
</tr>
<tr>
<td>DO rating before Closing/Inactive status:</td>
<td>Satisfactory</td>
<td></td>
<td></td>
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</table>

#### D. Sector and Theme Codes

<table>
<thead>
<tr>
<th>Major Sector/Sector</th>
<th>Original</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and Extractives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Energy and Extractives</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>Mining</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Theme/Theme/Sub Theme</th>
<th>Original</th>
<th>Actual</th>
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<tbody>
<tr>
<td>Environment and Natural Resource Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Health and Pollution Management</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Air quality management</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Soil Pollution</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Water Pollution</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Environmental policies and institutions</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Urban and Rural Development</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Development</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Land Administration and Management</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>
E. Bank Staff

<table>
<thead>
<tr>
<th>Positions</th>
<th>At ICR</th>
<th>At Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vice President:</td>
<td>Cyril E Muller</td>
<td>Shigeo Katsu</td>
</tr>
<tr>
<td>Country Director:</td>
<td>Ellen A. Goldstein</td>
<td>Orsalia Kalantzopoulos</td>
</tr>
<tr>
<td>Practice Manager/Manager:</td>
<td>Valerie Hickey</td>
<td>Laura Tuck</td>
</tr>
<tr>
<td>Project Team Leader:</td>
<td>Katelijn Van den Berg</td>
<td>Frank Van Woerden</td>
</tr>
<tr>
<td>ICR Team Leader:</td>
<td>Jiang Ru</td>
<td></td>
</tr>
<tr>
<td>ICR Primary Author:</td>
<td>Sanne Agnete Tikjob</td>
<td></td>
</tr>
</tbody>
</table>

F. Results Framework Analysis

Project Development Objectives (from Project Appraisal Document)
The objectives of the Kosovo Cleanup and Land Reclamation Project were to: (a) address environmental legacy issues related to open dumping of ashes on land from KEK's Kosovo A thermal power plant; (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remove Kosovo A ash dump; and (c) build capacity in KEK for continued clean-up and environmentally good practice mining operations.

The PDO as stated in the Financing Agreement was: To address environmental legacy issues related to the open dumping of ashes from KEK's Kosovo A thermal power plant; (ii) to enable KEK to free land for community development purposes currently taken by overburden material and to enable KEK to remove the Kosovo A ash dump; and (iii) to initiate structural operations in KEK for continued clean-up and environmentally good practice mining operations.

Revised Project Development Objectives (as approved by original approving authority)
The project development objectives and related indicators were revised twice. See section 1.3 for an explanation of the justifications for revising the PDO.

In the first Board-approved restructuring of June 3, 2009, part (b) of the PDO was modified as follows: (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remediate Kosovo A ash dump.

In the second Board-approved restructuring of March 28, 2013, part (c) of the PDO was modified as follows: (c) support KEK and MESP to implement continued clean-up operations and environmental good practices in the mining and energy sector.

In conclusion, the final PDO at project closing was to: (a) address environmental legacy issues related to open dumping of ashes on land from KEK's Kosovo A thermal power plant; (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remediate Kosovo A ash dump; and (c) support KEK and MESP to implement continued clean-up operations and environmental good practices in the mining and energy sector.

1 This date was pulled from the system and could not be changed, but the actual date of Board approval is May 10, 2013. To be consistent, the ICR will make reference to March 28, 2013 throughout the document.
(a) PDO Indicator(s)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Baseline Value</th>
<th>Original Target Values (from approval documents)</th>
<th>Formally Revised Target Values</th>
<th>Actual Value Achieved at Completion or Target Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator 1: Percentage of ash disposal that complies with environmental good practice and is redirected from open dumping on the Kosovo A Ash Dump to the Mirash mine</td>
<td>0%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Date achieved</td>
<td>05/15/2006</td>
<td>07/01/2008</td>
<td>12/31/2014</td>
<td>12/31/2013</td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target 100% achieved by December 2013 when the wet ash system became operational. Indicator relates to PDO Outcome (a).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 2: Remediation of Kosovo A Ash Dump, eliminating dust problems and pollution infiltration from the ashes into groundwater</td>
<td>0%</td>
<td>55%</td>
<td>74%</td>
<td></td>
</tr>
<tr>
<td>Date achieved</td>
<td>06/03/2009</td>
<td>12/31/2010</td>
<td>08/31/2016</td>
<td></td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target achieved in November 2010 with 74% of the 243 ha large Kosovo A ash dump remediated within the original timeframe, and exceeded by 35% at project closing. Indicator revised in 2009 and relates to PDO Outcome (b).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 3: Contaminated land managed or dump sites closed under the project</td>
<td>0 ha</td>
<td>156 ha</td>
<td>179 ha</td>
<td></td>
</tr>
<tr>
<td>Date achieved</td>
<td>05/15/2006</td>
<td>12/31/2014</td>
<td>08/31/2016</td>
<td></td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target exceeded by 14 percent at project closing. The unit of measurement in hectares was intended to complement the remediation indicator in percentage. Target of 156 ha referred to the size of Kosovo A ash dump to be remediated under the project, which involved managing contaminated parts and closing the dump site. Core Sector Indicator added in the 2013 and relates to PDO Outcome (b).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 4: Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump</td>
<td>&lt;300 mg/m2/day</td>
<td>&lt;100 mg/m2/day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date achieved</td>
<td>12/31/2010</td>
<td>12/31/2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target added by ICR team, and 100% achieved in December 2013 with the introduction of the wet ash system. A target for the indicator was never defined, tracked, revised nor dropped. Instead, the ICR team applied the legally allowed daily value per square meter as a reasonable target. By 2015, the dust level was below the level that the monitoring points could register and thereby considered eliminated. Six dust filters near the ash dump has collected data for years, which was used to assess the result. Indicator relates to PDO Outcomes (a) and (b).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator 5</td>
<td>Land reclaimed for natural habitats, agriculture, or other land use purposes in KEK overburden areas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>0 ha 450 ha 526 ha 653 ha</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date achieved</td>
<td>05/15/2006 12/31/2010 12/31/2014 08/31/2016</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comments</td>
<td>Target scaled-up in 2013 and exceeded by 24% at project closing. It is important to notice the wording “reclaimed for” certain “purposes”, which implies that the project will prepare land for such use as natural habitat or agriculture. Allowing access to the land for such purposes is different, and according to the legal covenants of the project subject to IDA’s approval of a land use plan. See section 1.2. Indicator relates to PDO Outcome (b). Original target achieved in October, 2011 and exceeded by 45%.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator 6</th>
<th>Land reclaimed for natural habitats, agriculture, or other land use purposes in KEK overburden areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0% 55% 68%</td>
</tr>
<tr>
<td>Date achieved</td>
<td>05/15/2006 12/31/2014 08/31/2016</td>
</tr>
<tr>
<td>Comments</td>
<td>Target exceeded by 24 percent. The unit of measurement in percentage was intended to complement the original reclamation indicator in hectares. See also PDO indicator 5 and section 1.2. Indicator added in 2013 and relates to PDO Outcome (b).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator 7</th>
<th>Increase capacities in KEK for continued clean-up operations and environmental good practices in the mining and energy sector (as measured by nr of hectares remediated and reclaimed with KEK own resources)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>Limited capabilities in KEK MESP and MEM KEK staff fully responsible for clean-up and land reclamation operations 127 ha 165 ha</td>
</tr>
<tr>
<td>Date achieved</td>
<td>05/15/2006 12/31/2010 12/31/2014 08/31/2016</td>
</tr>
<tr>
<td>Comments</td>
<td>Target achieved in October, 2010, within the original timeframe. Indicator scaled-up in 2013 and target exceeded by 30%. Original target achieved with the establishment of the Reclamation Department carrying out operations using own staff and equipment. Indicator revised in 2013 to reflect the expertise developed at KEK and define a meaningful target for the on-going work by the Reclamation Department. The target of 127 ha refers to reclamation of overburden areas and is in essence an extension of PDO indicators 5 and 6, i.e. “continued clean-up operations and environmental good practices”. Indicator relates to PDO Outcome (c).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator 8</th>
<th>Increase capacities in MESP for continued clean-up operations and environmental good practices in the mining and energy sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>No ESIA for KPP prepared. Resettlement for Shala neighborhood of Hade village not yet completed in line with ESIA for KPP prepared and disseminated in line with Bank policies and good ESIA for KPP prepared and disseminated in line with Bank policies Draft ESIA for KPP prepared, but not disseminated. Resettlement Completion Report</td>
</tr>
<tr>
<td>Date achieved</td>
<td></td>
</tr>
</tbody>
</table>

viii
| Comments (incl. % achievement) | approved RAP. international practices. Resettlement for Shala neighborhood of Hade village completed in line with approved RAP. and good international practices. Resettlement for Shala neighborhood of Hade village completed in line with approved RAP finalized and publicly disclosed as documented evidence for achievement of the resettlement objective in line with the approved RAP |
| Date achieved | 03/28/2013 | 12/31/2014 | 08/31/2016 | 12/31/2016 |

**Indicator 9:** All found priority hazardous substances from the gasification site safely removed and treated/disposed (tars, benzene, phenols, methanol, oily compounds)

| Value quantitative or Qualitative | 0 tons | 17,545 tons | 21,783 tons | 22,116 tons |
| Date achieved | 05/21/2007 | 12/31/2010 | 12/31/2014 | 08/31/2016 |
| Comments (incl. % achievement) | Target partly achieved. Uncertainties about the specific configuration of the proposed power plant prevented finalization of ESIA. The target for increasing MESP’s capacity was defined in regards to two of MESP’s core responsibilities, namely impact assessments and resettlements, which are important to “continued clean-up operations and environmental good practices in the mining and energy sector. Indicator added in 2013 and relates to PDO Outcome (c). |

**Indicator 10:** Project beneficiaries

| Value quantitative or Qualitative | 0 of which female 0 | 21,500 of which female 10,600 | 21,500 of which female 10,600 |
| Date achieved | 03/28/2013 | 12/31/2014 | 08/31/2016 |
| Comments (incl. % achievement) | Target 100% achieved. Target refers to residents of Obiliq municipality, which were most affected by high dust-levels. The target was achieved by December, 2013 when the wet ash transport system was commissioned and the target for 55 percent of remediation work on the ash dump had been completed. Core Sector Indicator added in 2013 and relates to PDO Outcomes (a) and (b). |
(b) Intermediate Outcome Indicator(s)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Baseline Value</th>
<th>Original Target Values (from approval documents)</th>
<th>Formally Revised Target Values</th>
<th>Actual Value Achieved at Completion or Target Years</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indicator 1:</strong> Mirash mine prepared for sanitary disposal of Kosovo A ash</td>
<td>Mirash Mine unsuitable for ash reception</td>
<td>Mirash Mine prepared for sanitary disposal of Kosovo A ash</td>
<td>Mirash Mine prepared for sanitary disposal of Kosovo A ash</td>
<td>Mirash Mine prepared for sanitary disposal of Kosovo A ash</td>
</tr>
<tr>
<td>Value (quantitative or Qualitative)</td>
<td>Date achieved</td>
<td>05/15/2006</td>
<td>07/01/2009</td>
<td>12/31/2010</td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target 100% achieved. Indicator relates to PDO Outcome (a).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 2:</strong> Reduction of houses at risk from geotechnical instabilities of Kosovo A ash dump</td>
<td>10 houses at risk</td>
<td>0 houses at risk</td>
<td>0 houses at risk</td>
<td>0 houses at risk</td>
</tr>
<tr>
<td>Value (quantitative or Qualitative)</td>
<td>Date achieved</td>
<td>05/15/2006</td>
<td>07/01/2010</td>
<td>07/01/2010</td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target 100% achieved through stabilization Ash dump and Dragodan overburden dump near Dardhishte village. Indicator relates to PDO Outcome (b).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 3:</strong> Preparation of full site clean-up investment plan and adaptation of health and safety regulations and low-cost remediation program</td>
<td>No remediation plan</td>
<td>Preparation of full site clean-up investment plan and adaptation of health and safety regulations and low-cost remediation program</td>
<td>Full site clean-up investment plan prepared and health and safety regulations and low-cost remediation program adapted</td>
<td></td>
</tr>
<tr>
<td>Value (quantitative or Qualitative)</td>
<td>Date achieved</td>
<td>05/21/2007</td>
<td>07/01/2010</td>
<td>03/04/2010</td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target 100% achieved. Indicator added in 2007 and relates to PDO Outcome (c).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicator 4:</strong> Tons of found tar sludge, benzene, methanol, and oily compounds from the gasification site removed and disposed.</td>
<td>0 tons</td>
<td>4,300 tons</td>
<td>4,780 tons</td>
<td>5,109 tons</td>
</tr>
<tr>
<td>Value (quantitative or Qualitative)</td>
<td>Date achieved</td>
<td>05/21/2007</td>
<td>12/31/2010</td>
<td>12/31/2014</td>
</tr>
<tr>
<td>Comments (incl. % achievement)</td>
<td>Target achieved and scaled-up in 2013. Revised target exceeded by 7%. Indicator added in 2007 and relates to PDO Outcome (c).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Indicator 5:
Tons of found tar deposits from the gasification site safely removed and disposed

<table>
<thead>
<tr>
<th>Date achieved</th>
<th>Value (quantitative or Qualitative)</th>
<th>Comments (incl. % achievement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/28/2013</td>
<td>0 tons</td>
<td>Target 100% achieved. Indicator added in 2013 and relates to PDO Outcome (c).</td>
</tr>
<tr>
<td>12/31/2014</td>
<td>2,232 tons</td>
<td></td>
</tr>
<tr>
<td>06/30/2015</td>
<td>2,232 tons</td>
<td></td>
</tr>
<tr>
<td>05/20/2015</td>
<td>2,232 tons</td>
<td></td>
</tr>
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</table>

### Indicator 6:
Tons of found phenol in water solutions from the gasification site safely removed and treated

<table>
<thead>
<tr>
<th>Date achieved</th>
<th>Value (quantitative or Qualitative)</th>
<th>Comments (incl. % achievement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05/21/2007</td>
<td>13,245 tons present in tanks on site Part with highest concentration removed, remainder stored and monitored in reliable tanks 14,771 tons safely removed and treated</td>
<td>Target scaled-up in 2013 and 100% achieved. Indicator added in 2007 and relates to PDO Outcome (c). Original target intended for partial removal.</td>
</tr>
<tr>
<td>07/01/2010</td>
<td>14,771 tons safely removed and treated</td>
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</tr>
<tr>
<td>12/31/2014</td>
<td>14,775 tons safely removed and treated</td>
<td></td>
</tr>
<tr>
<td>06/30/2012</td>
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### Indicator 7:
Environmental and social baseline data available for the ESIA

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<thead>
<tr>
<th>Date achieved</th>
<th>Value (quantitative or Qualitative)</th>
<th>Comments (incl. % achievement)</th>
</tr>
</thead>
<tbody>
<tr>
<td>03/28/2013</td>
<td>No data available</td>
<td>Target 100% achieved. Indicator added in 2013 and relates to PDO Outcome (c).</td>
</tr>
<tr>
<td>12/31/2014</td>
<td>Environmental and social baseline data available for ESIA</td>
<td></td>
</tr>
<tr>
<td>11/30/2015</td>
<td>Environmental and social baseline data available for ESIA</td>
<td></td>
</tr>
</tbody>
</table>

### Indicator 8:
Low carbon growth strategy prepared and disseminated

<table>
<thead>
<tr>
<th>Date achieved</th>
<th>Value (quantitative or Qualitative)</th>
<th>Comments (incl. % achievement)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Revised target 100% achieved. Indicator added in 2013 and relates to PDO Outcome (c).</td>
</tr>
<tr>
<td>12/31/2014</td>
<td>Low carbon growth strategy prepared and disseminated</td>
<td></td>
</tr>
<tr>
<td>02/29/2016</td>
<td>Low carbon growth strategy prepared</td>
<td></td>
</tr>
<tr>
<td>09/30/2015</td>
<td>Low carbon growth strategy prepared</td>
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### G. Ratings of Project Performance in ISRs

<table>
<thead>
<tr>
<th>No.</th>
<th>Date ISR Archived</th>
<th>DO</th>
<th>IP</th>
<th>Actual Disbursements (USD millions)</th>
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<td>Satisfactory</td>
<td>Satisfactory</td>
<td>0.00</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
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<td>03/28/2008</td>
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<td>Moderately Satisfactory</td>
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<tr>
<td>Restructuring Date(s)</td>
<td>Board Approved PDO Change</td>
<td>ISR Ratings at Restructuring</td>
<td>Amount Disbursed at Restructuring in USD millions</td>
<td>Reason for Restructuring &amp; Key Changes Made</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------</td>
<td>----------------------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>06/03/2009</td>
<td>N</td>
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<td>10.12</td>
</tr>
<tr>
<td>05/10/2013*</td>
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<td>S</td>
<td>S</td>
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</tr>
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<tr>
<td>06/30/2015</td>
<td>N</td>
<td>S</td>
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<tr>
<td>Restructuring Date(s)</td>
<td>Board Approved PDO Change</td>
<td>ISR Ratings at Restructuring</td>
<td>Amount Disbursed at Restructuring in USD millions</td>
<td>Reason for Restructuring &amp; Key Changes Made</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------</td>
<td>-----------------------------</td>
<td>--------------------------------------------------</td>
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</tr>
<tr>
<td>02/25/2016</td>
<td>N</td>
<td>S</td>
<td>14.40</td>
<td>Extension of closing date and reallocations between categories</td>
</tr>
</tbody>
</table>

*This date was pulled from the system and could not be changed, but the actual date of Board approval is May 10, 2013.

I. Disbursement Profile

![Disbursement Profile Graph](image)

- Original
- Formally Revised
- Actual
1. Project Context, Development Objectives and Design

1.1 Context at Appraisal
1. In the aftermath of the 1999 conflict, Kosovo was battling a damaged economy, broken trade links, international sanctions, a lack of investment, and weak institutional capacity. Kosovo was placed under the administration of the United Nations Interim Administration Mission in Kosovo (UNMIK), who became the signatory to the Clean-up and Land Reclamation Project (CLRP). Kosovo declared independence in 2008.

2. The 2004 Kosovo Economic Memorandum (KEM) identified the energy and mining sectors as potential sources of economic growth. Kosovo’s energy sector was dominated by the Kosovo Energy Corporation (KEK), a public utility company, which at the time was managed by an international company and operated the entire supply chain from mines, power generation, transmission, and distribution.

3. Under the 2006 Interim Strategy Note (ISN) for Kosovo, the World Bank’s focus was on the long-term development of the energy sector in support of Kosovo’s Lignite Power Initiative (LPI). The CLRP would contribute to the objectives of the ISN, which proposed to lay the foundation for the sustainable development of Kosovo’s high quality lignite resources and power generation capacity, associated environmental and social improvements, and the transparent competitive and fiscally responsible management of Kosovo’s public finances.

4. 98 percent of electricity generation in Kosovo came from two old, inefficient and highly polluting coal-fired power plants near Pristina: Kosovo A (345 MW, 40 year old) in poor condition and the worst single-point source of pollution in Europe; and Kosovo B (540 MW, 27 year old). Rather than backfilling the mine with the coal ash as per international best available techniques, dry ashes were disposed of in an open dump site using spreaders to swirl the ashes in the air, causing the formation of an ash mountain and substantial air pollution.

5. Air pollution from the Kosovo A power plant and its dry ash open dump facility was emitting unacceptable amounts of particulates into the air, a prime public health risk. Wastewaters from the mining and power operations were heavily polluted. Large areas of land used for dumping overburden material prevented other productive community uses. Tons of hazardous chemicals stored at the former gasification site at Kosovo A presented one of the biggest environmental risks in Kosovo. Outdated mining practices, an industrial infrastructure that ignored environmental impacts, and a non-functioning environmental management system were the main factors behind the poor environmental performance in the energy sector.

6. At the time of project preparation, Kosovo A was proposed to be shut down and decommissioned. KEK was financially instable and billing and collection for electricity services were poor. Future plans revolved around building a new coal-fired power plant, Kosovo C, but lack of capacity and private investments, and public resistance to further developments in the energy sector presented big obstacles.

7. The rationale for Bank involvement in the energy sector was to (a) establish enabling frameworks and build local capacity for attracting private sector investments in new power plant and mine operations with modern technologies in a transparent, environmentally and socially sustainable, and fiscally responsible manner; (b) undertake measures to reduce air and water pollution from the existing power plants; and (c) reclaim lands covered by lignite ash piles and overburden material to free land for community development purposes.
1.2 Original Project Development Objectives (PDO) and Key Indicators

8. The objectives of the Cleanup and Land Reclamation Project as stated in the Financing Agreement were to: (a) address environmental legacy issues related to open dumping of ashes on land from KEK’s Kosovo A thermal power plant; (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remove Kosovo A ash dump; and (c) to initiate structural operations in KEK for continued clean-up and environmentally good practice mining operations.

9. According to the legal covenant, no final decision on the use of the land reclaimed pursuant to Component C can be taken without IDA’s prior consent. That implies that while part (b) of the PDO is to free land for community development purposes, access by the community for such purposes is subject to IDA’s approval of a land use plan to be developed in a participatory manner and in compliance with spatial planning legislation in Kosovo.

10. Table 5 in Annex 2 shows the original results framework from the PAD with slight modifications to present the intended indicators and targets.

1.3 Revised PDO and Key Indicators, and reasons/justification

11. The project development objectives and associated key indicators were revised twice: On June 3, 2009 and on March 28, 2013.

12. It should be noted here that the ICR makes reference to the first and second restructuring to mean the two restructurings, which required Board approval (see section H in the Datasheet.) In total, the project was restructured nine times, including eight times for an extension of the project closing date and reallocation between disbursement categories.

13. In the first restructuring of June 3, 2009, part (b) of the PDO was modified as follows: (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remediate Kosovo A ash dump.

14. The justification for the revision of the PDO was based on the selection of an alternative remediation option for the Kosovo A Ash dump in Component B, moving from “relocation of Kosovo A Ash Dump into the Mirash Open Pit Mine” to a reshaping and coverage of the ash dump while leaving it in place. During project preparation, different remediation options were investigated and the full removal option was selected as it was environmentally preferred. Following project approval, detailed site investigations revealed a number of factors, which justified this change of approach: (i) parts of the Kosovo A ash dump was contaminated with hazardous waste, which would be costly and risky to remove; (ii) the ash dump itself provided a reliable barrier against contamination of the underground and groundwater systems; (iii) areas of the ash dump had stratified soft and cemented layers of ash, requiring excavation equipment in much better condition than KEK had available; (iv) it proved difficult to provide adequate measures for dust control during transport of ashes using existing conveyor belts; and (v) pressed by coal shortage in 2008, KEK extended exploitation in the Mirash mine and disposed of the

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2 This date was pulled from the system and could not be changed, but the actual date of Board approval is May 10, 2013. To be consistent, the ICR will make reference to March 28, 2013 throughout the document.

3 Full removal of the ash dump had the advantage that the materials from the reshaping could be used for Mirash Mine reclamation and the land underneath the ash dump - holding significant lignite reserves - would become available.

4 The risk of contamination was foreseen in Project preparation, but could only be confirmed after execution of detailed drilling and site investigation program.
overburden material into the mine, complicating the option to simultaneously dispose of the dry ashes from the Kosovo A ash dump and production line. This prompted a change in the technical design approach from full removal to in-situ remediation of the ash dump site, which included reshaping, coverage and some partial removal of the ash dump. This “adaptive restructuring” had the added advantage of a shorter implementation period, lower costs and lower environmental risks not having to excavate hazardous chemicals, lower health risks given the significant reduction in dust emission levels and mine workers handling of ash material, and it was an easier operation to manage.

15. In the second restructuring of March 28, 2013, part (c) of the PDO was modified as follows: (c) support KEK and MESP to implement continued clean-up operations and environmental good practices in the mining and energy sector.

16. The scope of the project was broadened to include capacity building activities not only in KEK, but also in the Ministry of Environment and Spatial Planning (MESP) in an effort to strengthen their mandate in regards to developments in the mining and energy sector. In this “adaptive restructuring”, the Bank responded to the growing need for technical assistance within MESP to deal with environmental management and monitoring responsibilities. With the addition of Component F, Environmental Monitoring and Management, MESP became the second Implementing Agency of the CLRP.

17. In conclusion, the final PDO of the CLRP was to: (a) address environmental legacy issues related to open dumping of ashes on land from KEK’s Kosovo A thermal power plant; (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remediate Kosovo A ash dump; and (c) support KEK and MESP to implement continued clean-up operations and environmental good practices in the mining and energy sector.

Key Indicators

18. The results framework evolved throughout the life of the project as the project was restructured twice and components were added as a result of the first and second additional financing to widen and scale-up project activities. Described below in chronological order, Table 6 in Annex 2 shows the original and revised results framework side-by-side.

19. On June 28, 2007, additional financing for clean-up of hazardous material at the former Kosovo A gasification site was incorporated as Component E. Three intermediate indicators were added to track progress towards removal of highest priority hazardous substances from storage tanks and partial removal of phenol in water solutions.

20. In the first restructuring on June 3, 2009, the PDO-level indicator linked to Component B was modified. As the approach changed from removal of Kosovo A ash dump to in-situ remediation of the ash dump, the indicator was revised accordingly. Originally, the target value referred to “m³ of ashes removed”. The revised indicator would track the “percentage of ash dump remediated”. Based on an interpretation of the original project design in the PAD, which envisaged completion of 55 percent of the required works (i.e. “initiate and enable”), the same target of 55 percent was applied to the remediation indicator. The indicators were specifically set at a lower number than 100 percent as the aim of the project was to initiate and enable the implementing agency - the mining and electricity company KEK - to perform these works themselves and to make reclamation a permanent activity of the mining company that would continue after project closure.
21. In the second restructuring of March 28, 2013, the results framework underwent a major overhaul:
- The first PDO indicator was reworded to allow for better tracking of results (baseline and target value changed to percentage value).
- A core sector indicator linked to Component B was introduced at the PDO level to track remediation of the ash dump site in hectares, as a companion to the revised indicator tracking the same progress in percentage. The target was calculated as 55 percent of the ash dump size, but due to using 283 ha as the basis of the ash dump size, the target was overestimated. Given that the size of the ash dump is 243 ha (as noted in several places in the same restructuring document) the correct target would have been 134 ha. For consistency, however, the ICR will use the target of 156 ha as entered. At the time of the restructuring, the target had already been met.
- In the PAD and in all other project documentation throughout implementation, there seems to be confusion about whether the original land reclamation target was 450 ha or 650 ha. Strictly adhering to the original results framework in the PAD, the ICR team will apply the target of 450 ha in this final evaluation of achievements. This is also in line with the wording used through-out the PAD to “initiate and enable”. To reflect ongoing work at the time of the restructuring, the target was scaled-up to 526 ha. The revised target was based on a calculation of 55 percent of an enlarged overburden dump area of 957 ha, which became known due to more detailed surveys done as part of implementation, instead of the original 650 ha.
- A PDO indicator linked to Component C was introduced to track land reclamation in percentage, as a companion to the original indicator tracking the same progress in hectares. It is not clear to the ICR team on which basis the target of 55 percent was defined. In interpreting the original intent from the PAD, to “initiate reclamation of 650 ha” with a target of 450 ha, this would imply a target equal to 69 percent. For consistency, the ICR team will refer to 55 percent. At the time of the restructuring, the target had already been met.
- A PDO indicator linked to Component E and measured in tonnage was introduced to reflect the enhanced development impact as the activities were scaled-up to remove all priority – rather than the highest priority – hazardous substances.
- Three intermediate indicators linked to Component E were revised to clarify in more detail the precise substances to be removed, disposed, treated, and exported. Targets were scaled-up as additional financing was made available.
- A PDO indicator linked to Component F was added to reflect capacity building for continued clean-up operations and environmental good practices in KEK. A land reclamation target of an additional 127 ha of overburden areas was entered to reflect that KEK would fully do this work using their own staff, equipment and financial resources.
- A PDO indicator linked to Component F was added to reflect capacity building for environmental monitoring and management in MESP. This would be tracked by a) delivering an ESIA for the new Kosovo Power Plant project, and b) supervising the resettlement of Shala neighborhood in Hade village.
- Two new intermediate indicators linked to Component F were also added to a) make baseline data available for the ESIA and b) to prepare and disseminate a low carbon growth strategy.
- An overall core sector indicator of “Project beneficiaries”, with a sub-indicator “of which females”, was added at the PDO level.
- One PDO-level indicator was dropped to avoid duplication with a similar original intermediate indicator (reduce loss of private property due to geotechnical instabilities.).
- Four intermediate indicators were dropped to remove duplication with PDO-level indicators.
22. On June 30, 2015, the intermediate indicator related to the preparation and dissemination of a Low Carbon Growth Study was revised to “Low Carbon Growth Study prepared”.

23. It should be noted that the original PDO indicator “Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump” never had a defined target nor was it ever tracked, revised or dropped. In an effort to measure project achievements against this original indicator, the ICR team has applied a target of “dust levels below allowed daily value of 300 mg/m²/day” in accordance with local environmental legislation in Kosovo.

1.4 Main Beneficiaries,

24. The CLRP was designed to generate substantial environmental and health benefits.

25. **Elimination of dust:** The primary target group was the 21,500 beneficiaries in Obiliq municipality, who were most affected by air pollution caused by particulate matters arising from the dust.

26. **Hazards due to geotechnical instabilities:** The encroaching ash dump put at risk local households hugging the edge of the dump site. Nearby settlements would benefit from the stabilization of the Kosovo A ash dump by preventing their loss of private property.

27. **Reclamation of land:** The reclamation of overburden dumps would make land available for community purposes such as agriculture, natural habitats, recreation, and resettlement purposes. However, prior to any such dispositions by KEK, a consultative land use plan must be prepared, satisfactory to IDA (legal covenant.)

28. **Removal of hazardous chemicals:** Possibly the single most urgent environmental risk in Kosovo, aging tanks holding tons of dangerous chemicals were stored at the former gasification site. Spillage or leakage could have led to a major environmental disaster. Their safe removal would benefit both the environment and the people of Kosovo.

29. **Capacity building at KEK and MESP:** Officials at KEK and MESP would benefit from training sessions, on-the-job training, international designs and good practice for reclamation, technical assistance, study tours, expert review, exposure to best available technologies and international good practices in environmental regulations, preparation of complex safeguard documents such as the EIA for the hazardous chemical treatment and removal, and the ESIA for the proposed Kosovo Power Project including generation of environmental baseline data, etc, which will strengthen the institutions, improve the environmental performance of the energy and mining sector, and benefit overall environmental and public health outcomes.

1.5 Original Components

30. The project was approved with four components, each of which relates to all three parts of the PDO.

31. **Component A: Preparation of the Mirash Open Pit Mine for Ash Management**
Prepare the Mirash open pit mine to receive and store ash from Kosovo A Power Plant and ash removed from Kosovo A’s open ash dump. Activities include detailed site investigations,
drainage and mine water management system, and adaptation of the ash disposal system to stop open ash dumping and redirect ash disposal to the prepared part of the mine.

32. **Component B: Relocation of Kosovo A Ash Dumps into Mirash Open Pit Mine**
Remove ash and overburden materials from the Kosovo A ash storage facility. Activities include repair of special mining equipment, build open conveyor belt systems, service roads, and access ramps for moving the excavated ash to the disposal site in the mine for proper backfilling.

33. **Component C: Reclamation of Overburden Dump Areas**
Mobilize existing KEK earth moving equipment and reclaim about 4.5 km² of land through reshaping and re-cultivating overburden dump areas.

34. **Component D: Project Management**
Support to KEK to implement the project.

1.6 Revised Components
35. An overview of revised components is presented in Table 3 in Annex 2.

36. **Component A: Preparation of the Mirash Open Pit Mine for Ash Management**
Revised: June 3, 2009. The original project design envisaged transportation of dry ash from the Kosovo A power plant to the Mirash mine through a system of open conveyor belts. In an effort to considerably reduce dust formation and emissions and due to the substantial degradation of the conveyor belt system transporting the dry ash, an alternative wet ash disposal system was proposed and endorsed. The hydraulic ash transport and disposal system required substantial co-funding from KEK (first estimated at €4.0 million, but requiring €7 million in total). Project resources were reallocated to contribute to its installation for the environmental benefits. Meanwhile, KEK paid the remaining of the investment, as the wet-ash system also has substantial economic benefits in terms of less breakdowns compared with the old conveyor belt system allowing for more continuous operation of the power plant.

37. **Component B: Remediation of Kosovo A Ash Dump**
Revised: June 3, 2009. Component B was modified to reflect the alternative option of environmental remediation of the ash dump in-situ with containment measures and reallocation of only those parts of the dump that had stability risks, rather than full excavation, removal and transportation of the ash dump to the Mirash Mine as originally envisaged (see section 1.3).

38. **Component C: Reclamation of Overburden Area**
Revised: March 28, 2013. Activities were scaled-up due to successful achievement of original targets. Additional financing was made available to purchase more tree seedlings to be planted in the reclaimed overburden areas using KEK’s own staff and resources.

39. **Component D: Project Management**
Revised: June 3, 2009 and March 28, 2013. With the addition of Component E, additional resources were made available to KEK for the purposes of implementation, management, and supervision. With the addition of Component F, MESP became the second implementing agency of the CLRP. Additional financing was made available to both KEK and MESP to support implementation efforts.

40. **Component E: Removal of Hazardous Chemicals from Kosovo A’s Gasification Site**
Added: June 28, 2007. Revised: May 10, 2013. Component E, which was part of the original project design, was not included at appraisal due to insufficient funds; but then included as part of
the first Additional Financing. One of the most urgent environmental legacy issues that needed to be addressed was the tons of hazardous waste stored in aging tanks at the former Kosovo A gasification site. Their safe removal would help eliminate one of the most eminent environmental risks in Kosovo. Activities were scaled-up to ensure that all priority substances were removed.

41. **Component F: Environmental Monitoring and Management**
Added: March 28, 2013. Component F aimed at building capacity in MESP to strengthen their mandate and capacity for improved environmental monitoring and management. As part of the Bank’s broader engagement in the mining and energy sector in Kosovo, Component F would support a number of activities in preparation for dialogues on the new Kosovo Power Project (KPP) as well as supervise the implementation of a planned resettlement. Including air, soil and water monitoring and data collection, ESIA for proposed KPP, monitor the implementation of a Resettlement Action Plan (RAP) for Shala neighborhood of Hade village, and low carbon growth study. It is important to reiterate that the project did not cause nor finance the resettlement; it only supervised MESP’s responsibility to implement the RAP, which resulted from on-going mining activities for the supply of coal to Kosovo A and Kosovo B power plant.

1.7 Other significant changes
42. **Funding allocations:** The original project was approved with a financing gap of US$2.71 million. In December 2006, the Netherlands Ministry for Development Cooperation agreed to make available a grant in the amount of US$4.33 million equivalent to cover the gap. In the first and second additional financing, another US$5 million (IDA grant) and US$4.2 million (IDA credit) was made available. KEK, in addition to the US$3.15 million originally committed, financed €7 million to implement the wet ash disposal system and contributed additional US$3 million in reclamation and project support. This raised project costs from an original estimate of US$11.35 million to a total of over US$35 million.

43. **Design, scope and scale:** As described above, the project underwent significant changes to its design, scope and scale – some of which had been anticipated at the preparation stage. The project was successful in attracting considerable co-financing for existing and new activities. It was able to expand the reach of clean-up and reclamation activities and take advantage of the high interest in developing the mining and energy sector to promote good environmental practices and build institutional capacity both in the industry and the ministry. The scope was expanded from an early focus on the mining sector to also include the energy sector, as the Bank engaged in a broader dialogue with multiple development partners around plans for a new power plant.

44. **Implementation schedule:** The project closing date was extended eight times from December 31, 2010 to August 31, 2016, a total of 5 years and 7 months. A policy waiver for OP13.20 by the Bank Board of Executive Directors was obtained with the approval of the second additional financing as the new closing date extended beyond three years of the original closing date.

2. **Key Factors Affecting Implementation and Outcomes**

2.1 **Project Preparation, Design and Quality at Entry**
45. Drawing on lessons learned in other Kosovo projects, the design was kept simple with clear development objectives and sound implementation arrangements with early stakeholder participation. These are the key success factors at the preparation stage that help explain why and how the project achieved targeted outcomes.
46. The Bank’s recent experience in Kosovo had highlighted the importance of building ownership in local institutions, preparation of comprehensive implementation arrangements, selection of competent consultants, detailed reviews to ensure quality of consultants’ outputs, and wide consultations with local institutions, donors and other stakeholders. All of these good practices were taken into account in preparing the CLRP. According to the PAD, extensive consultations were undertaken with officials and managers from the Provisional Institutions of Self-Government (PISG), KEK administrators, and the donor community.

47. Building local capacity of KEK equipment and expertise to enable project implementation by the enterprise’s own staff, in contrast to hiring an international firm, was emphasized at the preparation stage. This would allow for institutional change of old industrial practices in favor of improved environmental performance and continued clean-up operations.

48. KEK showed early commitment to the project by (i) preparing an EIA and performing drilling tests for pre-feasibility studies, (ii) by dedicating all existing mining and earth moving equipment necessary for project implementation, and (iii) by allocating part of the Mirash mine to receive intended dump material and ongoing production of ashes from Kosovo A power plant.

49. A number of design issues are worth noting. First, the project was designed with a financing gap in mind. In consideration of this gap and the opportunity to close it, the flexible design had pre-identified possible savings, such as less equipment to be repaired, which would result in a longer implementation period for the activities and a greater reliance on internal KEK resources, but would still allow for the achievement of project objectives. Second, the technical solution of redirecting the open conveyor belts for transfer of dry ash from the power plant to the mine was disregarded soon after project approval. The alternative hydraulic ash handling system was very costly (see section 1.6), and given the limited project funding available it was not a feasible investment option for a plant that was earmarked for early closure\(^5\). Third, the analysis of alternatives in fact considered reshaping the ash dump, but the alternative of complete removal was initially preferred, as the costs would be the same, but removal would allow future development of the lignite deposits underneath the dump. Although the possibility was raised in the pre-Feasibility Study and the EIA during preparation that the underground below the ash dump could be contaminated with phenols, it was only during the detailed site investigations following project approval (a US$600,000 study), that phenols were discovered within the ash layers, having been co-disposed with the ash. Finally, the original results framework as approved in the PAD lacked some specific and measurable targets (see section 2.3), although most of the targets could be deduced from the arrangements for results monitoring table in the PAD.

50. It is important to keep in mind that pollution management projects dealing with clean-up and improved performance need to rely on extensive site investigations –as per international good practice- typically executed following project approval as the cost of these investigations are prohibitively expensive at the preparation stage. Their costs are more easily absorbed into the overall cost of the project, though it requires flexible and close supervision to allow for modifications of the design to fit the reality on the ground.

51. A financial management assessment was conducted for the project and found that KEK had satisfactory procedures in place to ensure proper financial accountability of the CLRP. The Kosovo Operational Procurement Review, completed in 2004, assessed the ability of

\(^5\) Later, plans for the new power plant became substantially delayed, and KEK decided the hydraulic ash system was worth the investment.
implementing agencies carrying out procurement processes under current conditions at “high risk”. To mitigate these risks, the implementation plan stipulated that Bank procurement specialist would provide (i) training to PMU and project related staff, (ii) Standard Bidding Documents, and (iii) prior and post reviews of procurement actions.

52. The project was classified as a safeguards category “A” and triggered OP 4.01 Environmental Assessment. Predicted environmental impacts were related to construction works and to the transport of hazardous materials from the gasification plant for incineration if this activity would be included in the project at a later stage. Project activities would not require any land acquisition or resettlement; hence OP 4.12 was not triggered at the project preparation stage (only later in the second project restructuring in 2013). Neither was OP 4.37 on Safety of Dams triggered as the project was designed to deal with ash disposal in a dry manner (nor was it triggered with the introduction of a wet as system as the 1:1 ratio of ash and water allows the water to drain and causes the ash to harden, thereby restoring the mine for proper land reclamation).

53. In hindsight, despite the fact that most of these risks were effectively mitigated, implementation delay due to the prevailing country context and issues regarding procurement and safeguards still arose during the implementation phase (see Section 2.2 and Section 2.4). However, it would appear that no further measures by the project team taken at the preparation stage could have prevented these problems.

54. Overall, given the Bank’s broad international experience in the mining and energy sector and with economic development in post-conflict zones, the Bank was in a good position to assist the Kosovar authorities in rehabilitating the power sector and to support KEK in completing the project successfully.

2.2 Implementation

55. In summarizing the implementation of the CLRP, and the first additional financing (FAF) and second additional financing (SAF), it’s important to keep in mind the overall backdrop of the prevailing country context over the decade from 2006 to 2016 when the project was implemented. As a new and emerging democracy, political instability of the government, hand-over of the government function from UNMIK to the Government of Kosovo, frequent change of ministers, and the absence of officials during prolonged appointment periods came to define day-to-day operations for PMU staff. It also bears mention that KEK management underwent transformation from being under an international caretaker company with foreigners in charge at the beginning of the project, to Kosovars being appointed to leadership positions and taking charge of KEK. As such, it is highly commendable how the project came to support the development of institutions in their infancy and to leverage sustained growth and integration of environmental concerns into the mining and energy sector.

56. The project enjoyed early implementation support from the Bank and the PMU. There was an eight months delay in declaring the project effective due to pending finalization of the sub-granting agreement between UNMIK, Kosovo Trust Agency (KTA), and KEK. With a retroactive funding facility in place and a proactive PMU at KEK, implementation activities began in September 2006 with contracts signed for US$275,000 and others in advanced stage of procurement. Effectiveness was declared on February 28, 2007.

57. During the first year of operation, the project was able to attract substantial additional funding. First, additional funds in the amount of US$4.33 million from the Government of The Netherlands (GON) were made available to close the financing gap, which was included in the
original project design. Shortly after, an additional grant of US$5 million from IDA was allocated in support of the initially intended removal of hazardous chemicals from the former gasification site. This became Component E in the first CLRP additional finance project paper. Effectiveness was declared on December 11, 2007. This allowed for a substantial broadening of activities from the original IDA Grant of US$5.5 million and doubled the size of the project.

58. The progress towards achievement of the Project Development Objective (DO) and Implementation progress ratings (IP) were downgraded to MS in early 2008, when the site investigation confirmed that the ash dump was contaminated with chemicals and recommended a different technical solution in Component A and B. KEK management demonstrated ownership of the project, expressing their support and financial commitment to the recommendations of the site investigation, including installation of a hydraulic ash handling system. This led to the first project restructuring of June 3, 2009.

59. With those changes, the nature of the technical works for the remediation partially shifted from a focus on use of special mining equipment for the planned excavation of the ash dump towards wider reclamation efforts with use of earth moving equipment and investment in a new ash disposal system. This prompted a repositioning of the PMU within KEK with reporting channels broadened from the Mining Division to also include the Generation Division.

60. A Mid-Term Review supervision mission was carried out on February 15-19, 2010. Chief among the points for discussion was the significant delay observed for component A, B, and C due to (i) budget overrun for implementation of the hydraulic ash transport system, which necessitated a second investment decision by KEK Board of Directors, and (ii) complications in arranging contractual payment for earth moving equipment, which led to a 7 months delay in delivery and the loss of the 2009 summer season for reclamation of overburden areas.

61. The DO and IP were upgraded to Satisfactory in 2011 with the approval by KEK management to finance the hydraulic ash system. Committing €7 million to the investment, the wet ash system was fully commissioned by December, 2013.

62. For Component E, following the completion of a comprehensive EIA process in 2010, delay in exporting hazardous material was mainly caused by the need to sign bilateral agreements with the governments of countries to which the chemicals would be exported for incineration and with all “transit” countries, since Kosovo could not ratify the Basel Convention regulating international transport of hazardous waste as it is not a member of the United Nations. All targets were met by end of 2012, thereby meeting the objectives of the first additional financing.

63. In June, 2012 a request was received from the GOK proposing now under IDA Credit terms additional financing to further scale-up existing cleanup and land reclamation activities started under CLRP, as well as to fund new activities associated with the environmental and social impact assessment for the KPP and with strengthening the mandate and capacity of MESP (Component F). This led to the second additional financing of US$4.2 million and a second grant from the GON in the amount of US$1.2 million, tripling the project size from its original scope.

64. The Operational Risk Assessment Framework (ORAF) recognized the reputational risks posed (i) by the monitoring of the implementation of the RAP, as there were outstanding issues from a previous resettlement by UNMIK, which could cast a shadow on the new resettlement process as well as the possibility that the new RAP might be poorly implemented, and (ii) by the Kosovo Power Project, as coal-fired power plants were controversial and often openly challenged
by NGOs/CSOs. Mitigation of these risks was linked to the design of a Panel of Experts, who in their technical capacity would assist the PMU and review consultant outputs.

65. The implementation of Component F was challenging from the start. The resettlement process was in breach of the RAP and the legal covenants by December, 2013, prompting the Bank to threaten to invoke its right to suspend disbursements. The issue was resolved when KEK approved additional payments for financial assistance towards paying rent to 21 families temporarily relocated before moving into new housing units under construction.

66. Progress on completing the New Hade resettlement site was slow. Housing construction by residents and completion and repair of water, sewage, and electricity infrastructure by MESP proceeded with great delay. In June, 2015 a complaint was submitted to the Inspection Panel (See section 2.4). While 52 households had obtained land titles in New Hade village, only 12 households were residing at the new site at project closing.

67. Bank monitoring of the RAP implementation remained steadfast and engaged. It is noted that the Bank used every management letter sent to the GOK since October, 2013 as an opportunity to raise issues related to the RAP as well as other important on-going resettlement issues\(^6\) to the highest level of attention.

68. Implementation of the ESIA also experienced delay. Subject to intensive review by the PMU, Panel of Experts, Bank staff, and the Stakeholder Review and Monitoring Committee, the draft was significantly overhauled and revised multiple times. Uncertainties remained to the end about the specific configuration of the power plant for the proposed KPP. This prompted short interval extensions of the project closing date towards the end of the project. However, as Bank teams and the GOK continued to discuss the plant size proposed by the investor, the project closed without the draft ESIA disclosed or publicly consulted\(^7\).

69. Component F was rated MU from its introduction in ISR 12 (August, 2013) until ISR 17 (June, 2016), two months before project closing. It was upgraded to MS in the last ISR 18 (August, 2016) with the completion of all activities except for the public disclosure of the ESIA.

70. In summary, project implementation in post-conflict Kosovo was successful in motivating the counterpart, scaling-up the project, and attracting substantial co-financing, which leveraged the project to have a transformational impact on the institutional capacity for environmental management, particularly in mining operations.

71. The project achieved the development objectives and exceeded most project indicators. This was accomplished through two PMUs with motivated and competent staff and close supervision from a highly responsive Bank team. It is commendable that the collaboration between Bank and PMU teams continued to operate with commitment and efficiency to handle unexpected implementation challenges.

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\(^6\) Including advice on: interpretation of Resettlement Policy Framework; proper allocation of responsibilities between KEK, MESP, and municipality; expansion of Sibovec mine; future resettlement of Shibitulle village and Grabovci I Poshtem village; concerns surrounding definition of economic zone in the New Mining Plan; recommendations from First, Second, Final Resettlement Reports.

\(^7\) As per the project paper for the Second Additional Financing and restructuring, the objective of the ESIA for the KPP was to inform the decision-making process of the proposed investment and increase the monitoring and management capacity of MESP. It was not foreseen to be the final ESIA, which is the responsibility of the winning private investor.
2.3 Monitoring and Evaluation (M&E) Design, Implementation and Utilization

72. M&E design: The original M&E framework had sufficient baselines and targets, which could be deduced from the arrangements for results monitoring table. One PDO indicator (#4) did not appear in the arrangements for results monitoring.

73. M&E implementation: The results framework was thoroughly revised in the 2013 restructuring, which made monitoring and evaluation of project achievements more meaningful and measurable against linked PDOs. The project team was careful to interpret the original intent of each indicator included in the PAD and to strengthen its measurability against fixed targets. The project team also added new indicators and revised existing targets upwards to reflect continued work by the implementing agency exceeding original targets. For the hazardous waste treatment and removal, information on progress was obtained from the contractor and supervising engineer, through the PMU.

74. The responsibility to carry out ongoing M&E activities was placed within the KEK PMU. As the works were implemented by KEK itself rather than by external contractors, this was the appropriate manner for data collection. KEK reported on the progress of the amount of hectares of remediated ash dump as well as reclamation works in the overburden dump areas. In addition, a systematic monitoring system consisting of six dust collection points with filter equipment installed were sampled manually on a weekly basis. These monitoring data served as a control measure for planned remediation of the ash dump and improved ash disposal. The 2013 results framework restructuring would have benefited to include a target and indicator for air quality. The information was sufficient for informing the implementation support, resource allocation and supervision activities.

75. M&E utilization: Three continuous and automatic air monitoring stations, financed by the project and erected in the vicinity of Kosovo A power plant and the Mirash mine has produced a significant amount of data, which has been used as a baseline for the ESIA, and is now being maintained and utilized by KEPA, including for the section on air quality in the annual State of the Environment Report.

76. Future evaluation: As part of the detailed site investigation, a water quality survey of the ash dump itself did not detect any significant contamination of groundwater and surface water. Going forward, a future evaluation of the project could potentially look at groundwater pollution. The design of the remediation of the ash dump was such that there would be no further infiltration of ash pollutants into the groundwater (“store and release cover”). However, unequivocal proof of this natural process would take years to produce, as continuous monitoring of downstream water sources would be required to determine if any contamination had occurred and what other sources of water pollution there might be in the area also influencing water quality.

2.4 Safeguard and Fiduciary Compliance

77. Hazardous chemicals found in Kosovo A ash dump. During the early design phase of project implementation, a full site investigation was completed together with a detailed EIA/EMP for the ash dump remediation and overburden reclamation and approved by the WB. A couple of findings are worth noting as they relate to the project development objectives and laid the foundation for the first project restructuring:

- Contamination of the ash dump by chemicals from the former gasification plant were not originally expected or found during initial drilling. The possibility for dumped phenols in the mining galleries underneath the ash dump was considered as a possibility as it had
happened in other old mine shafts. But the full site investigations demonstrated that phenol and other by-products had also been discharged within the ash dump;
- A water quality survey of the ash dump itself did not detect any significant contamination of groundwater and surface water by the ash nor by waste products from the gasification plant found within the ash dump;
- The properties of the ash, fine grain sizes and high adsorption capacity, apparently cut off the migration path for contaminants, and ash could represent a very effective containment for the tar deposited;

78. The CLRP project team was proactive in adopting the main recommendations in the site investigation to (i) undertake minimal mass removal on the ash dump to avoid further slope movements of the overburden area, (ii) cover the contaminated parts of the ash dump to avoid penetration and contamination of groundwater from harmful substances, and (iii) rearrange Kosovo A ash removal process to hydraulic transport (wet ash system) and (iv) process the restructuring to the PDO, requiring Board approval.

79. The CLRP-FAF for adding Component E Hazardous Materials Clean-up at the Gasification Site included a similar legal covenant obliging the implementing agency to execute a second EIA with preparation of detailed design for treatment and removal of chemicals to be approved by the World Bank prior to start of any works. This detailed EIA was also prepared, publicly disclosed and consulted in line with WB policies.

80. Inspection Panel Investigation Report. On June 12, 2015 the Inspection Panel received a complaint regarding resettlement and land issues related to three World Bank operations in Kosovo, including the proposed KPP and the CLRP-SAF. The complaint was filed by residents of Hade Village, New Hade resettlement site, and Obiliq Municipality, and CSOs in Kosovo.

81. None of the resettlements cited in the Request or the Inspection Panel’s report result from Bank-supported projects, but rather from ongoing mining activities in Kosovo. The CLRP did not cause nor finance the resettlement or infrastructure at the resettlement; it only monitored those responsibilities within MESP.

82. Importantly for this ICR, the Inspection Panel notes that monitoring and supervision under the CLRP-SAF was in compliance with OP/BP 4.12. However, the Inspection Panel recognized the real and often severe harm caused by mining operations and the impact of protracted resettlement processes. In this case, the RAP was prepared under the Bank-financed LPTAP in 2011. Two years later, monitoring of the RAP was eventually folded into the CLRP-SAF in 2013. The Inspection Panel report points to the capacity constraints of the implementing agency and acknowledges that the delay may have compromised the Bank’s ability to recommend solutions to the Government at a critical stage in the process.

83. In Management’s response to the Inspection Panel Investigation Report, it proposed three follow-up actions: (i) repair 200-meter section of clogged sewage, (ii) provide technical assistance to revise the RPF, and (iii) organize workshop with key government stakeholders and KEK to discuss recommendations by end of February, 2017.

84. All follow-up actions have been completed by the project team. The ICR team has obtained confirmation from MESP that the sewage has been repaired as of December, 2016. The ICR team also notes that the Bank team during the ICR mission took every opportunity available to explain and discuss with all relevant stakeholders critical issues regarding the need to revise the RPF. A workshop to provide technical assistance and discuss recommendations was held on
February 14th, 2017 with wide government participation. Based on the results of the workshop, a technical advisory note will be finalized and shared with GOK. It is important to note that only the sewage repair is directly linked to the CLRP, while the other two activities are dealing more broadly with land acquisition and resettlement practices in the mining sector.

2.5 Post-completion Operation/Next Phase
85. During the ICR mission, it was obvious that continued clean-up operations have been fully institutionalized in KEK. During a site visit, KEK staff from the Reclamation Department was engaged in finalizing the remediation of the last 30-40 ha of the Kosovo A ash dump. Relations with local communities living near the reclaimed ash dump and overburden areas have improved and the area near the ash dump is experiencing revitalization. KEK is also fully operating, financing and maintaining the wet ash hydraulic system.

86. The public sector in Kosovo is still heavily dependent on assistance from the international donor community. While local expertise and capacity deepens with every project, funding for implementation and maintenance in the mining and energy sector has to be continuously sought.

87. The Bank, for its part, continues to play an engaging role in the mining and energy sector in Kosovo. While the Bank has made no decisions so far on its potential support to the Kosovo Power Project, on-going discussions and preparatory studies are building the foundation upon which future decision-making will be based.

3. Assessment of Outcomes

3.1 Relevance of Objectives, Design and Implementation
88. Relevance of objectives: High.
89. Relevance of design: Substantial.

90. The project is based on a proper diagnosis of development priorities. The need to rehabilitate the mining and power sector was a high priority for the GOK at the time of appraisal and remains true today. The CLRP came on the heels of a major conflict and decades of outdated industrial practices and environmental neglect. Continued supply of electricity was essential for social and economic reasons, including for heating during the winter months, and to build Kosovo’s economy and create jobs.

91. As the GOK prepares for the next phase of investments in lignite coal mining and generation, the power sector is one of the key priorities outlined in the latest National Development Strategy for 2016-2021. The strategy “aims to provide reliable power supply that will improve the conditions of doing business, facilitate increased private investments […] and improve people’s wellbeing.”

92. More specifically, the Ministry of Economic Development (MED) in Kosovo has developed an Energy Strategy for 2013-2022. The three pillars of the strategy speak directly to the objective of the current project in addition to being aligned with a potential follow-on operation in the KPP: “Security of sustainable and quality supply”; “restructuring of the energy sector”; and “due consideration for environment protection and social issues”.

93. The first Country Partnership Strategy between the GOK and the World Bank for the period FY12-FY15 also provides evidence of high project relevance. Pillar 1 draws attention to
the continued need to “accelerate broad-based economic growth and employment generation” with focused attention on supporting the energy infrastructure, and Pillar 2 seeks to “improve environmental management” supporting the government in increasing energy efficiency and reducing environmental hazards. The forthcoming Strategic Country Diagnostic and Country Partnership Framework also place a significant emphasis on promotion of reliable energy and natural resources management.

94. The component design and responsive implementation allowed the project to stay relevant to emerging needs on the ground.

95. The project was designed with emphasis on building local capacity, technical expertise, and institutional ownership, which was suitable given the objective for on-going reclamation work to become a permanent activity in KEK’s mining practice. In the PMU, administrators and managers have received training on procurement and financial management enhancing their capacity to manage large-scale investments such as this project. At the company level, training on operation and maintenance of supplied equipment has strengthened the technical expertise of staff members and of the Reclamation Department, which was formed under the project. These outcomes will benefit the next phase of development in Kosovo’s power and mining sector, as the true impact of the project has been the transformation of environmental legacy issues and outdated mining and ash-handling practices by the industry.

96. Particularly in view of the EU accession process, the investments and capacity building for land reclamation under CLRP are highly relevant to Kosovo’s move towards meeting international standards. Mine reclamation is an integral part of BAT for mines.

97. The original PDO was too narrowly worded with a focus on one technical solution to meet the objective (see Section 6). The project team was responsive in revising the PDO early on when the site investigation recommended a different technical solution, as well as in fulfilling requests for additional activities and opportunities for scale-up, all while underpinning the original project development objectives. As such, the project design and implementation has stayed highly relevant to achieving Bank and country development objectives throughout the lifespan of the project.

3.2 Achievement of Project Development Objectives

Original Objectives (as approved)

98. The only part of the original PDO, which necessitates a separate assessment of achievements relates to Outcome (b), specifically the part that aims to “enable KEK to remove the Kosovo A ash dump.” The decision to change from removal of the ash dump to in-situ remediation meant that the ash dump would remain in place. Therefore, achievement of this original objective is unsatisfactory.

99. Achievements of the remaining parts of the original objectives are assessed as part of the revised objectives, as the second change to the PDO added to the overall project objectives (not revising or detracting from them).

Revised Objectives (following the first and second level one restructurings)

100. The project achieved stated development objectives and exceeded the targets of most indicators. First, it addressed environmental legacy issues related to open dumping of ashes on land from KEK’s Kosovo A thermal power plant by directing 100 percent of coal ash produced at Kosovo A power plant to the dedicated part of the Mirash mine by way of the hydraulic ash handling system, which reduced dust levels of the ash handling to well below the daily allowed
value and even to below the level where it can be measured. Second, it enabled KEK to free land for community development purposes currently taken by overburden materials by reclaiming 653 ha of land, equal to 68 percent of the area, and enabled KEK to remediate Kosovo A ash dump by remediating 179 ha of the ash dump, equal to 74 percent of the area. Finally, it built capacity in KEK and MESP to implement continued clean-up and environmentally good practices in the mining and energy sector by (i) creating a Reclamation Department with more than 50 staff members that is now a fully integrated part of KEK operations and that has reclaimed an additional 127 ha of former overburden dump areas using own fund, staff, and equipment; (ii) removing all priority hazardous chemicals from the former gasification site, 22,116 tons in total; and (iii) strengthening the review and monitoring mandate of MESP regarding environmental and social impacts of investments in the power sector.

101. **Outcome A: Address environmental legacy issues related to open dumping of ashes on land from Kosovo A thermal power plant.** Rating: High.

102. Outcome A is directly associated with outcomes from the activities completed under Component A and B, i.e. halting the practice of open dumping of coal ashes and remediating the ash dump itself. By preparing part of the Mirash mine to receive ash slurry from the power generation facility and by supporting the installation of a hydraulic ash handling and transport system with pipelines leading to the dedicated part of the mine, the practice for the last 50 years of openly dumping dry ash by using a spreader sitting atop of the ash dump has come to a complete stop as of December, 2013 when the facility was fully commissioned in a ceremony attended by public officials.

103. **Indicator 1: Percentage of ash disposal that complies with environmental good practice and is redirected from open dumping on the Kosovo A Dump to the Mirash mine: 100 %.**

104. 100 percent of coal ashes from Kosovo A are now disposed of directly into the Mirash mine in a wet manner, which eliminates dust arising from the transport and final disposal of the ashes. As the ash slowly hardens in a cemented form, the water is absorbed in the mix, which allows for the mine to be restored by covering with overburden material and top soil and eventually to be fully reclaimed for other productive uses.

105. Given that the technical solution of a wet ash disposal system is far superior to the originally intended redirection of the dry ash conveyor belts and complies with environmental good practice, the ICR team rates the achievement of this outcome High. Installing the hydraulic ash system required a highly leveraged investment and resulted in a significantly improved environmental performance of Kosovo A, hence the project was successful in achieving above and beyond the originally planned fulfillment of the PDO. Results video: http://www.worldbank.org/en/news/feature/2014/03/10/kosovo-open-ash-dumping-practice-ends.

106. **Outcome B: Enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remediate Kosovo A ash dump.** Rating: High.

107. Outcome B is directly associated with outcomes from the activities completed under Component B and C. By undertaking detailed site investigations and designs, by supplying earth moving equipment, by training environmental staff, and by supporting and mainstreaming project activities into KEK operations through the establishment of a Reclamation Department, the project enabled KEK to remediate the ash dump and reclaim land from overburden dump areas
beyond original and revised scaled-up targets. This has freed the land for community purposes (see section 1.2 for details about access to freed land).

108. Indicator 2: Remediation of Kosovo A Ash Dump, eliminating dust problems and pollution infiltration from the ashes into groundwater (%): 74%.

109. Indicator 3: Contaminated land managed or dump sites closed under the project: 179 ha.

110. The original target to remediate 55 percent of the 243 ha large Kosovo A ash dump was achieved in November, 2010, within the original timeframe. By project closing, a total of 74 percent of the ash dump was remediated. This achievement exceeds the target of PDO indicator 2 by 35 percent. Completion of the remaining 30-40 hectares of the ash dump is planned by KEK with its own resources after project closing and on track for next winter season 2017/2018.

111. In hectares, a total of 179 ha of the Kosovo A ash dump site was remediated, i.e. closed. A scaled-up target of 156 ha was set in the 2013 restructuring, which had already been met at that point, and by project closing this target of PDO indicator 3 was exceeded by 14 percent.

112. Remediation of the ash dump has eliminated dust problems (see Indicator 4 below). Weekly readings of six manual monitoring points near the ash dump confirm that dust levels are so low that they are barely measurable (Figure 3).

113. Remediation has been undertaken in accordance with best available techniques to ensure that no further contamination of ground water will take place from the ash dump. The amount of overburden material that covers the ash dump is sufficiently large to form a “store and release cover”, where all rainwater is absorbed and subsequently evaporated. To the extent that the remaining part of the ash dump will be remediated to the same standard as hitherto, groundwater contamination from the ash dump is unlikely.


115. Indicator 4: Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump (mg/m²/day): < 100 mg/m²/day.

116. Remediation of the ash dump has had a measured effect on dust levels, which since December 2013 has been well below the daily allowed value of 300 mg per square meter per day.
Figure 3: Dust levels near Kosovo A ash dump, 2011-2015

117. Figure 3 shows weekly readings of dust levels in six monitoring points near the site. Samples were analyzed for weight and granulometry and served as a control measure for planned improvements of the ash dump operations. The graph shows the drastically decreased level of dust by the end of 2013 when the wet ash system was commissioned. By 2015, the dust level was below the level that the monitoring points could register. The result fully satisfies the target of PDO indicator 4.

118. Indicator 5: Land reclaimed for natural habitats, agriculture, or other land use purposes in KEK’s overburden areas (ha): 653 ha.

119. Indicator 6: Land reclaimed for natural habitats, agriculture, or other land use purposes in KEK’s overburden areas (%): 68%.

120. The original target to reclaim 450 ha of the 650 ha large overburden dump area for community purposes such as natural habitats and agriculture was achieved in October, 2011. A scaled-up revised target of 526 ha was set in the 2013 restructuring, which had already been met at that point. By project closing and per the latest ISR, a total of 653 ha of overburden areas had been reclaimed, exceeding the original target by 45 percent and the scaled-up target by 24 percent.

121. In percentage, a total of 68 percent of the larger 957 ha overburden area was reclaimed. A target of 55 percent was set in the 2013 restructuring, which had already been met at that point. By project closing and per the latest ISR, this target was exceeded by 24 percent. While no land reclamation target was defined as a percentage in the PAD, it is possible to deduce that the original intent was to reclaim 69 percent of the then defined overburden dump area of 650 ha. Even as the baseline overburden dump area was enlarged, the final achievement was in proportion to the originally intended scope.

122. The results fully satisfy the targets of PDO indicators 5 and 6. The land reclamation involved a number of different activities, including the detailed design to investigate in which area works would be required, physical reshaping of heaps and slopes, construction of main and minor access roads, installation of a surface drainage system, removal of illegally dumped trash, and planting of trees and mixed vegetation. While the project planted over 100,000 tree seedlings, the survival rate of those trees is relatively low (Lizmir overburden area estimated at 87%, but Kalaja overburden area only 60%). There were a variety of reasons for this, such as weed competition, a fire, cows and rabbits. KEK hired a guard to protect the seedlings better, but the survival rate of the
first Kalaja overburden area was still low. For the second area, more robust seedlings were purchased (see Annex 7 for more details in the Borrower ICR).

123. **Outcome C: Build capacity in KEK and MESP for continued clean-up and environmentally good practices in the mining and energy sector.** Rating: Substantial.

124. Outcome C is associated with outcomes from Component C, E and F. By building local capacity through staff training, technical assistance and supervision, and expert reviews, the project has initiated the establishment of a Reclamation Department of more than 50 staff in KEK, strengthened the mandate of MESP regarding environmental and social impacts of investments in the power sector, and removed all priority hazardous chemicals from the former gasification site.

125. **Indicator 7: Increase capacities in KEK for continued clean-up operations and environmental good practices in the mining and energy sector (ha): 165 ha.**

126. An additional 165 ha of overburden dump areas were reclaimed using KEKs own staff, equipment, and financial resources as a measure of their increased capacity in land reclamation, which were non-existent before project start. The 165 ha is reached by adding the baseline in 2013 of 69 ha plus additional hectares remediated in the Ash dump of 23 ha and plus additional hectares reclaimed in the overburden areas of 73 ha. A measurable target of 127 ha was set in the 2013 restructuring to reflect the original intent of “KEK staff fully responsible for clean-up and land reclamation operations” as defined in the PAD. The target was achieved by July, 2013 and by project closing the target was exceeded by 30 percent.

127. The achievement is evident of the momentous institutional capacity for improved environmental management, which has developed at KEK. After 50 years of dumping dry ash on open land, KEK established the Reclamation Department to carry out on-going reclamation work, backfilling the depleted mine fields with wet ash and overburden material. The reclamation department has grown to encompass over 50 staff member, who possess the necessary technical expertise and equipment to continue clean-up operations as an integrated business practice. This is the true expression of increased capacity in KEK, which has resulted from the project.

128. **Indicator 8: Increase capacities in MESP for continued clean-up operations and environmental good practices in the mining and energy sector (text): ESIA for KPP prepared and resettlement of Shala neighborhood of Hade village completed.**

129. As per the targets set when the indicator was introduced in the 2013 restructuring, the project supported MESP in (i) completing a draft ESIA for the proposed KPP and in (ii) monitoring the completion of the implementation of a RAP for Shala neighborhood of Hade village. Together, this was an expression of the increased capacity of MESP to review and monitor environmental and social impacts related to investments in the mining and energy sector.

130. The target “ESIA for KPP prepared and disseminated in line with Bank’s policies and good international practices” was partially achieved. The draft ESIA was completed in July, 2016. As there is on-going discussion between the GOK, WB, and potential investors as to the size and specifications of the proposed KPP, the ESIA cannot be completed, disclosed, nor publicly consulted upon yet. As such, the ESIA was prepared, but not disseminated.

131. The target “Resettlement of Shala neighborhood of Hade village completed in line with approved RAP” was achieved. The final RAP completion report was delivered in July, 2016. While the Shala resettlement process became subject to an investigation by the Bank’s Inspection
Panel, the conclusion by the IP and management was that monitoring and supervision was carried in compliance with the OP/BP 4.12 (see section 2.4). All pending action points outlined in the Management Response have been completed by the time of submitting this ICR.

132. In addition, numerous training sessions were provided to staff from KEK, MESP, KEPA, MOF, MED and other partners on resettlement planning, land acquisition, lignite-fired power plants, open cast mining, ESIA, monitoring, procurement, etc. with study tours to Germany and Poland. For an overview, see Annex 2.

133. These achievements satisfy PDO indicator 8. However, perhaps the most significant impact of the activities completed under Component F is a deepening of MESP’s commitment to environmental and social management in the mining and energy sector, and a strengthening of MESP’s mandate regarding investments in the power sector going forward. This is evidenced from the activities, which are ongoing at MESP to revise the expropriation law to make an explicit link to the RPF, and a growing interest to focus on environmental and social issues in the mine area.

134. Indicator 9: All found priority hazardous substances from the gasification site safely removed and treated/disposed (tars, benzene, phenols, methanol, oily compounds) (tons): 22,116 tons.

135. The original target to remove, treat, and dispose of 4,300 tons of tar sludge, benzene, methanol and oily compounds and 13,245 tons of phenol in water solutions was achieved in 2012. A revised and scaled-up target of 4,780 tons of tar sludge, benzene, methanol and oily compounds, 2,232 tons of tar deposits, and 14,771 tons of phenol in water solutions was set in the 2013 restructuring, as additional hazardous chemicals were discovered during implementation. By project closing, a total of 5,109 tons of tar sludge, benzene, methanol and oily compounds, 2,232 tons of tar deposits, and 14,775 tons of phenol in water solutions were removed from the former gasification site and properly treated and/or disposed of, thereby exceeding the original target by 26 percent and the revised target by 2 percent. See Table 1.

Table 1: Overview of hazardous chemicals removed and disposed

<table>
<thead>
<tr>
<th>Substance</th>
<th>Original target (tn)</th>
<th>Revised target (tn)</th>
<th>Achieved (tn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tar sludge, benzene, methanol, and oily compounds, safely removed and disposed</td>
<td>4,300</td>
<td>4,780</td>
<td>5,109</td>
</tr>
<tr>
<td>Tar deposits, removed and disposed</td>
<td>-</td>
<td>2,232</td>
<td>2,232</td>
</tr>
<tr>
<td>Phenol in water solutions, removed an treated on-site</td>
<td>Partial removal of 13,245 tons</td>
<td>14,771</td>
<td>14,775</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Max. 17,545</strong></td>
<td><strong>21,783</strong></td>
<td><strong>22,116</strong></td>
</tr>
</tbody>
</table>

136. The achievement is significant. In part, because the continued degradation of the stored chemicals at the former gasification site presented one of the biggest environmental risks in Kosovo and in part, because of the tremendous challenges faced by the PMU and Bank team to ensure the export and safe transportation of the most hazardous chemicals to other countries for incineration. As Kosovo is not a signatory to the Basel Convention, the PMU, contractor, in close cooperation with MESP needed to prepare bilateral agreements with each country involved.
137. **Indicator 10: Project beneficiaries: 21,500 residents in Obiliq municipality**

138. An overall target of 21,500 project beneficiaries was set in the 2013 restructuring to reflect the group of residents in Obiliq municipality most affected by high dust-levels. This number was also used as the basis for the financial and economic analysis of the project at appraisal. The target, which includes a sub-target of which 10,600 females, was reached by December, 2012 when 55 percent of the ash dump had been remediated.

### 3.3 Efficiency

139. **Rating: Substantial**

140. The original PAD included an economic analysis based on the benefits of elimination of health hazards due to dust, elimination of dangers to property due to geotechnical instability, and increased access to land due to reclamation. The analysis has been updated for the project quantifying the actual substantial benefits to Kosovo. The following benefits were quantified for the project (see details in Annex 3):

- The complete halting of dry ash dumping on land and remediation of the Kosovo A ash dump that ensures that there is no more dust arising from the ash dump and ash handling. This generates significant health benefits for the local population, with an estimated value of US$1.9 million per year.
- Due to the stabilization and remediation of the Kosovo A ash dump the hazards due to the extensive geotechnical instabilities were removed and further loss of property in the areas were eliminated. Benefits estimated at US$350,000.
- The reclamation of the overburden dumps will make land available that can be used in the future for natural habitats, agriculture, and resettlement purposes. The values are estimated at US$5.5 million per year for the benefits of land reclaimed for future agriculture and US$2.3 million per year for land reclaimed for resettlement purposes.

141. The result of the economic analysis shows that the Economic Rate of Return (ERR) is 12 percent. Details are provided in Annex 3.

142. The project design was based on a least-cost approach, where international funds from IDA grants and credit were used to develop the design, to purchase / repair the equipment, and to provide staff training for the remediation of the ash dump and reclamation of overburden dumps, but the works were executed and financed by the mining and energy company, KEK.

143. The cost-effectiveness of the project becomes evident when compared with a similar regional project. For the CLRP, ash dump remediation cost approximately US$7 million for 179 hectares of which US$5.5 million was spent from IDA resources and US$1.5 million from KEK’s contribution. In comparison, the Gradac waste dump remediation in the Montenegro Industrial Waste Management and Clean-up Project (P122139), which is also based on works such as reshaping, stabilization, and covering is estimated at US$6.35 million for 12.5 hectares on the basis of contractors executing the works.

### 3.4 Justification of Overall Outcome Rating

144. **Rating: Satisfactory.**

145. Given that the project objectives were formally revised twice, the ICR team undertook a split evaluation of the achievement of project outcomes against original and revised PDOs. Table 2 below shows that early revision of the PDO (from removal to remediation of the ash dump) significantly improved overall project achievements and resulted in “above the line” rating.
Table 2: Split evaluation of PDOs

<table>
<thead>
<tr>
<th></th>
<th>Against original PDOs</th>
<th>Against first revision of PDOs (2009)</th>
<th>Against second revision of PDOs (2013)</th>
<th>Overall</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rating</td>
<td>Unsatisfactory</td>
<td>Satisfactory</td>
<td>Satisfactory</td>
<td>Overall</td>
</tr>
<tr>
<td>2</td>
<td>Rating value</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Weight (% disbursed)</td>
<td>10%</td>
<td>62%</td>
<td>28%</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Weighted value</td>
<td>0.2</td>
<td>3.1</td>
<td>1.4</td>
<td>4.7</td>
</tr>
<tr>
<td>5</td>
<td>Final rating (rounded)</td>
<td></td>
<td></td>
<td>Satisfactory</td>
<td>Early revision results in “above the line” rating</td>
</tr>
</tbody>
</table>

146. Under the circumstances in a challenging country context, including Kosovo’s move towards independence and the difficulties faced by an emerging nation and democracy, it is quite remarkable that the project enjoyed such great support that it was able to attract additional US$9.2 million in IDA funds and over US$20 million from other sources to achieve outcomes far beyond what was initially planned. Perhaps most importantly, the project ignited change of outdated ash-handling and overburden dumping practices and inadequate regulatory frameworks, with a high degree of neglect for the environment and the health of population, by enabling KEK to reclaim land as an integrated part of mining operations and encouraging the systematic and detailed assessment of environmental and social impacts of new power generation and mining activities using proper air, soil, water and groundwater baseline data.

147. In arriving at an overall outcome rating of satisfactory, it is noted that: a) the Project enjoyed a high degree of relevance of objectives and remained relevant and feasible with a technical change to the design; b) the achievement of project development outcomes was satisfactory against revised objectives; c) the outputs and outcomes were wider than and exceeded the objectives defined under the original project; and d) the economic analysis confirms the substantial efficiency of investing in clean-up of environmental legacy issues and improved environmental performance, based on a least-cost design that underpins the inherent sustainability of project development outcomes.

3.5 Overarching Themes, Other Outcomes and Impacts
(a) Poverty Impacts, Gender Aspects, and Social Development

148. The importance of power to the provision of other basic services cannot be underestimated. Power is central to sustainable economic, social, and environmental development as well as to poverty reduction and is paramount to Kosovo’s overall development process. This was recognized in the Bank’s Interim Strategy Note applicable at the time of project approval, and remains true today. Without better environmental and social performance of the power generation sector and its associated mining, it will be challenging if not impossible to continue to deliver these basic services of power provision to the citizens of Kosovo.

149. At the community and plant level, the positive health impacts of remediating the ash dump and halting the practice of openly dumping coal ashes are in no uncertain terms large. The largest impacts are felt by KEK employees and nearby resident, who are less exposed to high dust levels on a daily basis and where the remediation of the ash dump allowed for villages in the neighborhood to experience some revitalization.
150. While revitalization of surrounding villages was not a formal objective of the project, anecdotal evidence of project impacts is easy to find. During the ICR mission, a visit to Dardhiste village bordering the Kosovo A ash dump showed how the town is flourishing following remediation of the ash dump and Dragodan overburden area. Housing construction is on the rise, as residents are moving back to the village, and a new mosque was erected. Similarly, in nearby Lizmir located next to part of a reclaimed overburden area, investments in existing infrastructure, such as improvements to the local school, are materializing.

(b) Institutional Change/Strengthening

151. At KEK, the key evidence of institutional strengthening is the establishment of a full-time mining Reclamation Department with more than 50 staff, which now has many years of experience in land reclamation works. Prior to and following project closure, reclamation works have been continued by KEK with full responsibility for equipment, staff, and funding. In addition, KEK has been fully responsible for the operation and maintenance of the wet ash system since its commission in December, 2013 and has operated it without any major issues.

152. At MESP, extensive training in Best Available Techniques and International Standards for mining and electricity production for government officials will have a longer-term impact on the capacity of the Ministry. Environmental baseline data, collected as part of the impact assessment, is now being used for many other purposes.

153. Three continuous and automatic air quality stations, purchased and installed under the project, are also fully integrated in the operations and maintenance by the Kosovo Hydro-Meteorological Institute, under MESP. Information is published annually in the State of the Environment Report: See (http://www.ammk-rks.net/?page=2,7,367).

(c) Other Unintended Outcomes and Impacts (positive or negative)

154. The project helped motivate KEK management to understand the positive returns of investing in technological solutions with high environmental performance. During the lifetime of the project, KEK invested additional €30 million in retrofitting existing stacks at Kosovo A with new filters (electrostatic precipitators), thereby significantly reducing air pollution. In addition, the wet ash system also generated substantial benefits for lesser stoppage of the Kosovo A power plant, as the old dry ash conveyor belt system broke down frequently and each time the ash handling and transport was stopped, the power plant also had to stop production.

155. Relations with local communities have improved. The Reclamation Department, which was established under the project and now a fixed part of KEK operations are in close contact with residents from nearby villages. During the ICR mission, the team had a couple of encounters with local residents, who expressed gratitude for the helpful KEK staff to make available their earth moving equipment, shovels, and trucks in solving local problems on the ground, such as removal of illegally dumped trash, layering a school yard, and flattening a dirt road. The remediation of the ash dump and halting of handling and dumping of dry ash was also a key factor in the revitalization of villages close to the ash dump (such as Dardhiste).

156. On November 30, 2016 Kosovo’s National Assembly approved Law No. 05/L – 044 on the environmentally endangered zone of Obiliq and its surroundings. The purpose of the law is to define the municipality and its surroundings as a zone of particular environmental risk and undertake the measures to reduce the negative impact from the sources of pollution. The law has not yet been signed into effect.
157. The Government has set up a multi-agency commissions to prepare legislative packages to: a) update the Spatial Plan for the New Mining Field (NMF) to reflect the new 450MW plant configuration, recognizing that the Zone of Special Economic Interest area is too large and adjustment of construction freeze is required; b) update the Resettlement Policy Framework for the NMF based on lessons learned to date; and c) amend the Expropriation Law to include a link to the updated RPF so that it becomes part of the legal framework and corrects the current legal gap. While not a direct outcome, the project has helped motivate this development.

158. As indicated, the pilot resettlement training and study tour that was organized under the Project in December 2014 was scaled up by the Bank, in partnership with other stakeholders, into a two week-long international practical course on “Land Acquisition, Resettlement and Social Sustainability” in Groningen, The Netherlands (July 6-17, 2015). The course is delivered by internationally recognized experts, includes 30 experienced practitioners (including 5 from Kosovo) from over 10 countries and also has a study tour to the lignite mine in Germany. This course has been and will continue to be offered every six months.

3.6 Summary of Findings of Beneficiary Survey and/or Stakeholder Workshops

159. N/A

4. Assessment of Risk to Development Outcome

160. Rating: Moderate. In assessing the risks, each part of the PDO is considered.

161. First, many of the development outcomes achieved in addressing environmental legacy issues are not easily reversed, and the practices that created those legacies are unlikely to be repeated. Open dumping of coal ashes has been stopped through cost-effective investments in a hydraulic ash handling system with a fairly short pay-back period. The conveyor belts which used to transport the dry ash have been dismantled, and the wet ash handling system is an integrated part of the power plant. The remediation of the ash dump, the reclamations of the overburden areas, and the removal of hazardous chemicals from the former gasification site are all fixed achievements. At this point, it is unlikely that the mining and energy sector would reverse to using outdated practices with high environmental costs, as these are impediments to attracting international funding for future investments and not in line with Kosovo legislation.

162. Second, enabling KEK to free land for community development purposes and to remediate the ash dump was achieved through establishing and mainstreaming the Reclamation Department into daily operations. Thus, at project closing, KEK possesses the technical expertise, the equipment, and the operational and financial frameworks to finalize the remediation of the remaining hectares of the ash dump and continue with land reclamations of overburden areas and mine restoration as an integrated part of KEKs business practice. The main risk going forward relates to the upkeep and maintenance of expensive machinery and equipment needed. Too often, replacement of spare parts can leave work undone for extended periods of time. However, the reputational gains from proper environmental and social management as well as the EU Directive which have been transposed into Kosovo legislation and which require the power and mining sector to start working in accordance with Best Available Techniques are likely to pull KEK further in the direction of complying with international standards.

163. Third, the risks at an institutional level for continued clean-up operations and environmentally good practices in the mining and energy sector are mainly tied to external relations and events, such as Kosovo’s accession to EU and foreign and multilateral investments in a new power plant and its associated mine. As Kosovo relies heavily on donor funds and
foreign direct investments and is on an EU accession path, the risk to changing institutional priorities is low. However, at the local level, there seems to be a greater risk of a national and institutional brain drain, as competent staff seeks new opportunities abroad or in the private sector, where salaries are more competitive.

164. Overall, the CLRP has ignited a change of outdated ash handling and overburden dumping practices and inadequate regulatory frameworks in the mining and energy sector with substantial tangible and irreversible outcomes. Hence, the overall assessment of risk to development outcomes is moderate.

5. Assessment of Bank and Borrower Performance

5.1 Bank Performance
(a) Bank Performance in Ensuring Quality at Entry
165. Rating: Moderately Satisfactory

166. At the project preparation stage, the Bank team employed due diligence in basing the project on a solid diagnostic foundation of development priorities, taking into account the lessons learned from other clean-up projects in the mining and energy sector. The strategic relevance of the project, and the overall project concept to initiate and enable KEK to improve environmental performance as part of regular mining and electricity production was sound and remained relevant throughout its lifetime. The project enjoyed early high-level commitment and local ownership. Provisions for procurement, financial management, and safeguards were all adequate at the preparation stage.

167. The project was delivered to Board in less than 10 months, which is substantially shorter compared to other pollution management projects in ECA, such as in Kazakhstan\(^8\) (2 years and 8 months) and Montenegro\(^9\) (3 years and 6 months). The project concept included legal covenants to prepare and have the WB approve detailed environmental impact assessments after the finalization of the site investigations and detailed design of the remediation works prior to the start of civil works.

168. One moderate short-coming by the Bank team in ensuring quality at entry relate to the definition of the PDO in relation to the design of component B, which rested on the findings of the detailed site investigation. If the PDO has been worded a bit more broadly instead of specifying to “remove” the ash dump, the change in technical solution to “remediate” the ash dump would not have required a Board Level restructuring. Pollution management projects always constitute risks, and flexibility is needed to allow for adaption of the preferred technical solution once more details from the site investigations of the pollution situation become available.

(b) Quality of Supervision
169. Rating: Moderately Satisfactory

170. The World Bank task team conducted 29 implementation support missions in 10 years, or 2.9 missions per year: a rate above the planned two implementation support missions per year. Given the structurally complex implementation period with two additional financing projects enveloped into the CLRP, and two restructurings with substantial widening of the

\(^8\) Nura River Clean-up Project, Ust Kamenogorsk Environmental Remediation Project.
\(^9\) Industrial Waste Management and Clean-up Project.
original design and scale-up of original targets, the high number of missions is evident of a highly engaged Bank team.

171. What is notable is the level of dedication by the Bank team, demonstrated by being responsive and proactive. There was substantial technical support to assist KEK in complex procurement and technical implementation. Exemplary examples of this are: (i) The first-ever export of hazardous waste from Kosovo to other EU countries through establishment of bilateral agreements with all transit and waste import countries as Kosovo is not a signatory to the Basel Convention; (ii) The remediation of the ash and overburden dumps by the implementing agency itself without prior experience in such work; (iii) The substantial supervision support to the supply and installation contract for the wet ash system, which is a BAT option in ash management and which has been operating since hand-over without problems; and (iv) The support to two PMUs, staffed with technical, financial, and procurement personnel. Extensive training and hands-on learning was made available to ensure compliance with Bank policies and standards.

172. The adaptive and proactive restructuring of the project design related to Component A and B with regards to installing a hydraulic ash transport system and in-situ remediation of the ash dump served the project well. In contrast, the late addition of Component F and the challenging implementation that followed became a liability for the entire project, which in effect had fulfilled all original targets by the time of the 2013 second Additional Financing and restructuring. While it is commendable that the project was so successful in attracting additional co-financing for expanded and new activities, it is worth considering if these activities would not have benefitted from being executed under separate projects. Component F significantly delayed project implementation and increased costs of supervision incrementally in the final years of implementation (see Annex 4).

173. The Bank team showed timely and dedicated attention to the Inspection Panel investigation, which began in 2015. Management remained engaged in raising critical resettlement issues to a high-level of attention. Post project closing, the Bank has continued to work on completing outstanding issue related to the resettlement of Shala neighborhood of Hade village.

(c) Justification of Rating for Overall Bank Performance

174. Rating: Moderately Satisfactory

175. The Bank project team demonstrated a high level of commitment and supported the PMUs in a timely and appropriate manner. The additional requests for financing from the Borrower to scale-up activities and the on-going discussions between the Bank and the GOK about future investments in Kosovo’s power sector is a testament to the trust and leverage that the Bank has brought to bear over the years.

176. The project was prepared in a timely fashion and in accordance with good international practices for clean-up and land reclamation projects, and project implementation adapted to the changing of local conditions and uncertainties.

177. The decision to add an entire new set of activities at the heels of an otherwise successful implementation period was questionable. By rolling in a second PMU and a new set of activities with high reputational risks late in the implementation phase, there were less than optimal conditions for a successful implementation of the CLRP-SAF.
5.2 Borrower Performance
(a) Government Performance
178. Rating: Moderately Satisfactory

179. The Government of Kosovo fulfilled its obligations adequately. There was some difficulty with ratification immediately following Board approval, which resulted in a seven months’ delay before effectiveness. However, following effectiveness, transactions proceeded smoothly, although with some interruptions in regular transactions due to the overall political environment in the country.

(b) Implementing Agency or Agencies Performance
180. Rating: Moderately Satisfactory

181. The PMU at KEK performed satisfactorily. The high level of ownership, the growing technical capacity of staff members, the dedication and professionalism of the team are all key factors in explaining the successful achievement of project targets. Particularly commendable is KEK’s significant co-financing for the wet ash system (€7 million), which was not part of the original design, but which became essential to achieving intended project outcomes. Equally important to project outcomes was the newly established Reclamation Department, which started to focus for the first time in KEK’s history on remediation of environmental legacies and which exceeded the project targets and is continuing to date with all remediation and reclamation works fully funded by KEK. KEK has fully mainstreamed the department of 50 staff into their daily operations and annual budget.

182. The main implementation challenge for the PMU at KEK occurred early in the project and related to the delay in approving contract payments for the supply of earth moving equipment, which affected the implementation schedule of component B and C. KEK also failed to make timely payments for temporary rent allowances in the resettlement of Shala neighborhood of Hade village. This caused the project to be in bad standing with the legal covenants.

183. The PMU at MESP performed moderately satisfactorily. A competent team of staff members were assembled, though hitting the ground running in the midst of project implementation required significant support from the Bank team. The main challenges faced by the PMU at MESP related to the quality of the ESIA, which based on expert reviews required significant revision, and completing the resettlement of Shala neighborhood of Hade village. However, MESP was dedicated to and did fix the broken sewage section at the resettlement even after project closure. MESP has grown its capacity for handling future resettlements and strengthened their overall mandate for managing environmental and social impacts in the mining and energy sector.

(c) Justification of Rating for Overall Borrower Performance
184. Rating: Moderately Satisfactory

185. The overall rating for Borrower performance is moderately satisfactory. Despite a challenging implementation environment with a number of external factors affecting the project, the Borrower and implementing agencies achieved the stated development objectives and exceeded them. This is attributable to two dedicated and competent PMUs supported by a committed GOK and by a responsive Bank team.
6. Lessons Learned

186. **Client and stakeholder ownership.** One of the key lessons, which were reflected in the project design, was the importance of ownership of local institutions and project implementation by the enterprise’s own staff. This model was based on a previous successful clean-up mining operation in Trepca and applied in a similar manner to involve KEK in the implementation arrangements. Indeed, the implementation arrangements created such ownership for the clean-up operations with the establishment of a full time Reclamation Department of more than 50 staff members and the continuing of clean-up operations following the project closing date. It is also evidenced by the large amount of additional co-financing that KEK made available in environmental investments, first in the wet ash system and later in the filters that were applied for the stacks.

187. **PDO should focus on problem, not the technical solution.** The PDO could have used a more flexible wording for the “removal” of the Kosovo A ash dump to allow for this adaptation and to avoid a Board restructuring once the full project design was finalized. In pollution clean-up projects, adaptation to local conditions and inherent uncertainties regarding the extent of pollution is largely a process of “learning by doing”, and flexibility during project implementation is a key factor to allow for adaptation once more detailed investigations of the pollution situation become available. Pollution remediation is a risky business based on its legacy, and exposed intrinsically to a high level of uncertainty, even with the most advanced knowledge and sophisticated technology. When contamination occurs, the involved physicochemical processes tends to be governed by complex, multi-factorial conditions that can lead to extremely irregular pollution distributions and create a high probability for unforeseen situations that are uncovered only during implementation and even during remediation works. And this all has implications on costs. In allowing adequate time and resources for rigorous site investigations, there is a need for flexible supervision to adapt to these circumstances during implementation and allow the project objectives to be achieved using the most appropriate technical solutions.

188. **Late term addition of project activities are to be avoided.** Another lesson learned relates to the late decision of adding a new component with the responsibility of monitoring a resettlement process unrelated to the project. In 2013 when the second additional financing was approved, most key indicators had already been met. In hindsight, it appears that the technical and investment focused CLRP should not have become overburdened by unrelated resettlement issues with high reputational costs.

189. **Trade-offs in preparing pollution management projects.** Another lesson is related to the trade-offs inherent in preparing pollution management projects, specifically clean-up and reclamation projects. These projects typically require detailed technical investigations prior to project design which are often time and budget intensive. However, the preparation period for typical Bank projects does not afford the time that is required for such detailed investigations to be carried out prior to project approval. At the same time, countries may also not be willing to borrow money for conducting those studies without the assurance of a loan. This creates a situation as exemplified in the Kosovo CLRP project where project redesign is called for shortly after loan approval. This is to be resolved by having a more flexible PDO as mentioned above or a longer preparation time in case countries are willing to borrow to this end or substantial grant financing is available.

190. **Flexible M&E framework.** Project level M&E should be given due attention at the project preparation and implementation stage. Due to the nature of a clean-up operations, project level indicators need to be given due attention for changes and monitoring during implementation.
Since monitoring is complex it should thus be given greater attention and weight during implementation. It is also important to have the client assume these responsibilities to foster a target- and results-driven mindset within the country.

7. Comments on Issues Raised by Borrower/Implementing Agencies/Partners
   (a) Borrower/implementing agencies
   (b) Cofinanciers
   (c) Other partners and stakeholders

N/A
Annex 1. Project Costs and Financing

(a) Project Cost by Component (in USD Million equivalent)

<table>
<thead>
<tr>
<th>Components</th>
<th>Appraisal Estimate (USD millions)</th>
<th>Actual (USD millions)</th>
<th>Percentage of Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component A</td>
<td>2.76</td>
<td>2.76</td>
<td>1.20</td>
</tr>
<tr>
<td>Component B</td>
<td>5.48</td>
<td>6.48</td>
<td>118</td>
</tr>
<tr>
<td>Component C</td>
<td>2.40</td>
<td>0.49</td>
<td>279</td>
</tr>
<tr>
<td>Component D</td>
<td>0.72</td>
<td>1.42</td>
<td>483</td>
</tr>
<tr>
<td>Component E</td>
<td>5.63</td>
<td>1.60</td>
<td>n/a</td>
</tr>
<tr>
<td>Component F</td>
<td>2.30</td>
<td>0.60</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Total Baseline / Project Cost</strong></td>
<td><strong>11.36</strong></td>
<td><strong>35.43</strong></td>
<td><strong>312</strong></td>
</tr>
</tbody>
</table>

(b) Financing

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Type of Cofinancing</th>
<th>Appraisal Estimate (USD millions)</th>
<th>Actual (USD millions)</th>
<th>Percentage of Appraisal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrower</td>
<td></td>
<td>3.15</td>
<td>6.00</td>
<td>1.20</td>
</tr>
<tr>
<td>IDA Grant</td>
<td></td>
<td>5.50</td>
<td>5.50</td>
<td>2.00</td>
</tr>
<tr>
<td>NETHERLANDS: Min. of Foreign Affairs / Min. of Dev. Coop.</td>
<td></td>
<td>4.33</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>NETHERLANDS: Trust Fund</td>
<td></td>
<td>1.20</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>IDA Credit</td>
<td></td>
<td>4.20</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td><strong>Total Financing Available</strong></td>
<td><strong>8.65</strong></td>
<td><strong>35.43</strong></td>
<td><strong>410</strong></td>
<td></td>
</tr>
</tbody>
</table>

1 First additional financing, June 28, 2007.
2 Second additional financing, March 28, 2013.
3 Approximate estimate of KEK’s co-financing for the wet ash disposal system of 9.2 million in USD on June 3, 2009, the date of the first project restructuring.
4 Grant of €3 million from the GON covered the initial financing gap of US$2.71 million, and the balance was earmarked to Component D and E (US$1.12 million) at the time of the first additional financing.
5 Additional self-standing grant of €0.9 million from the GON financed further environmental monitoring and management at MESP, supporting the overall project objectives through equipment repairs and removal of hazardous chemicals from the gasification site.
Annex 2. Outputs by Component

191. The following section provides (i) an overview of revised components, (ii) an overview of outputs by components, (iii) a timeline of important events, (iv) an overview of the original and revised results framework, (v) before and after photos of key project achievements; and (vi) an overview of key training sessions.

Table 3: Overview of revised components

<table>
<thead>
<tr>
<th>Final components</th>
<th>Revised / Added</th>
<th>Scope</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Component A:</strong> Preparation of the Mirash Open Pit</td>
<td>June 3, 2009. Revision of planned activity did not require Board approval.</td>
<td>Changed from dry ash to wet ash disposal system.</td>
<td>Reduce dust formation and emissions.</td>
</tr>
<tr>
<td>Mine for Ash Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component B:</strong> Remediation of Kosovo A Ash Dump</td>
<td>June 3, 2009. First Board approved project-level restructuring.</td>
<td>Changed from removal to in-situ remediation of Kosovo A ash dump.</td>
<td>Detailed site investigations revealed a number of technical, environmental, and financial reasons.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component C:</strong> Reclamation of Overburden Area</td>
<td>March 28, 2013. Board approved additional financing to scale-up of activities.</td>
<td>Additional tree planting in overburden areas.</td>
<td>Scale-up.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component D:</strong> Project Management</td>
<td>March 28, 2013. Second Board approved additional financing.</td>
<td>Project support to both KEK and MESP as implementing agencies</td>
<td>MESP would be the IA of new Component F</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component E:</strong> Removal of Hazardous Chemicals from</td>
<td>June 28, 2007. Included in the first Board approved additional financing.</td>
<td>When added, funds covered the removal of highest priority hazardous chemicals from the former gasification site.</td>
<td>New component, which would eliminate one of the most urgent environmental risks in Kosovo. Part of the original project design, the component was not included due to insufficient funds at the time.</td>
</tr>
<tr>
<td>Kosovo A's Gasification Site</td>
<td>March 28, 2013. Scaled up in the second Board approved additional financing.</td>
<td>Scale-up of activities ensured full removal of all priority hazardous chemicals.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Component F:</strong> Environmental Monitoring and</td>
<td>March 28, 2013. Added in the second Board approved project-level restructuring and additional financing.</td>
<td>Implement ESIA for KPP and monitor the implementation of RAP of Shala neighborhood of Hade village.</td>
<td>New component, to support MESP in building capacity for continued environmental management and monitoring.</td>
</tr>
</tbody>
</table>
### Table 4: Outputs by component

<table>
<thead>
<tr>
<th>Component</th>
<th>Output</th>
</tr>
</thead>
</table>
| **Component A:** Preparation of the Mirash Open Pit Mine for Ash Management | - Prepared site investigations and detailed design  
- Reshaped dedicated part of the mine  
- Installation of a simple base liner  
- Drainage and mine water management system  
- Installation of hydraulic ash handling system  
- Installation of pipeline leading from Kosovo A power plant to Mirash mine for disposal of wet ash |
| **Component B:** Remediation of Kosovo A Ash Dump | - Delivery of earth moving equipment  
- Removal of unstable parts of the ash dump  
- Contaminated parts of the ash dump covered on site  
- Reshaped and covered ash dump to allow re-vegetation |
| **Component C:** Reclamation of Overburden Dump Areas | - Prepared site investigations  
- Undertook civil works  
- Planted 138,000 tree seedlings, survival rate much lower at 60%-80% |
| **Component D:** Project Management | - Daily project implementation support  
- Training on procurement and financial management  
- Monitoring and evaluation of project outputs and impacts |
| **Component E:** Removal of Hazardous Chemicals from Kosovo A’s Gasification Site | - Prepared feasibility study, EIA and EMP  
- Repackaging of chemicals for export  
- On-site treatment of phenol solutions in water  
- Preparation of export permits  
- Preparation of bilateral export agreements with destination countries  
- Export of hazardous chemicals |
| **Component F:** Environmental Monitoring and Management | - Installation of three air monitoring stations  
- Implementation of soil and water monitoring program  
- Preparation of ESIA for proposed KPP  
- Implementation of Expert Panel for review functioning  
- Monitored the implementation of the RAP for Shala neighborhood of Hade village  
- Preparation of Low carbon growth energy strategy |
Project Timeline

Concept Review: August 31, 2005
Project approval: June 13, 2006
First additional financing: June 28, 2007
First Board-level restructuring: June 3, 2009
Mid-Term Review: February 15, 2010
Second additional financing and Board-level restructuring: March 28, 2013\(^\text{10}\)
Project closing: August 31, 2016
ICR Mission: November 13-18, 2016

\(^{10}\) This date was pulled from the system and could not be changed, but the actual date of Board approval is May 10, 2013. To be consistent, the ICR will make reference to March 28, 2013 throughout the document.
### Original and Revised Results Framework

Table 5: Original results framework from PAD

<table>
<thead>
<tr>
<th>PDO Indicator</th>
<th>Intermediate Indicator</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal of ashes from Kosovo A at the open ash dump will be stopped and redirected to the Mirash mine.</td>
<td>Prepare Mirash mine for sanitary disposal of Kosovo A ashes.</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Transfer of ash stream from Kosovo A to the dump site will be stopped and redirected to the Mirash mine.</td>
<td>0% of ash production to go to open ash dump</td>
</tr>
<tr>
<td>Initiate and enable KEK to remove Kosovo A ash dump and final disposal in the Mirash mine, thereby initiate and enable KEK to eliminate pollution infiltration from the ashes into the groundwater.</td>
<td>Initiate the removal of Kosovo A ash dump and final disposal in the Mirash mine, eliminating dust problems and pollution infiltration from the ashes into the groundwater.</td>
<td>West tip removed for 100% East tip removed for 20%</td>
</tr>
<tr>
<td>Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Initiate and enable KEK to reduce loss of private property in the area by eliminating the extensive geotechnical instabilities from the Kosovo A ash dump and adjacent overburden dumps.</td>
<td>Enable reduction of loss of property in the areas by eliminating the geotechnical instabilities from the Kosovo ash dump. Baseline: 10 houses at risk.</td>
<td>0 houses at risk</td>
</tr>
<tr>
<td>Initiate and enable KEK to achieve land reclamation for natural habitats, agriculture, resettlement or other land use purposes.</td>
<td>Initiate reclamation of 6.5 km$^2$ of land available (650 hectares) for community development including agriculture, resettlement purposes and/or natural habitats.</td>
<td>4.5 km$^2$</td>
</tr>
<tr>
<td>Increase in capacity in institutions and KEK for good environmental practices mining operations.</td>
<td>Increase in capacity in institutions and KEK for good practices for lignite mining operations.</td>
<td>KEK staff fully responsible for clean-up and land reclamation operations</td>
</tr>
</tbody>
</table>
Table 6: Original and revised results framework

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Original (PAD)</th>
<th>Revised</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposal of ashes from Kosovo A at the open ash dump will be stopped and redirected to the Mirash mine.</td>
<td>0% of ash production still dumped on open ash dumps</td>
<td>Percentage of ash disposal that complies with environmental good practice and is redirected from open dumping on the Kosovo A Ash Dump to the Mirash Mine</td>
<td>Revised: March 28, 2013. Reworded to allow for better tracking of results (baseline and target value changed to percentage value).</td>
</tr>
<tr>
<td>Initiate and enable KEK to remove Kosovo A ash dump and final disposal in the Mirash mine, thereby initiate and enable KEK to eliminate pollution infiltration from the ashes into the groundwater.</td>
<td>West tip removed for 100% East tip removed for 20% (of 25 million m³)</td>
<td>Remediation of Kosovo A Ash Dump, eliminating dust problems and pollution infiltration from the ashes into the groundwater.</td>
<td>55%</td>
</tr>
<tr>
<td>Contaminated land managed or (industrial) dump sites closed under the project (core sector indicator).</td>
<td>Contaminated land managed or (industrial) dump sites closed under the project (core sector indicator).</td>
<td>156 ha</td>
<td>Added: March 28, 2013. Core sector PDO indicator linked to Component B introduced to track remediation of the ash dump site in hectares, as a companion to PDO indicator 2. The target was calculated as 55 percent of the ash dump size, but due to using 283 ha as the basis of the ash dump size, the target was overestimated. Given that the size of the ash dump is 243 ha (as noted several places in the same restructuring document) the correct target would have been 134 ha. For consistency, however, this ICR will use the</td>
</tr>
<tr>
<td>PDO Level Indicators</td>
<td>Original (PAD)</td>
<td>Revised</td>
<td>Comments</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>---------</td>
<td>----------</td>
</tr>
<tr>
<td>Indicator</td>
<td>Target*</td>
<td>Indicator</td>
<td>Target</td>
</tr>
<tr>
<td>Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump.</td>
<td>N/A</td>
<td>Reduce dust arising from the transport of ash and initiate and enable KEK to eliminate dust arising from the ash dump.</td>
<td>&lt;300 mg/m²/day</td>
</tr>
<tr>
<td>Initiate and enable KEK to achieve land reclamation for natural habitats, agriculture, resettlement or other land use purposes.</td>
<td>4.5 km²</td>
<td>Land reclaimed for natural habitats, agriculture or other land use purposes in KEK’s overburden areas.</td>
<td>526 ha</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Land reclaimed for natural habitats, agriculture or other land use purposes in KEK’s overburden areas.</td>
<td>55%</td>
</tr>
<tr>
<td>PDO Level Indicators</td>
<td>Original (PAD)</td>
<td>Revised</td>
<td>Comments</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>---------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1. Initiate and enable KEK to reduce loss of private property in the area by</td>
<td>0 houses at</td>
<td></td>
<td>Revised: March 28, 2013. Dropped as a PDO level indicator to avoid duplication with intermediate-level indicator.</td>
</tr>
<tr>
<td>eliminating the extensive geotechnical instabilities from the Kosovo A ash dump and</td>
<td>risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>adjacent overburden dumps.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Increase in capacity in institutions and KEK for good environmental practices</td>
<td>KEK staff fully</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mining operations.</td>
<td>responsible for</td>
<td></td>
<td></td>
</tr>
<tr>
<td>clean-up and land reclamation operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Increase capacities in MESP for environmental good practices in the mining and</td>
<td>Increase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>energy sector.</td>
<td>capacities in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KEK for continued clean-up operations and environmental good practices in the</td>
<td>KEK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mining and energy sector.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. ESIA for KPP prepared and disseminated in line with Bank’s policies and good</td>
<td>ESIA for KPP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>international practices.</td>
<td>prepared and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>disseminated in line with Bank’s policies and good international practices.</td>
<td>disseminated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resettlement of Shala neighborhood of Hade village completed in line with approved</td>
<td>Resettlement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
## PDO Level Indicators

<table>
<thead>
<tr>
<th>Original (PAD)</th>
<th>Revised</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>Target*</td>
<td>Indicator</td>
</tr>
<tr>
<td>RAP.</td>
<td>All found priority hazardous substances from the gasification site safely removed and treated/disposed (tars, benzene, phenols, methanol, oily compounds).</td>
<td>21,783 tons</td>
</tr>
<tr>
<td></td>
<td>Project beneficiaries.</td>
<td>21,500</td>
</tr>
<tr>
<td></td>
<td>of which female (beneficiaries).</td>
<td>10,600</td>
</tr>
</tbody>
</table>

### Intermediate Level

<table>
<thead>
<tr>
<th>Original (PAD)</th>
<th>Revised</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>Target*</td>
<td>Indicator</td>
</tr>
<tr>
<td>Prepare Mirash mine for sanitary disposal of Kosovo A ashes.</td>
<td>100%</td>
<td>Mirash mine prepared for sanitary disposal of Kosovo A ash.</td>
</tr>
<tr>
<td>Transfer of ash stream from Kosovo A to the dump site will be stopped and redirected to the Mirash mine.</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Initiate the removal of Kosovo A ash dump and final disposal in the Mirash mine, eliminating dust problems and pollution infiltration from the ashes into the groundwater.</td>
<td>West tip removed for 100% East tip removed for 20% (of 25 million m³)</td>
<td></td>
</tr>
<tr>
<td>Enable reduction of loss of property in the areas by eliminating the geotechnical instabilities from the Kosovo ash dump. Baseline: 10 houses</td>
<td>0 houses at risk</td>
<td>Reduction of houses at risk from geotechnical instabilities of Kosovo A ash dump.</td>
</tr>
<tr>
<td>PDO Level Indicators</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Original (PAD)</strong></td>
<td><strong>Revised</strong></td>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td>Indicator</td>
<td>Target*</td>
<td>Indicator</td>
</tr>
<tr>
<td>at risk.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiate reclamation of 6.5 km² of land available (650 hectares) for community development including agriculture, resettlement purposes and/or natural habitats.</td>
<td>4.5 km²</td>
<td></td>
</tr>
<tr>
<td>Increase in capacity in institutions and KEK for good practices for lignite mining operations.</td>
<td>KEK staff fully responsible for clean-up and land reclamation operations</td>
<td></td>
</tr>
<tr>
<td><strong>New (1st Restructuring)</strong></td>
<td><strong>Revised (2nd Restructuring)</strong></td>
<td><strong>Comments</strong></td>
</tr>
<tr>
<td>Removal of highest priority hazardous substances from storage tanks at the gasification site (tars, benzene, phenols, methanol, oily compounds).</td>
<td>Removal of 4,300 tons</td>
<td>Tons of found tar sludge, benzene, methanol and oily compounds from the gasification site safely removed and disposed.</td>
</tr>
<tr>
<td>Partial removal and containment of phenols in water solutions.</td>
<td>Part with highest concentration removed, remainder stored and monitored in reliable tanks.</td>
<td>Tons of found phenol in water solutions from the gasification site safely removed and treated.</td>
</tr>
<tr>
<td>Preparation of full site clean-up investment plan and adaptation of health and safety regulations and low-cost remediation program.</td>
<td>Preparation of full site clean-up investment plan and adaptation of health and safety regulations and low-cost remediation program.</td>
<td>Site clean-up and low-cost investment and remediation plan prepared, including health and safety</td>
</tr>
<tr>
<td>PDO Level Indicators</td>
<td>Comments</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>----------</td>
<td></td>
</tr>
<tr>
<td><strong>Original (PAD)</strong></td>
<td><strong>Revised</strong></td>
<td></td>
</tr>
<tr>
<td>Indicator</td>
<td>Target*</td>
<td>Indicator</td>
</tr>
<tr>
<td></td>
<td>program.</td>
<td>regulation.</td>
</tr>
<tr>
<td><strong>New (2\textsuperscript{nd} Restructuring)</strong></td>
<td><strong>Revised (3\textsuperscript{rd} Restructuring)</strong></td>
<td></td>
</tr>
<tr>
<td>Environmental and social baseline data available for ESIA</td>
<td>Environmental and social baseline data available for ESIA.</td>
<td></td>
</tr>
</tbody>
</table>

* PDO-level targets are mirrored at the intermediate level in the original results framework and applied here to both levels.
Photos

192. The following before and after photos give an impression of project achievements.

Figure 4: Wet ash silo during construction

Figure 5: Wet ash disposal in depleted Mirash mine

Figure 6: Storage tanks on gasification site

Figure 7: Tar sludge on open areas

Figure 8: Work in progress

Figure 9: Hazardous waste packaged for export
Training Sessions

193. The following are the most important training activities provided under the CLRP: (i) On May 13-14, 2014 a Workshop on International Good Practices on Resettlement for 25 key staff from MESP, KEK, MED, Ministry of Finance and the Municipality of Obiliq/Obilic. During this Workshop, internationally recognized resettlement experts shared international good practices and provided recommendations to the GoK regarding institutional arrangements, need for medium and long-term resettlement planning, and enhancements to the RPF. (ii) Another, more comprehensive, three-day training workshop for 30 staff members from KEK and MESP was conducted in December 2014 by international experts and this included a study tour to resettlements related to lignite mining in Germany. That experience was scaled up by the Bank, in partnership with other stakeholders, into a two week-long international practical course on “Land Acquisition, Resettlement and Social Sustainability” in Groningen, The Netherlands (July 6-17, 2015). The course is delivered by internationally recognized experts, includes 30 experienced practitioners (including 5 from Kosovo) from over 10 countries and also has a study tour to the lignite mine in Germany. This course has been, and will continue to be, offered every six months.

194. In addition, there was a study tour to Poland to strengthen the capacity within the Ministry of Environment and Spatial Planning, the Kosovo Environmental Protection Agency and its inspectorates and the Ministry of Economic Development in the field of lignite-fired power plants, including open cast mining, in the following areas: (i) Environmental Impact Assessment for new power plants and how the review and quality control is organized; (ii) permitting tasks as they are defined in Integrated Pollution Prevention and Control legislation (IPPC) and key elements of IPPC permit including application and approval procedures; (iii) frequency and type of inspections to monitor compliance with the permit conditions, (iv) emission registry including emission monitoring obligations for industries and submission requirements to authorities, (v) Best Available Techniques for lignite fired power plants; and (vi) site visit to 3 recently constructed or renovated lignite fired power plants to view their environmental compliance, emission monitoring regime and environmental investments.
Annex 3. Economic and Financial Analysis

1. The original PAD included an economic analysis based on the benefits of elimination of health hazards due to dust, elimination of dangers to property due to geotechnical instability, increased access to land due to reclamation.

2. Elimination of dust from dust handling and ash dumping. The largest contribution to health damage is caused by Particulate Matter. The dust monitoring executed as part of the Project demonstrated that the dust levels from the ash dump and ash handling are now negligible as they are below the detectable threshold of the monitoring equipment. Also the wet ash system eliminated any dust from the ash handling. This benefits the 21,500 people living in Obiliq municipality. The original estimates for the quantitative effect of air pollution on mortality, cases of chronic bronchitis etc. were updated on the basis of the well-known international studies examining the dose-response relationships between exposure to fine particles and health impacts. These dose-response functions present a change in the crude mortality rates and Disability Adjusted Life Years (DALYs) attributable to a change in 10 ug/m³ of annual mean concentrations of PM$_{10}$. The estimated number of DALYs for Obiliq municipality caused by the ash dump and ash practices amount to 215 cases per year. This represents a benefit of US$1.9 million per year.

3. The Kosovo A ash dump presented a hazard due to the geotechnical instabilities and its pressure on the land and endangered nearby settlements in the past. The benefits of prevention of loss of properties have been estimated at US$350,000.

4. The reclamation of the overburden dumps made land available for community purposes. Total benefits of land which was unproductive before is estimated at US$4.55 million per year for the benefits of land reclaimed for future agriculture and US$2.3 million per year for the land reclaimed for future resettlement purposes. Land reclaimed for natural habitats have not been valued though represent a substantial benefit.

5. The results of the economic analysis show that the Economic Rate of Return (ERR) is 12 percent, as shown in the two tables below.
## DALYs - URBAN AIR POLLUTION

### Key parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Obiliq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>21,500</td>
</tr>
<tr>
<td>Adult population &gt;14 yrs</td>
<td>17,200</td>
</tr>
<tr>
<td>Children population &lt;14 yrs</td>
<td>4,300</td>
</tr>
<tr>
<td>Crude death rate (per 1000)</td>
<td>10</td>
</tr>
<tr>
<td>Annual average PM10 (ug/m³) attributable to ash dump</td>
<td>65</td>
</tr>
<tr>
<td>Exposed total population</td>
<td>19,350</td>
</tr>
<tr>
<td>Exposed adult population</td>
<td>15,480</td>
</tr>
<tr>
<td>Exposed children population</td>
<td>3,870</td>
</tr>
<tr>
<td>Annual average SO2 (ug/m³) attributable to power sector</td>
<td>-</td>
</tr>
</tbody>
</table>

### Health categories PM10

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>Impacts per 1 ug/m³</th>
<th>Cases Obiliq municipality</th>
<th>DALYs per 10,000 cases</th>
<th>DALYs Obiliq municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Premature mortality</td>
<td>% change in crude mortality rate</td>
<td>0.084</td>
<td>11</td>
<td>100,000</td>
<td>106</td>
</tr>
<tr>
<td>Chronic bronchitis</td>
<td>per 100,000 adults</td>
<td>3.06</td>
<td>31</td>
<td>12,037</td>
<td>37</td>
</tr>
<tr>
<td>Hospital admissions</td>
<td>per 100,000 population</td>
<td>1.2</td>
<td>15</td>
<td>264</td>
<td>0</td>
</tr>
<tr>
<td>Emergency room visits</td>
<td>per 100,000 population</td>
<td>23.54</td>
<td>296</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Restricted activity days</td>
<td>per 100,000 adults</td>
<td>5750</td>
<td>57,857</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Lower respiratory illness in children</td>
<td>per 100,000 children</td>
<td>169</td>
<td>425</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Respiratory symptoms</td>
<td>per 100,000 adults</td>
<td>18300</td>
<td>184,135</td>
<td>3</td>
<td>55</td>
</tr>
</tbody>
</table>

### Health categories SO2

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>Impacts per 1 ug/m³</th>
<th>Cases Obiliq municipality</th>
<th>DALYs per 10,000 cases</th>
<th>DALYs Obiliq municipality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough days</td>
<td>per 100,000 children</td>
<td>1.81</td>
<td>-</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Chest discomfort days</td>
<td>per 100,000 adults</td>
<td>1,000</td>
<td>-</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

### TOTAL DALYS LOST PER YR

<p>| | |</p>
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<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>216</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Overal disbursements per year WB financing</td>
<td>(1,470,000)</td>
</tr>
<tr>
<td>Operational costs KEK:</td>
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<tr>
<td>Additional contribution KEK wet ash</td>
<td>(3,000,000)</td>
</tr>
<tr>
<td>Maintenance and operating costs</td>
<td>(200,000)</td>
</tr>
<tr>
<td>Staff costs</td>
<td>(200,000)</td>
</tr>
<tr>
<td>Total costs</td>
<td>(1,870,000)</td>
</tr>
</tbody>
</table>

| Benefits                                                            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Removal of ash dumps                                               |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| DALYs prevented from air pollution                                 | 1,943,323 | 1,943,323 | 1,943,323 | 1,943,323 | 1,943,323 | 1,943,323 | 1,943,323 | 1,943,323 |
| Reshaping and recultivation of land of overburden dumps            |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Available land for natural habitats                                | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 | 2,300,000 |
| Available land for resettlement (Barth field)                      | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 | 1,000,000 |
| Available land for agriculture other                               | 4,500,000 | 4,500,000 | 4,500,000 | 4,500,000 | 4,500,000 | 4,500,000 | 4,500,000 | 4,500,000 |
| Total benefits                                                     | 9,743,323 | 9,743,323 | 9,743,323 | 9,743,323 | 9,743,323 | 9,743,323 | 9,743,323 | 9,743,323 |
| CASH FLOW                                                          | (1,870,000) | (2,570,000) | (2,180,000) | (8,950,000) | (5,256,677) | (406,677)  | (256,677)  | (213,323)  |
| IRR                                                                | 12%     |        |        |        |        |        |        |        |

All costs in USD
6. The project design also was based on a very cost effective approach (least cost), where the international funds from the IDA grants and credit were used to develop the international design and purchase equipment and training for the ash dump remediation and reclamation of overburden dumps, but the works itself were executed and financed by the mining and energy company KEK based on existing staff and with their own funds. For the Ash dump remediation, approximately US$5.5 million was spent from IDA resources and US$1.5 million from KEK’s contribution for reshaping and covering of the Ash dump totaling US$7.0 million for 243 hectares. In comparison, the Gradac waste dump remediation in the Montenegro Industrial Waste Management and Clean-up Project (P122139) - which is also based on simple works such as reshaping, stabilization and covering is estimated at US$6.35 million for 12.5 hectares on the basis of contractors executing the works.

7. A number of other key benefits are also a result of the project, but are difficult to quantify:
   - Reduced health and environmental risks due to the treatment and removal of hazardous chemicals, which were stored at the gasification site in corroding tanks; The gasification site clean-up also presents a cost effective approach since the clean-up costs of major chemical spill in the Sitnica river would be a multitude of the costs spend on local treatment and export and destruction of chemicals abroad\textsuperscript{11}. These observed and potential risks were: (i) toxic emissions into the atmosphere (evaporation of volatile chemicals); (ii) toxic emissions into the groundwater (seepage through soil); (iii) contamination of surface water runoff by toxic substances; (iv) threat to health and safety by accidental skin contact, inhalation, digestion; (v) risk of large scale spills due to technical deficiencies of storage facilities, with strong risk of contamination of the Sitnica river; (vi) risk of fire and explosions.
   - Regular air quality monitoring in the municipality close to the power plants and the mines and public disclosure of the data.
   - The structural operations of the project in the electricity company KEK for clean-up and sustainable mining operations and the capacity building of environmental officials in central (particularly MESP) and the local government will contribute to a better approach to deal with environmental legacy issues from lignite mining and power generation and improve monitoring and environmental performance of current mining and electricity production operations as the institutions were exposed to best practices in terms of mining rehabilitation and energy production. This is particularly evidenced by the full-time mining reclamation department which was established in KEK with more than 50 staff and now with many years of experience in mining and land reclamation works, and extensive training.

\textsuperscript{11} In case of a spill of the materials that used to be stored in the corroding tanks, the amount of contaminated materials that would require treatment would a multitude of the relatively small amount of 22,000 tons of chemicals that were now treated and destructed.
• Capacity of environmental officials in central (particularly MESG) and the local
government through extensive training in what constitutes Best Available
Techniques and International Standards for mining and electricity production.
• Environmental baseline information that became available for impact assessment.
• The remediation of the ash dump and halting of the air pollution was a key factor
in the current observed revitalization of the villages closest to the ash dump.
### Annex 4. Bank Lending and Implementation Support/Supervision Processes

#### (a) Task Team members

<table>
<thead>
<tr>
<th>Lending</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Pramod Agrawal</td>
<td>Consultant</td>
<td>SASDA</td>
<td></td>
</tr>
<tr>
<td>George Anjaradize</td>
<td>Junior Professional Associate</td>
<td>ECSSD</td>
<td></td>
</tr>
<tr>
<td>Elmas Arisoy</td>
<td>Practice Manager</td>
<td>GGO08</td>
<td></td>
</tr>
<tr>
<td>Bernard Baratz</td>
<td>Consultant</td>
<td>GEEDR</td>
<td></td>
</tr>
<tr>
<td>Irene Bomani</td>
<td>Operations Analyst</td>
<td>GFA07</td>
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</tr>
<tr>
<td>Olav Rex Christensen</td>
<td>Senior Public Finance Specialist</td>
<td>GEDDR</td>
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<tr>
<td>Drite Dade</td>
<td>Sr Natural Resources Mgmt. Spec</td>
<td>GEN03</td>
<td></td>
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<tr>
<td>Daniel P. Gerber</td>
<td>Sr Agricultural Specialist</td>
<td>GFA03</td>
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<tr>
<td>Ronald N. Hoffer</td>
<td>Consultant</td>
<td>GENDR</td>
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<tr>
<td>Paula F. Lytle</td>
<td>Senior Social Development Spec</td>
<td>GSU07</td>
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<tr>
<td>Norval Stanley Peabody</td>
<td>Consultant</td>
<td>GEEDR</td>
<td></td>
</tr>
<tr>
<td>Frank Van Woerden</td>
<td>Lead Environmental Engineer</td>
<td>GEN2A</td>
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<tr>
<td>Ardian Ymeri</td>
<td>Temporary</td>
<td>ECSHD</td>
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#### Supervision/ICR

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<table>
<thead>
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<td>Floroiu, Ruxandra Maria</td>
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<td>Elona Gjika</td>
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<td>Mitchell, Andrew Michael</td>
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<tr>
<td>Moises Matsinhe, Luisa</td>
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<td>Noel, Maria Lourdes</td>
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<td>Ru, Jiang</td>
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<tr>
<td>Shayne, Adam</td>
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<td>LEGAM</td>
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<td>Van den Berg, Katelijn</td>
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<td>Vrenezi, Edon</td>
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(b) Staff Time and Cost

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<th>USD Thousands (including travel and consultant costs)</th>
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Annex 5. Beneficiary Survey Results
(if any)

Not applicable.
Annex 6. Stakeholder Workshop Report and Results
(if any)

Not applicable.
Annex 7. Summary of Borrower's ICR and/or Comments on Draft ICR

To:  Mr. Marco Mantovanelli  
     Country Manager  
     World Bank Kosovo  

From:  Atanas Gjokaj  
        Managing Director  
        Kosovo Energy Corporation J.S.C.  
        St. Mother Teresa, No. 36,  
        Pristina 10000,  
        Republic of Kosovo  
        www.kek-energy.com

21 January 2017

Subject:  Draft Implementation Completion Report Kosovo Clean-up and Land Reclamation Project

Dear Mr. Mantovanelli

Thank you for sharing and offering the opportunity to comment the Draft Implementation Completion Report Kosovo Clean-up and Land Reclamation Project No: ICR100004037 of February 13, 2017.

Kosovo Energy Corporation Management having considered the draft Implementation and Completion Results (ICR) for Clean-up and Land Reclamation Project, sends the following comments:

The objectives of the Clean-up and Land Reclamation Project were to: (a) address environmental legacy issues related to open dumping of ashes on land; (b) enable KEK to free land for community development purposes currently taken by overburden materials and enable KEK to remove Kosovo A ash dump; and (c) build capacity in KEK for continued clean-up and environmentally good practice mining operations.

The original project was approved in 2008 and underwent some changes to its design, scope and scale throughout its implementation. The project development objectives and associated key indicators were revised and the scope of the project was broadened to include capacity building activities and to address the emerging needs on the ground.

Kosovo Energy Corporation J.S.C is a company incorporated under the laws of Republic of Kosovo
Registered number: 70325306
Registered office: No. 36 Mother Teresa Street, Pristina, 10000, Republic of Kosovo
KEK has benefitted from the project from different points of view: health and environmental, operational and structural. The remediation of ash dump has decreased the air pollution and enabled the revitalization of the villages nearby; the redirection of Kosovo A ash to Mirash Pit improved the environmental performance of current mining operations; the treatment and removal of hazardous chemicals reduced the risk for environmental disaster by the possibility of destruction of corroding tanks filled with hazardous chemicals. The structural operations for clean-up and sustainable mining operations contributed to a better approach to deal with environmental legacy issues from lignite mining and power generation.

We consider that the project achieved stated development objectives and exceeded the targets of most indicators. Therefore, the Kosovo Energy Management considers that the draft ICR report for Cleanup and Land Reclamation Project in general is acceptable.

Best Regards,

[Signature]

[Stamp]

[Name]
Manager Director

Co-authors: Kateryn von der Beie, World Bank
Edmond Nalteka - KEK
Milenko Dacic - KEK

Kosovo Energy Corporation JSC is a company incorporated under the laws of Republic of Kosovo. Registered number: 70533260
Registered office: No. 36 Mother Theresa Street, Pristina, 10000, Republic of Kosovo.
IMPLEMENTATION COMPLETION REPORT
“CLEAN UP AND LAND RECLAMATION PROJECT“

Funding provided by the Government of the Netherlands and by the World Bank

Prepared by: Project Management Units, KEK and Ministry of Environment and Spatial Planning
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      1.1.2 Ash Disposal from TPPA..............................................................................
      1.1.3 KEKs Gasification Plant site Obiliq.................................................................
   1.2 Project Financial Background..............................................................................
   1.3 Projects main objective....................................................................................... 

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Annex: Pictures of Works
List of abbreviations

TPP Thermal Power Plant
KEK Korporata Energjetike e Kosoves (Kosovo Energy Corporation)
IDA International Development Organization
MESP Ministry of Environment and Spatial Planning
MEM Ministry of Energy and Mines
UNMIK United Nations Mission in Kosovo
PMU Project Management Unit
PIU Project Implementation Unit
KPC Kosovo Protection Corps
CLRP Cleaning and Land Reclamation Project
MW Mega Watt
Btu British thermal unit
LLOC Liquids with Low Organic Content
LHOC Liquids with High Organic Content
PAH Polyaromatic hidrocarbons
TOC Total Organic Carbon
KTA Kosovo Trust Agency
ICMM Independent Commission of Mines and Minerals
mlcm Million cubic meters
ha Hectares
m Meters
1. PROJECT DESCRIPTION

1.1 Background

Kosovo has rich and high quality lignite reserves. The mines supply two thermal power plants (TPP A and TPP B), constructed between 1964 and 1985 in the direct vicinity of the mines. Power plants are complex systems converting natural sources to thermal and electrical energy. Power Plant Kosovo A has five operating units called: A1, A2, A3, A4 and A5, located near Obiliq City, 8 km from Prishtina. A1 unit started its operation on 1962, A2 on 1965, A3 on 1970, A4 on 1971 and A5 on 1975. Together Kosovo A units have the capacity to produce 800 (MW). Currently only A3, A4, and A5 are functioning. Power plant Kosovo B has two operating units: B1 that started operating on 1983 and B2 on 1984. Together they produce 678 (MW).

Lignite as a main fuel of Power plants was initially taken from surface mines in Mirash and Bardhi. These two mines were explored till the year 2012. Currently the lignite is taken from Sibovci southwest mine and Sitnica surface mine.

On surface mining, the layer of soil that covers lignite, in depth from 5 – 100 m, is excavated and usually dump near mines, in order to use it on later activities for reclamation of explored mines. This material is called overburden. The biggest dump directly borders Mirash south mine. Additional outside dumps are located in the hills west of the Bardhi mine, in the plains east of the Mirash mine and north of both of the mines. The outside dumps are completely in ownership of the mining company KEK and have not been reclaimed before. A shaping of the surface was implemented in some cases only as the site investigations and design study investigated which measures were required in order to be able to make the land available for future use. The locations of the Bardhi and Mirash mines, the Thermal Power Plant (TPP) Kosovo A, the Kosovo A Ash Dump and the outside overburden dumps are shown in the following map.
In some parts of the outside dumps, slope movement was being observed and concluded that they were not safe for the public. There were also substantial issues with water management at the dump sites. The Cleaning and Land Reclamation Project includes reclamation of Kosova A ash dump, South overburden Dump, Lismir and Kuzmin overburden dump, Vasileva and Kalaja overburden dump.

1.1.1 **Origin and history of the TPP A Ash Dump and South Dump Area**

As a product created by combustion of the lignite during the energy production, is ash production. Besides the overburden, the ash of both of the TPP’s was also dumped on outside dumps for a long time. Whereas, the ash dumping of TPP B was changed to inside dumping in the residual pit of the former Mirash - East mine, from 2006, the ash of TPP A was still dumped on an outside dump located on the D-Field in direct vicinity of TPP A.
In this place, ash and overburden was dumped. The overburden dumping was originally planned for covering the ash with soil for reclamation purposes. This overburden was dumped when one of the oldest mine - Mirashi mine, was opened, in the 1960’s. But this idea could not be put into practice, so the overburden was dumped west and south of the already partly existing south-western wing of the ash dump in two slices, up to the middle of the 90’s. Later, parts of the overburden dump were covered with ash coming from TPP Kosova A, merging with the overall ash dump, which became part of the area treated by Reclamation Project. The total dump consisting of the ash and accompanying overburden dump covers an area of 243 ha. The total volume dumped in this area comes to more than 44 ml cm. The dry ash was dumped by two spreaders and pumped via opened pipes. The Kosovo A Ash dumps also covers a former underground mining area. Parts of the old underground mining galleries extend under the ash dump area and could be observed east and west of the ash dump. Here the underground galleries caused cracks on the surface (see pictures below). The former shaft of the so called Krusevci underground mine was located in the area north-west of the ash dump. The shaft has been filled and covered after closure of mine by KEK.
The southern section of the ash dump was the area still in operation for ash dumping at the start of the Project. The dump was divided into 2 parts, the south-eastern and the south-western wing. The ash head belt conveyor ran between both wings. Both dumps could be operated independent with a separate bench belt conveyor and spreader.
Stability problems from the ash dump occurred, which lead to ash and overburden displacements and cracks in the ash body. Private houses at the Western Boundary of the Kosovo A Ash dump were endangered, caused by the overburden material moving towards the houses which was pushed by the moving ash body (See pictures below).

![Ash dump near private properties](image1)

![Ash dump near private properties](image2)

Slope movement of the ash dump and endangering of private properties by the pushed overburden material.

Whereas the dumped overburden material was more or less naturally re-greening, the pure ash body remained without any vegetation for many decades. This caused a lot of problems with air pollution coming from both the dumping of ash and also from the uncovered dump itself, (see pictures below).

![Air pollution from ash dump](image3)

![Air pollution from ash dump](image4)
Another environmental aspect was the found contamination of the ash and the underground with phenol and other by-products of the former gasification plant. This was done on the period when gasification plant started operating, between the years 1970 – 1980. These chemicals had been discharged in the ash dump and the old underground mining galleries lying below the dump.

![Image of ash dump and underground mining galleries](image1.png)

By-products of the former gasification plant at the ash dump and old underground mining galleries below the ash dump.

In 2008, at the western border of the ash dump (in the corner between the ash dump and its accompanying overburden dump) near the village of Dardishte an old ventilation shaft of the underground mining collapsed and created a crater with diameter of more than 8 m and depth of at least 36.5 m, with a water level app. 15 m depth. Significant layers of strong smelling tar were observed.

<table>
<thead>
<tr>
<th>Summarizing, the main observed and potential environmental problems and hazards identified at Kosovo A Ash Dump were:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Very strong dust generation</td>
</tr>
<tr>
<td>2  Hazards due to extensive geotechnical instabilities</td>
</tr>
<tr>
<td>3  Seepage of precipitation water through ash into groundwater</td>
</tr>
<tr>
<td>4  Soil and surface water contamination by dust and washout of fines</td>
</tr>
<tr>
<td>5  Potential groundwater contaminations by buried toxic waste deposits under the dump (phenols, tars from former gasification plant)</td>
</tr>
<tr>
<td>6  Dump represents highly degraded land unfit for any agricultural or residential purposes</td>
</tr>
</tbody>
</table>

**1.1.2 Origin and history of the ash disposal from Power Station Kosovo A (TPP A)**

In the brown coal power station Kosovo A (TPP A), consisting of Blocks 3-5 with a total output of 400 MW, energy has been produced for 46 years Block 1 and Block 2 are not in use anymore. The transport of the dry ash was done from the silos by open conveyor systems to the Kosovo A ash dump. At the ash dumpsite the bottom ash was distributed eastbound and west bound via two spreaders.
While operating the dump (drainage and transport of the ash), a large environmental impact was caused by air pollution and the pollution of ground water. The stability of the dump couldn’t be guaranteed in case the dump would be extended and the closeness of the village Dardhishhta also made it impossible to extend the dump due to environmental and technical aspects. The existing machinery of the ash transport system including the silos, was also in a bad technical condition. Conventional operation of the entire ash transport machinery was thus hardly possible, safe work from the standpoint of industrial safety was not given, and further operating of the ash transport system under present conditions after considering aspects of environmental protection was not justifiable. For these reasons, a decision was made during the implementation of the CLRP to fully replace the dry ash transport and dumping with a wet-ash handing system.

1.1.3 **History and background of the KEK’s Gasification Plant Site at Obilic (Kastrioti).**

The Gasification Site is an industrial park next to the Kosovo A Thermal Power Plant (TPP A) that covers an estimated area of roughly 40 ha. The Gasification Plant Site is located within the municipality of Obilic, approximately 10 km eastwards from the city of Prishtina. The production/conversion unities of the gasification plant were out of operation more than a decade ago. They consisted of the main gasification plant, a steam and power generation plant, an ammonia plant, an air separation plant and a large storage facility infrastructure. The various units are connected by a number of aerial and buried pipelines.

At its western side, the Gasification Plant is geographically constrained by a railroad and the thermal power plant A (TPP A). North-east a highway is running from Obilic along the industrial area. The south boundary is defined by conveyors that transfer the brown coal from the open pit mine to the preparation plant. In addition there is a road to the high way. The closest human settlements are located at a distance of ca. 500 m north to the industrial area. At the south, the first settlements are also at a distance of ca. 500 m from the gasification plant area. In addition to
the Sitnica River the ecosystem includes some green areas. These areas are mostly used for agricultural purposes.

The plant consumed dried brown coal (lignite) and produced two primary products: a medium-Btu fuel gas and hydrogen for use in ammonia synthesis. Various by-products were also produced: tar, medium oil, naphtha and crude oil.

The main goal of the clean-up project was to remove the hazardous compounds in order to bring significant benefits in terms of eliminating the risks and concern for negative effects on public health and for potentially environmental impacts arising from the actual situation.

<table>
<thead>
<tr>
<th>Summarizing, the main observed and potential environmental problems and hazards identified at Gasification site, were:</th>
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1.2 Project Financial Background

The International Development Organisation (IDA) made available USD 10.5 million and the Government of the Netherlands made available Euro 3.85 million for the above mentioned project components while KEK as an implementing agency has supporting the project with some 3.5 million Euros in terms of operation costs and also has invested more than Euro 8.5 million in the wet ash transport component.

The government of the Netherlands made available additional Euro 229,000 for continuing works in the clean-up of stored waste from former gasification site.

The Additional Financing IDA Credit and KEK as implementing agency was supported by Additional Financing for restructuring and further scale-up of the existing clean-up and land reclamation activities, particularly related to the full removal of hazardous chemicals on the gasification site.

1.3 Project main Objective

The main objective of the Clean-up and Land Reclamation Project (CLR Project) was the improvement of the environmental situation in the surroundings of the KEK mines and power generation capacities by a reduction of dust emissions from the existing TPP A ash dump. The concept of remediation of the ash dump and the reclamation of the overburden outside dumps enabled a fastest possible and sustainable improvement of the environmental situation. Kosovo B Ash dump was not part of the Project, as the geotechnical stability of the Kosovo B ash dump was better and the surface hard and cemented, causing lest dust and air pollution problems but therefore also more difficult to remove/reshape.

The conversion from ash dry dumping, to wet ash removal, would lead to a reduction by around 80%, of the dust emissions caused by the ash dump. This corresponds to the portion, which is caused by transporting and dumping of dry ash. The remaining 20%, caused by the ash body itself are likewise reduced by a partial covering with overburden material which will green.

The contaminants of by-products of the former gasification plant that remain in the ash dump had to be covered and compacted by cohesive material in order to avoid washing out. The similar actions were necessary to re-establish the public safety also in zones with high water saturation in the dumped overburden. Therefore the Project also aimed to initiate the reclamation of 6.5 km² of the area covered by overburden dumps for community development purposes, such as agriculture, resettlement purposes and/or natural habitats.

In order to bring significant benefits in terms of eliminating the risks and concerns for negative effects on public health and for potentially environmental impacts raised another goal of clean-up project: to remove the hazardous compounds from Gasification site.

The Overall CLR Project consisted of the following components:

**Component A - Preparation of the Mirash Open Pit Mine for Ash Management**

(i) Geotechnical, environmental and hydro-geological investigations, analyses, an environmental assessment and environmental management plans, and detailed design for all project components, including Components B and C;
(ii) Reshaping of a dedicated part of the Mirash mine and installation of a simple base liner (overburden clay slash mix), including affiliated preparatory works for the reception of ashes and overburden materials;

(iii) Inclusion of a drainage and mine water management system, and

(iv) Adaptation of Kosovo A Thermal Power Plant direct ash disposal system to stop open ash dumping and redirect ash disposal to the prepared compartment of the Mirash mine. Construction of Wet Ash Transport system

**Component B – Remediation of Kosovo A Ash Dump**

Initiate and enable KEK to perform environmental remediation of the Kosovo A Ash Dump in-situ with containment measures and reallocation of those parts of the dump that have stability risks in order to eliminate dust problems and pollution infiltration from the ashes into the groundwater.

**Component C - Reclamation of overburden dump areas**

Initiate and enable KEK to reclaim the overburden dump areas (Southern, Lugu i thelle & Kalaja and Vasileva overburden dumps). This component focuses on reclamation of about the land through investigation, reshaping and re-cultivating the overburden dumps in the South Field and locations west of the Bardhi mine in order to free land for community purposes.

**Component D - Project management**

Provision of technical assistance to KEK and MESP for the purposes of Project implementation, including the financing of trainings and Incremental Operating Costs such as: Project Management, short term experts, office equipment for MESP and audits.

**Component E - Hazardous Chemicals Clean-up at the Kosovo A Gasification Site**

(i) Removal and disposal of tar deposits and tar sludge from the Kosovo A gasification site.

(ii) Monitoring the implementation of tar deposits and tar sludge removal and disposal from the Kosovo A gasification site.

In particular, the clean-up project aimed to dispose of ca. 20’000 t of hazardous wastes from the following storage facilities: 12 vertical and 16 horizontal tanks, 156 barrels, 2 open basins, 1 open tar deposit.

**Component F – MESP Environmental Monitoring and Management**

Improving the review and monitoring function of MESP in relation to the environmental and social implications of large power plant projects, through the provision of consultancy services and technical assistance in the following areas: (i) review of environmental impact assessments; (ii) permitting tasks; and (iii) inspections to monitor compliance with permit conditions.
2 PROJECT IMPLEMENTATION

2.1 Operation arrangements

The Grant was managed by two PMU’s (MESP and KEK). The responsibilities were split as follows:

KEK
Part A - Preparation of the Mirash Open Pit Mine for Ash Management. Construction of Wet Ash Transport System
Part B –Remediation of Kosovo A Ash Dump
Part C - Reclamtion of overburden dump areas
Part D: Project Management
Part E: Hazardous Chemicals Clean-up at the Kosovo A Gasification Site

MESP
Part F: MESP Environmental Monitoring and Management
Part D: Project Management

2.2 Project Implementation

2.2.1 Part A - Preparation of the depleted Mirash Open Mine for Ash Management

A technical study on the wet disposal concept in the depleted Mirash Open Mine Pit was completed by INKOS (Institute that provides professional consultant services on energy and mines), in September 2007. From an environmental point of view, the wet disposal concept had considerable advantages, especially in comparison with the previous situation at the ash dump. The total disposal area was confined within the depleted mine pit boundaries. The geological investigations confirmed green clay forming the bottom of the disposal facility thus representing a thick natural seal with low permeability. The material that was planned for permanent disposal was ash and waste water pumped as slurry from Kosovo A power Plant.

![](image1)

Works on preparation of Mirash pit

From the environmental point of view, the environmental impacts are minimized and risks are very much reduced for the ash disposal for reasons presented below:
• No additional land is used, no additional soil is impacted by using exploited mine voids. Disposal facility is confined at bottom of the mine, minimizing impact of any spillage, slope failure or dam breach.
• Disposal facility is isolated from the surface water runoff at adjacent areas. In addition, in the bottom of the pit mine the layers of gravel and clay were compressed well, in order to prevent the surface water to flow underground.
• Natural thick clay layer. The Mirash pit is also in lower altitude than Sitnica River and due to ash: water ratio the slurry hardens out quickly.
• No dust development due to wet disposal concept, sprinkling system provided as counter measure in case ash surface dries out.
• No noise during regular operations. Noise by vehicle access confined in open pit, and there is no exposed source for noise.
• Disposal facility supports backfilling of mine and integrates well into mine closure plan. No risks for long term erosion of disposal facility.

The mine was fully prepared and started to receive wet ash on November, 2013.

2.2.2 Construction of Wet Ash Transport System

A group of international experts has been hired to prepare the Terms of Reference for Wet ash transport construction. A bid for design and construction of wet ash transport for Power Plant Kosovo A has been advertised on 2009. On 2010, a Contract was signed after KEK Board of
Directors gave approval on additional finance and contract negotiations with the awarded company. By the first half of the year 2013, the Contractor has finished with the System construction works. The system was tested for transportation of ash to Mirash Mine, on manual mode. On 23rd of August, 2013 the System started to work by transporting the ash from Kosovo A blocks 3 and 5 to Mirash Mine. The contractor trained KEK employees appointed to work with this system for 3 months.

The pictures from the construction process are showed below.

Technical description of the main components of the ash transportation system

**Wet ash silo:** In the wet ash bunker fire room ashes are collected and accumulated, the resulting Amount is 15 t/h. The size of the steel-wet ash silo amounts to 1000m³; for the continuous discharge of ashes, suitable components (vibration ground) are installed.

**Haulage system:** Under the silos suitable haulage system/conveyors are attached. The ash transport from the silos to the following construction unit occurs as dust free and environmentally friendly as is possible in closed housing. A certain adjusted volume of drying ashes (150 t/h) is continuously supplying to the pre-mixing unit of the conditioner (mixing tank).
**Grinder**: The firm, rough parts of the fire room ash are carefully broken in two parallel installed grinders. Here two double-roller crushers are used. The dimensioning and construction occur according to the grain size (grit size) and the extraction from 15t/h.

**Ejector**: Ejectors are used for the hydraulic transport of the ash-water suspension from the wet ash silo to the pre-mixing unit of the mixing tank. These ejectors are very simply developed and do not have any mobile components, and are therefore very sturdy and low-maintenance.

**Dry ash silo**: The dry ash bunker consists of two steel silos, each measuring 1000m³. The amount of accumulating dry ash is 150t/h. The central exhaust is installed in the dry ash bunker.

**Purifier with stirring device (mixing tank)**: In the mixing tank, the dry ash and the wet ash are readied into a transportable thick mud. The mix ratio of the two ash types (dry-wet ash) amounts to 10:1. The mix ratio ash-water can amount from 1:1 to 4:1. The pre-mixing unit receives an industrial water supply. Using suitable pumps this sludge is transported to the waste dump by a pipe system.

**Slurry pumps**: The selection of the pumps is effected first of all, by the medium which is to be carried, sludge, which is a mixture of fluid and solid components. Individual foreign material with a size of 60-80% of the conveying cylinder can be transported without any difficulty. The pumps are installed in a row. The arrangement of the pumps occurs in pump stations. There all necessary armatures to the operation, measuring and regulation mechanisms and lifts for maintenance and repair work are installed. In the pumping station the necessary connection supplies for the function of the pumps is also assembled, such as industrial water, rinse water, electricity, hydraulic aggregates.
Pipe work system: For the hydraulic transport of the ash water suspension a completely new piping system is developed. With the selection of suitable piping numerous factors are considered, including the operating parameters, the kind of demands, fittings, subsequent treatments, with quality acceptance specifications. Particulars indicated result from the composition of the medium, the capacity of the pumps, the route guidance, and the resulting piping transfer, as well as assembly conditions, resulting from it. The course of the trace is specified with the operator according to the local regulations. The piping system consists of two parallel-running, redundant pipes. The piping is accessible at all times over the entire course of the line. At unattainable line sections a service way is established with a width of 2.5 m. The necessary armatures for safe operation, for changeovers, for activations and deactivations, maintenance work are planned. At exposed places emptying and exhaust options are installed. The emptying procedures are controlled, implemented in waste water basins. The emptying basins are built with reinforced concrete.

Raw water (untreated water) maintenance, raw water reservoir: For the plant two water circulations with different compression phases are developed. A cycle with high pressure is needed for the transport of wet ashes from the silo to the purifier with the help of ejectors and also for the injection into the mixing unit. The rinse water lines for the slurry piping are also attached via the high compression phase. The other cycle supplies with low pressure the top of the ejector with the necessary water to pre-mix the dry and wet ashes. Each cycle is redundantly equipped with two centrifugal pumps. The operating pressures are laid out according to the requirements of the aggregates downstream. The pumps are arranged together with the rinse water pump (mixing unit) in a pumping house. Appropriate lifts for maintenance and repair measures are installed in the pumping house. The supply of the necessary water volume for the constant supply of raw water for the water pumps becomes secured by the water chamber. In the raw water basin a pump pit is built, there a drainage-pump evacuates the resulting sand mud. The raw water basin is elevated implemented aboveground in such a way that by the geodetic height the supply pressure pump is developed.

![Water pumping and pipe work system](image)

Measurement and control technique: Local and central control of ash handling system is adapted to medium and low pressure water pumps and there shall be interlock devices between the pumps. Level indicator is considered for settling sump. In the ash handling control room the operation status (running or not running) of the pumps, acoustical indications for failure and the level indications for settling sump are arranged on the control panel. The flow of low and high pressure water pumps is displayed in the control room.

Control room: For ash handling plant one control room is provided. It is located along side of the Slurry pump room. It includes the control room itself and electrical room. It controls the ECO, Air heaters, bottom ash, fly ash from ESP, the conveying to slurry sump, the storage unloading system,
the water and slurry handling system. A status signaling equipment is provided for each sequence by combination of: on off-change, in course-fault, discrepancy. Valves involved in the system operating sequence are incorporate position equipment and shall be actuated by actuators.

**Operating modes:** -In Automatic mode the plant is started, operated and controlled automatically in sequences. All interlocks and safeties are operating. -In Manual mode operator can start and operate the plant by starting each equipment separately following the process logical sequences. All interlocks and safeties are operating. In Local mode equipment can be started locally for test or maintenance purposes.

**Functional systems:** Four systems are distinguished in the ash handling system:
- Bottom ash, ECO and air heater ash conveying
- Fly ash conveying
- Water pumping
- Slurry pumping.

All systems are interlocked all together to assume normal operation of ash handling. All equipment is automatically controlled with necessary interlocks. Emergency shutdown push buttons are located along the conveyors. An automatic jam cleaning sequence is provided for the crusher. Running of all motors is automatically controlled with automatic change-over for Stand-by machines. Level in water reservoir permits to start pumps or stop them for security. Conditioner feeding is made by valves automatically controlled. Levels in slurry conditioner actuates automatic water make up, and permit slurry pumps to start or stop the in security. Slurry pumps start in an automatic sequence. Selection of a line of pump is made by control room before start. Indications of density, flow rate, pressure in pipe and speed of first stage pump are transmitted in control room. Speed of this first stage can be adjusted from the control room. Gland seal pumps are automatically controlled with automatic change-over. A pressure switch actuates an alarm in control room for water pressure. Level probes in header tank permit to start to pumps or actuate an alarm in control room. Drain pumps are automatically controlled in local by level probe and a local panel.

On the 12th on November, 2013 the Wet Ash Hydraulic System was handed over to KEK, fully operational. Wet ash area is estimated to be filled by 2025 after which it can be covered and re vegetated for full rehabilitation.
2.2.3 Part B –Reclamation of Kosovo A Ash Dump

Environmental Measures

Short-term measures are realized for the existing dry ash handling system to reduce the dust emissions.

Tar deposit: Directly at the foot of the active western ash wing and in the Middle Western dump sector tar-like waste products of the gasification plant were deposited in two flat basins. These chemicals have been discharged in the ash dump and the old underground mining galleries lying below the dump. These tar deposits with a thickness of approx. 0.2 to 0.7 m were covered by cohesive material. The covering layer with a thickness of about 1 m is compacted by layers. The component of cleaning the hazardous waste on Gasification site, as part of the same project started (on 2010) later then Ash dump remediation. Under this component, 800 t of waste fraction “Liquid with Low Organic Content, which was treated on site through a chemical-physical process (oxidation by Fenton’s reaction) was stored at Kosovo A ash dump. This mass was covered with layers of ash and soil according to the environmental acceptable measures.

Removal of illegally disposed municipal waste on the western edge of the Kosovo A ash dump: Waste was dumped along the eastside of the way between Dardishte and Fushe Kosovo on a length of 400 m. In the northern part of the way, the waste consists of municipal waste dumped there by the residents, whereas in the southern part mainly construction waste was dumped. The total quantity was about 500 m³. These illegal waste deposits were removed before the earthwork measures started and deposited properly by means of light auxiliary equipment.

Removal of illegally disposed construction waste on the Kosovo A dump: Along an unpaved way leading to the Dragodan dump, construction waste was deposited. This waste came from the former plants of overburden dumping. It was deposited on an area of less than 0.1 ha; the volume was approximately ca. 400 m³. These materials are removed before the earthwork measures started and deposited properly. Owing to the size of the concrete elements heavy auxiliary equipment was used.

Protection of dangerous area around the collapsed undergrounds mine structures: The area east of the Dardishte village was marked by a high potential danger. The danger was caused by underground hollows from former mining activities as well as contaminations, caused by the dumping of byproducts of the old gasification plant. The extent of the danger, especially for the residents in the Dardishte village, was confirmed by an occurrence in March 2008, when an old ventilation shaft collapsed. The shaft was 36.5 m deep; The Reclamation Department also filled and reshaped the collapsed undergrounds mine structures on 6 hectares in Dardishte Village and constructed the drainage and the road Dardishte – Fushe Kosova.
Use of a water car: The accesses of the trucks were sprinkled with water permanently, in order to reduce the dust formation by the mobile equipment. This especially applied to the accesses for the ash dumps in the seasons with low rainfalls.

Operation at high wind velocities or extreme dryness: In ash operation removing of ash was interrupted in case of high wind velocities for reasons of dust formation.

Kosovo A Ash Dump and adjoining overburden dump

A detailed design for investigating, cleaning, reshaping and re-cultivating of the dumps has been provided by consulting companies, describing as well the necessary works and equipment needed for conducting such activities. By the year 2009 planned machinery and Heavy Equipment has been contracted. Staff selected by KEK headquarters has been trained to ensure that all equipment shall be used properly and to its fullest. Hydraulic excavator, five articulated dump trucks, tractor, water tank trailer, multi-purpose trailer, and rear assembly excavator for tractor were contracted later have been received and tested.
Pictures of the working process are presented below:

Heavy transportation vehicles

Working process

Works on ash dump

Works on covering the ash dump
The project concept coordinated with KEK and World Bank, after assessing different alternatives for the TPP A ash dump removal, contained the following technical measures:

Conversion of present dry dumping of TPP A ash to wet ash disposal: Dust formation would considerably be reduced by stopping of the ash dumping operation of the two spreaders on the dump. Wet ash disposal in the residual pit of the former Mirash East open cast mine field avoids dislocation of source of emission at the same time. The installation of the plants of the wet ash disposal was partly financed by KEK and by the CLR budget. (See Component / Part A).

Partial removal of ash and overburden from the instable areas of the ash dump: This refers especially to the parts where the high of the dump had a level up to 48 m. A lack of proper dumping technology caused these masses to be thrown in very high natural angles. In order to reach the stability, the geotechnical analyses suggested creation of stable slopes in proper angle and lowering the dump high. Therefore this mass needed to be removed to other safe areas of the ash dump via short transport distances.

Use of mobile equipment for the earth-work measures: The dumped ash masses created natural forms, which when being under influence of climatic condition, become solidified. In order to create stabilized forms, the dump needs to be reshaped and reformed according to the geotechnical designs. It is necessary to use the mobile heavy equipment for breaking the rough slopes, moving masses and reshaping the area according to the geotechnical designs.

Mass Removal
Based on the results of the site investigations and the accomplished soil-mechanical evaluations there were prepared earthwork measures. Before conducting the shaping works, the illegal waste disposal on the south outside dump of and in the collapsed underground mines, were removed and the basins with the tar deposits were excavated.

Removing of the south-western wing of the south ash dump: The south-west wing of the ash dump was embedded in an area dipping westward. This fact and the alternating deposition of ash dump and south overburden dump at the same time, led to a pressing out of the overburden masses by the load of the ash. This area was to be reshaped by removing the ash masses which were transported by trucks and distributed on an area specified ahead on a distance about 30 m, and reducing the high for approx. 10 m. The works were conducted during the rainy seasons. During the summer season the driveways and the working levels on the winning- as well as on the dumping side were sprinkled for reducing dust formation.

Recovery of cohesive overburden material for the shaping of the overburden dump near the ash dump: In particular the western part of the dump, which was additionally loaded by the overlying ash masses, tended to creeping slides and endangers residential houses west of the dump. Annually, the dump moved forward for about 1.5 m and especially in the rainy season. After reducing the load by the removing the ash, it was also be necessary to shape the overburden dump. The removed masses are used for covering parts of the ash dump in order to reduce both the infiltration of surface water into the ash dump on the one hand and the dust formation on the ash dump. The works were conducted during seasons with low precipitation. During the summer season the driveways leading across the ash was sprinkled for reducing dust formation.
Leveling: Apart from the earthwork measures described before, extensive grading works were carried out in the area under review. Before leveling the water accumulations in the sinks were pumped and discharged, respectively. Further leveling works were possible only when the dry dumping of ash was finished. The special design for ash dump suggested that the highest level on the dump should be 40 m, and general angle of slope to be 11°. Considering the fact that ash would be covered with 1 m of soil, the suggested high and slope angle was the solution that creates stability with requested insurance factor. The number of terraces varied according to the slope of dump and mostly imitated natural forms. In total there were remediated 123 hectares in Kosovo A ash deposit, and 56 hectares in the accompanying overburden dump. The objective of the project for this part was achieved and exceeded.

The drainage channels on ash dump were constructed on 3700 m length, all around the ash dump (see picture below), and with 3000 m length on accompanying overburden dump.

Drainage channels on ash dump and south overburden dump

Reclamation Measures
The rehabilitation measures suggested within the framework of this project were restricted to the north range of the dump and the accompanying overburden dump. These measures suggested mainly planting of grass on the soil covered northern part with a size of 40.5 ha, soil-covered western part 2.7 ha and overburden dump with a size of 89 ha. The Reclamation Department takes care only on cutting the grass periodically in order to prevent eventual fire from high temperatures during the summers. During the year 2017, there are going to be reshaped the last part with 30 hectares of the whole dump area.

Monitoring: A systematic air monitoring system has been implemented by six monitoring points (see picture below). Weekly and monthly reports are provided by KEK. Sampling was done monthly and samples were analyzed for weight and granulometry. These monitoring data served as a control measure for planned improvements of the ash dump operations.
The graph below shows the decreased level of dust from 2011 to the end of 2013, and by 2015 the level was below the level that the monitoring points could register.

Dust level monitoring from 2011 to 2015

Pictures below presents the ash dump aerial view on 2010 (left) compared to the 2016 (right)
2.2.4 Part C - Reclamation overburden dumps

This component was projected to mobilize existing KEK earth moving equipment and reclaim about 650 hectares of overburden land through investigation, reshaping and re-cultivating in order for the land to become usable again for community purposes. This land is in complete ownership of KEK. The total costs comprised site investigations, civil works, planting and greening areas. The activities included physical reshaping, construction of main and minor access roads, installation of a surface drainage system and planting of trees and mixed vegetation.

Lismir – Kuzmin overburden dump

This area covers around 782 hectares. The detailed site investigation report and design investigated the geological conditions, soil classification stability, sloping, water management, environmental situation and land use and concluded that the surface of the dump was more or less naturally re-greened, with a lot of (water filled), holes, slope movement, but also parts where agriculture was informally executed by neighboring villages.

The map below shows an overview of the original situation at the Lismir- Kuzmin Dump
The following range of reclamation measures were foreseen in the Lismir - Kuzmin Overburden Dump: (i) stabilization of dump areas; (ii) sloping and flattening of dump areas; (iii) construction of access roads; (iv) construction of drainage channels; (v) planting of trees. From the site investigations and the detailed design for the reclamation, there were also areas where reclamation was foreseen by natural vegetation due to the presence of waterholes and naturally occurring rare plant and animal species. In addition, waste was removed.

Mass Removal
Based on the results of the site investigations the northern part of the south dump was separated from the treatment in this project. Before starting the activities, the waste at the dump foot (SE 3) was removed and the water filled sinks were drained.

SM 1 Stabilization of the dump foot west of the village of Lismir: Within this area the cohesive overburden masses were dumped into a former brook bed without appropriate drainage
measures. The high water saturation of the dumped material and the underground dipping into the south east were the reason creeping slides continued west of Lizmir. In order to counteract this slide movement, the following measures were taken:
- The dump foot was drained by constructing drainage canals.
- Leveling of the entire dump west from Lizmir to avoid damming wetness and direct discharge of the surface water.
- The reduction of the dump height northwest of Lizmir in order to reduce the load.

The dump foot was slit by drainage channels along the foot on highest and lowest lines, with the channels not more than 1 m depth, because the type of soil limits the depths of the canals. The access roads were constructed on more than 3 km distance, in order to be able to access the dump areas, before and after reclamation.

**SM 1 view after remediation**

**SM 2 Reshaping of the instable areas between Lizmir and Kuzmin:** Within this area, reshaping of slopes is done in 1 section. The works were conducted during seasons with low precipitation as otherwise the area could not be accessed by the heavy equipment. Driveways on around 4 km were established in such a way that they didn’t affect the nature reserves. In the lower part of the dump the two ditches are combined to one ditch.

**Access roads and drainage canals**
SM 3 Reshaping of the steep eastern slope north of Lizmir: In this range the largest dump heights existed with partly 50 m. The outside dump stands here on horizontal ground; the general slope angle of the dump partly reaches 18 to 20°.

To ensure a permanent safety of the slope system, terracing of this slope system is implemented. The high of the terraces amount to 2 m, there is one terrace with larger width up to 60 m and three smaller. Below each terrace, the drainage channels were constructed on a length of 2650 m distance.

The works were conducted during seasons with low precipitation. Driveways were established as required to reduce transport distances.

Reshaping of the terraces

Drainage channels

Stabilizing Measures

Stabilizing and reshaping measures were planned on 88 ha (14 % of the area). The pastureland and the already existing and utilized fields were respected and not changed. On SM1 – dump foot, west of the village Lismir, 40 hectares of the land were stabilized, flattened and reshaped. The Lismir community, started to use it for agricultural purposes. On SM3- the areas on the eastern slope, north of Lismir, 23 hectares are re-cultivated with 60 000 forest trees. Since the planted area was not fenced, thus the grazing cattle could damage the new plants, Reclamation Department organized a special guarding until the plants increased their length enough to be out of risk. The Department also organized a weeding twice a year, in order to remove the risk from
fire and increase the percentage of survival rate among the trees. 87% of the planted trees were successful in this area.

South of the unpaved road from Lizmir to Bardh there are a 46.4 ha area with a lot of small waterholes. This area is reserved as protected natural area. The largest part of it was naturally cultivated on the basis of the site investigation and reclamation plan. It is intended that nature shall develop here undisturbed. The numerous waterholes provide habitats for rare plant and animal species. (See pictures below)

The area northern and eastern of the school in Lizmir was extensively used as municipal waste dump by the villagers. The quantity of waste was estimated to 2,000 m³, distributed on an area of
about 2 ha. Partly the waste was dumped into the seasonally water-filled sink, which is integrated in the drainage system of the outside dump. The contaminated area lied behind the overburden dump. Because of the direct vicinity to the area under review and the risk of surface water contamination, the KEK Reclamation Department cleared the site simultaneously.

Western of the village Lizmir was a further area contaminated with mostly domestic garbage. The garbage concentrated along the road between Lizmir and Bardh. The volume was estimated to 100 m³. The Reclamation Department removed this garbage with shovels and trucks, supported by manual clearing, constructed a road 800 m distance, then the road Lismir – Bardh of 1,8 km distance. The reclamation Department also helped on layering and shaping the school yard. The pictures below shows some of the activities mentioned above.
The overburden at Kalaja and Lugu i Thelle

An essential part of the opening-up masses of the Bardhi mine were stored in the outside dump Kalaja. The outside dump lies directly southwest of the Bardh village in the uphill terrain of the basement and consists of two main parts, the bigger eastern part (Kalaja) and the smaller western part (Lugu i Thell).

The outside dump Kalaja, dumped between 1964 and 1978 is formed by a more or less flat and wavy surface with a slight dipping in eastern direction. Also the former underground of the dump was dipping into eastern direction. The dump extends over an area of 164 ha and includes about 25 ml cm overburden. The thickness of the dumped overburden comes to 15 m in average. With the exception of the eastern side the dump is enclosed within the basement. The slope on the eastern side of the dump is located in a flat valley.

The outside dump Lugu i Thell lie on a higher level than the main part. The dump bench belt conveyor was built up along a hill slope. From this position about 4.6 ml cm of overburden were dumped over an area of 49 ha in the subjacent valley between 1988 and 1991. The foot of the slope leans against the opposite side of the valley. Risks for the public safety could not be observed. Some small plots at the northern as well as the southern boundary of the dump are used for agriculture.

Northern of the Kalaja dump is connected a small flat dumping area filled with overburden from the opening-up of the mine Bardh. This 41 ha large dump was build up in combination with trucks and train operation and contains an overburden volume of 3.2 ml cm only. The average thickness of this part of the dump comes to less than 8 m. The surface has been naturally re-greened despite the higher content of granular material from the opening-up. This 41 ha large dump was build up in combination with truck sand train operation and contains an overburden volume of 3.2 ml cm only. The average thickness of this part of the dump comes to less than 8 m. The surface has been naturally re-greened despite the higher content of granular material from the opening-up.
Land Use Concept

Kalaja outside dump is agriculturally used informally only in the western sector on an area of 19 ha. The preparation of the central horizontal area in Kalaja for agricultural use was also not recommended because of the proofed heavy metal concentration in the dumped material (despite the requirements of the residents in the adjacent villages). Two soil samples were taken at the Kalaja outside dump. The obtained results shows that cadmium values were found significantly lower and below accepted standards, but nickel concentrations are confirmed well above standards used for evaluation. Chromium was analyzed and also found close to or above standards. The problems related to nickel, chrome and potentially cadmium originate from overburden material which was not exposed to soil formations. In a separate academic study nickel was examined systematically in a profile from coal to surface and concentrations were also found in the order of hundreds mg/kg. Nickel and chrome are both considered phytotoxic and also toxic for humans when entering the food chain. Soil of this composition should not be used for agriculture or pasture.

Besides the agricultural use there was also a demand for firewood by the residents. Therefore the land use concept suggested the preparation of a plantation for fast growing trees in the central part of the dump Kalaja. In total, 65 hectares have been flattened and stabilized and 34 hectares are planted with 78000 forest trees. Because of the great size of area, a full fence was note
feasible, instead KEK appointed a guard to make sure that plants were not damaged by cattle’s and other animals. Comparing to Lismir-Kuzmin plants, the survival rate of the plants in Kalaja is around 60% as there were problems with weed competition, fires, rabbits that caused substantial amounts of seedlings not to survive.

![Planting works – Kalaja dump](image1)

The surfaces of the dump of Kalaja as well as the dump of Lugu i Thellë have self re-greened with grass, brushes and small trees. The western main part has been used for agriculture for some years, though this is not recommended and not in line with the land use concept. The dump is already optically integrated into the landscape. The drainage channels were constructed on 2200 m, on this overburden site.

![Construction of drainage channels on Kalaja overburden dump](image2)

Dump Kalaja already had existing ditches which are connected to the existing watercourses in the valleys with directions to the east and southeast.
Map of all overburden areas treated during the project
<table>
<thead>
<tr>
<th>Dump site</th>
<th>Stabilization of dump areas (in hect)</th>
<th>Sloping and flattening (hect)</th>
<th>Construct. of access roads (km)</th>
<th>Construct. of drainage channels (m)</th>
<th>Planting of trees (hect)</th>
<th>Total area treated (hect)</th>
<th>Areas where detailed design investigated as already suitable for community purposes (hect)</th>
<th>Contaminated land management/reclaimed (hect)</th>
<th>Areas to still be reclaimed by KEK in future (hect)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ash dump</td>
<td>123</td>
<td>123</td>
<td>6</td>
<td>3700 m</td>
<td>246</td>
<td>0</td>
<td>123</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>South Dragodani ash and overburden</td>
<td>56</td>
<td>56</td>
<td>3000 m</td>
<td>112</td>
<td>0</td>
<td>56</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total ash dump</strong></td>
<td><strong>179</strong></td>
<td><strong>179</strong></td>
<td><strong>6</strong></td>
<td><strong>6700 m</strong></td>
<td><strong>358</strong></td>
<td><strong>0</strong></td>
<td><strong>179</strong></td>
<td><strong>64</strong></td>
<td></td>
</tr>
<tr>
<td>South Lismir-Kuzmin Overburden</td>
<td>91</td>
<td>91</td>
<td>7</td>
<td>2650 m</td>
<td>23</td>
<td>205</td>
<td>681</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Kalaja and Lugu i thelle overburden</td>
<td>65</td>
<td>65</td>
<td>6</td>
<td>2200 m</td>
<td>34</td>
<td>164</td>
<td>330</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Vasiljeva overburden</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>79</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td><strong>Total overburden areas</strong></td>
<td><strong>156</strong></td>
<td><strong>156</strong></td>
<td><strong>13</strong></td>
<td><strong>4850 m</strong></td>
<td><strong>57</strong></td>
<td><strong>369</strong></td>
<td><strong>1090</strong></td>
<td><strong>1246</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

Table 2. Project target achievement

### 2.2.5 Part D: Project Management

This component provided support to KEK to implement the project. It included support for: (i) project management and technical assistance in such areas as detailed design, construction supervision, procurement and financial management; and (ii) monitoring and evaluation of project impacts, including implementation of an environmental management plan for construction activities carried out under the project.

The responsibilities of the PMU were to:
- Manage day-to-day project implementation, including, but not limited to, procurement, project monitoring and evaluation, financial management, progress and financial reporting in close cooperation with the Grant Unit of the Ministry of Economy and Finance;
- Prepare quarterly progress reports for KEK’s Board of Directors, the Association and the Project Coordination Committee (PCC);
- Draft Terms of Reference for consultant assignments;
- Function as the counterpart of the services provided from the grant;
- Review consultants’ reports and monitor the performance of the consultants;
- Serve as the Secretariat of the Project Coordination Committee and assist in follow up of activities approved by the PCC;
- Arrange for public consultations as required;
- Ensure that project subcomponents are completed on schedule and achieve their planned outcomes;
- Ensure that procurement and financial management are carried out in accordance with World Bank procedures and that the annual financial audit is submitted to the World Bank within 6 months of the close of the financial year;
- Maintain grant implementation records;
- Serve as the contact point for information on the grant; and
- Coordinate clean-up and reclamation activities with other KEK projects.

The PMU reported through the head of KEK’s Services Division to KEK’s Board of Directors and the PCC. The Board provided to the PMU Director, advice and recommendations on grant implementation.

The IDA grant provided funds for the first two years of the project to hire a PMU director and a procurement specialist, both with international experience. Office equipment and incremental operating costs were also financed by the grant.

The PMU monitored implementation of project activities and the performance of the consultants in accordance with the contracts, reviewed and approved the consultants’ inception reports, mid-term reports, and final reports. A quarterly report on project implementation was submitted by the PMU through UNMIK to the Association as per the formats agreed during Negotiations.

The grant unit in the Ministry of Economy and Finance assisted in the reporting as well as in the disbursement procedures. An external auditor was appointed to audit the financial statements of the project and the cost of the annual project audits will be paid from the Grant. Procurement activities were carried out in accordance with the World Bank’s Guidelines by KEK through its PMU.

The CLR-Project was established as independent structural unit within KEK. Mainly consisted of the personnel recruited from KEK and had partly also own equipment financed by the World Bank budget. KEK plans to allocate this department to the new opencast mine if activities in this mine will prevail against the active mines.

Initiated on 2007 as part of the project, the Reclamation Department was created and started operating on 2009. The main goal of this Department was to continue with the good environmental international practices on land reclamation after mining activities. The Department was equipped with heavy vehicles and necessary tools by the project and partially from KEK, in order to be fully operational. There are 52 employees engaged in this Department, who successfully got trained by the expert of the project.

### 2.2.6 Part E: Hazardous Chemicals Clean-up at the Kosovo A Gasification Site

The main goal of the project was to remove the hazardous compounds in order to bring significant benefits in terms of eliminating the risks and concern for negative effects on public health and for potentially environmental impacts arising from the actual situation. In particular, the clean-up project aims to dispose of ca. 20’000 t of hazardous wastes from the following storage facilities:
- 12 vertical and 16 horizontal tanks
- 156 barrels
- 2 open basins
- 1 open tar deposit

Ca. 15’000 t of liquids with low organic contents could be treated on site by chemical physical...
Treatment, while Ca. 7’300 t of residue fractions consisting of liquids with high organic content, solvents, diisopropylether and tar residues have to be transported outside Kosovo and disposed of in cement plants and hazardous waste incineration plants.

Initially a design and investigation contract for the gasification plant clean-up has been signed. The investigation results and interim report have been available in the first quarter 2009. A contract was signed for Environmental Impact Assessment of this report as a necessity prior start-up of any physical works on removal/treatment of these hazard materials. EIA was finalized where the final inputs came from the second Public hearing, held on January 27th, 2010. EIA
report was completed and with this report we assured Environmental Consent from Ministry of Environment and Spatial Planning. The contract with EPE/MOURIK consortium got signed early in 2011 and meanwhile the selection of the International Supervision Company to supervise the works in gasification Site was conducted. Both contractors started their works on site and the first step was to prepare the infrastructure: the construction of access roads, as well as fortified areas for storage and manipulation was begun. The negotiations with other possible disposers and countries turned out to be very difficult because Kosovo is not a member of the Basel Convention. This problem was solved by having in place the bilateral agreements between Republic of Kosovo (as country of origin of the hazard waste) and receiving countries Belgium, Sweden as most hazard waste was foreseen to be finally disposed in those countries. Permits were granted by Ministry of Environment and Spatial planning in December while the bilateral agreements have been signed in February 2012 and then were forwarded to respective authorities in the recipient Countries. All of the waste that had to leave Kosovo was already packed in IBC containers, meaning that metal reservoirs have been emptied, cleaned and handed over clean to KEK.

The pilot test for cleaning up the Liquids with Low Organic Content (LLOC) started on the 13th of August and was completed on September 7th, 2011. The pilot test showed that 3 times more than the planned, of chemicals necessary to remove the phenols. Also, since the discharge limits for the parameters chemical oxygen Demand (COD), Total Organic Carbon (TOC) and Sulphates cannot reach, an exemption for temporary discharging limit was granted by the Ministry of Environment and Spatial Planning on the basis of detailed analysis of low environmental impacts from the sulphate discharge. Below are shown the pictures from the process of site preparation and cleaning process.

Site preparations

Construction of decontaminated areas and pavement for vehicle measurements

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Work process on cleaning

Sampling and works on confined spaces

Packaging and transportation process
A double or in some cases triple analysis (in three independent labs) of heavy metals, phenols, sulphates, sulphides, COD and TOC ensured the quality of the permitted discharge limits and the filter cake containing the particular residues from the Fenton reaction. Regular measurements of the impact of the work on the environment do not show any exceeding of limits. By mid April 2012, all 30 basins have been treated completing as such the local treatment of 14,755 tons of Liquid with Low Organic Content (LLOC).

During the works, PMU in coordination with the KEK requested from the contractor to do a sampling of the underground tank B5 that wasn’t included initially on inventory list. The B5 tank has volume of approximately 100m3, filled with a mixture of solvents, creating a high risk for the workers and anyone else that could use the area in the future.

The contractor cleaned the tank and by completion of these activities, all the works under this component have been successfully completed. Therefore, under this project component, there have been treated totally:

- **7,300 tons LHOC exported outside the country.**
- **14,755 tons of LLOC treated on site.**
- **494 big bags (approx. 550 t) left on site,** but repackaged and safely stored in warehouse (see picture).

![Bags stored inside the warehouse](image)

![Before and after cleaning process](image)
2.2.7 Part F – MESP Environmental Monitoring and Management

This component aimed at improving the functioning of the examination and monitoring of MESP with regard to environmental and social impacts of large power plant projects by providing goods, works and technical assistance, including:

(i) Air Quality monitoring stations to have reliable data on air quality;
(ii) Soil and Water Monitoring program to collect reliable data on actual pollution,
(iii) Environmental and Social Impact Assessment for the proposed Kosova Power Project;
(iv) Monitoring of the RAP implementation of the Shala Neighborhood;
(v) Panel of experts established to assist on ESIA and monitoring of RAP; and
(vi) Low carbon energy growth study
(vii) Study Tour to Poland

It is important to mention that all above mentioned activities were aimed to improve the quality of the works within MESP and also to provide accurate data, needed for successful and credible ESIA document to be prepared for the Kosova e Re Power Plant.

(i) Air Quality monitoring stations;

These stations were aimed initially to be purchased under Lignite Power Technical Assistance Project (LPTAP) but since the project was closed, it was foreseen that these stations be transferred to the CLRP-AF project. Based on the analysis and wind rose developed by HMIK (Hydro-meteorological Institute of Kosovo) best possible locations for these AQM stations were selected. These locations were in the municipality of Obiliq, all nearby the power plant and distributed to have best area coverage (refer to the map below)
As locations where the stations would be installed, had to have continuous power supply, the project in cooperation with municipality of Obiliq and KEK had chosen three public locations that would accommodate these stations:

<table>
<thead>
<tr>
<th>Local code of the station</th>
<th>Name of the station</th>
<th>Managed by:</th>
<th>Measured parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>KS0110</td>
<td>Obiliq-Healthcare center</td>
<td>KEPA/ HMIK</td>
<td>SO₂, NO₂, CO, O₃, PM₁₀/PM₂₅</td>
</tr>
<tr>
<td>KS0111</td>
<td>Dardhishte-Primary School</td>
<td>KEPA/ HMIK</td>
<td>SO₂, NO₂, CO, O₃, PM₁₀/PM₂₅</td>
</tr>
<tr>
<td>KS0112</td>
<td>Palaj-Kosova Mont</td>
<td>KEPA/ HMIK</td>
<td>SO₂, NO₂, CO, O₃, PM₁₀/PM₂₅</td>
</tr>
</tbody>
</table>

So as seen from the table, AQM stations were designed to measure parameters of SO₂, NO₂, CO, O₃, PM₁₀/PM₂₅ continuously and report to HMIK on real-time basis. Additionally to above mentioned parameters, also wind speed and direction, pressure and air humidity were measured.
These continuous air monitoring stations had served best for what they were designated and provided continuous data for the experts in charge for preparing Air Quality and Air modelling chapters of the ESIA document. They were procured and financed under the CLRP.

All these data were required to have clear picture on actual situation and to make future assumptions with new power units in operation. Also the data is submitted to the Kosovo Hydrometerological Institute which is using the data together with data from the stations across the rest of Kosovo in monthly and yearly state of the air quality reports.

(ii) Soil and Water Monitoring program

The main objectives of the assignment were the collection of field data with focus on soil, surface water and groundwater to close the data gaps of the existing environmental database mentioned above in order to provide sufficient environmental baseline data for a fully elaborated ESIA with regard to

- future lignite open cast mining activities in the Sibovc South lignite license area earmarked for coal supply under consideration of the abundant mining activities in Bardh and Mirash open cast mines as well as already abundant open cast and underground mining activities

- disposal of ash and waste water under consideration of existing TPPs Kosovo A and B

- fresh water supply under consideration of existing TPPs Kosovo A and B fresh water consumption

The assignment included the following major tasks and issues:

- Sampling and analysis of surface water
- Sampling and analysis of waste water
- Sampling and analysis of ground water from existing wells and new drills
- Drilling and lining of new GWM, documentation of ground water levels in new and existing GWM
- Reporting (maps, coordinates, documentation of drilling and lining of GWM, sampling reports and analysis results, basic assessment/evaluation of analysis results)
- Measuring of flow rates of selected rivers and creeks in the area

There were two sampling campaigns undertaken during this assignment, while the number of the total samples (soil, surface water and groundwater) are shown below:

<table>
<thead>
<tr>
<th>Type of the sample</th>
<th>Number of sampling points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>60</td>
</tr>
<tr>
<td>Surface water</td>
<td>35</td>
</tr>
<tr>
<td>Ground water</td>
<td>29</td>
</tr>
<tr>
<td>Waste water</td>
<td>14</td>
</tr>
<tr>
<td>River sediments</td>
<td>24</td>
</tr>
</tbody>
</table>

For illustrative purposes, KEK area and groundwater sampling points are shown in the map below
(iii) Environmental and Social Impact Assessment

The environmental and social impact assessment of the proposed Kosova Power Project was the most important assignment of the project, as also other complementary studies prepared showed this. It is known that it is the responsibility of the developer, in this case the winning private sector bidder to prepare the Environmental and Social Impact Assessment for each of the separate sub-projects subject to national legal requirements. For the proposed KPP, the Government and the World Bank agreed to make efficient use of time and until the award of that specific concession in order for the Government to commence the preparation of an Environmental and Social Impact Assessment (ESIA) for the proposed KPP.

The ToR’s of the study were prepared very carefully and discussed with different local and international stakeholders to make sure that all relevant standards are being followed. After a procurement process, a consortium of companies from Croatia, Slovenia, Bosnia and Kosovo had won the tender to prepare the ESIA.

The process of the ESIA was a long process, with a lot of difficulties during the implementation, while reason for this could be different, but it would be worth to mention some: one of the most important was that consultants responsible to prepare the ESIA didn’t understand in the beginning that the ESIA we wanted them to prepare was not a document meant to be highly technical and on the other side also not knowing the final technology that was going to be used, made the document quite voluminous treating different types of technologies in different conditions.
Finally after agreeing with the right version of the document, the consultant prepared the Scoping study as required by TOR, and after discussing it also in the stakeholder committee (a committee with members from MESP, MoF, MED, Municipality of Obiliq and KEK) agreed to make it publicly available and to hold a public debate with the affected people of the municipality of Obiliq. During the public debate the consultant presented the document and alternatives that were considered and after the comments received the document was finalized.

It should be noted that during this assignment, the public information office (PIO) was established and served together with municipality of Obiliq to the concerned people. Under this project there was a full time employee who was stationed within the municipality building to keep people up to date with the information from the project and raise further concerns or complaints in case they had.

Last but not least, also a web-site was established in order to provide more information related to the document and latest notifications related to ESIA. Where interested parties could read and download monthly Air Quality Reports (from HMIK), latest version of the ESIA and other related studies such as soil and water monitoring program.

Throughout the process, the project team was assisted by the Panel of Expert, who were international experts with experience on environment and social issues according to standards of International Financial Institutions (IFI). This part will be further elaborated in next section.

The ESIA was delivered draft, due to reached agreement between GoK and private investors which was not foreseen by the actual ToR’s of the actual ESIA. The process has now started to revise the ESIA for update to the new power plant configuration.

(iv) Monitoring of the RAP implementation of the Shala Neighborhood

Since one of the three objectives of the Clean-up and Land Reclamation-AF project there was also the objective to support KEK and the Ministry of Environment and Spatial Planning (MESP) to implement continued clean-up operations and environmental good practices in the mining and energy sector, this assignment was related to what was said above and exclusively for resettlement.

As part of the this objective described above the AF-CLRP included a component aimed at improving the review and monitoring function of the MESP in relation to the environmental and social implications of large power sector projects and in particular the preparation of the Kosovo Power Project (KPP), which was being supported by a separate WB operation. The aforementioned component included resources for, among other, the following activities: (a) the Environmental and Social Impact Assessment (ESIA) for the proposed KPP; (b) international ESIA and Resettlement Panel of Experts; and (c) monitoring of the implementation by the Hade Project office under the MESP of the RAP for the Shala neighborhood of Hade village in accordance with the World Bank's Operational Policy on Involuntary Resettlement 4.12 (OP 4.12) and International Finance Corporation's (IFC) Performance Standard 5 on Land Acquisition and Involuntary Resettlement (PS5).
Therefore to help the project comply with above mentioned standards there was a consultant hired to provide Consultant Services for the Monitoring of the Resettlement Action Plan (RAP) for the Shala neighborhood of Hade village are aimed at supporting activity (c) above and continue the work conducted by rePlan under a previous contract between 2010 and 2012.

During this assignment the engaged consultant monitored the resettlement process which took place in the new location designated for future resettlements. The consultant during this period produced two monitoring reports with the insights from the field visits and also a resettlement completion audit followed by a stakeholder workshop. The Resettlement Completion Report also contained an Executive Summary which was publicly disclosed followed by public discussion with the project affected people.

(v) Panel of Experts (PoE) established to assist on ESIA and monitoring of RAP

During project implementation also two experts (social and environmental) were engaged. These experts had a crucial role in advising PIU and also companies on IFI standards to be followed during implementation of ESIA and RAP.

ESIA and RAP Panel of experts had the following objectives: (a) to ensure due diligence and international quality standards in the studies, including integration of international standards for data, methodologies, benchmarks for impacts, and design criteria; (b) to provide high level and professional independent advice and guidance to support objectivity and credibility in the assessment process, and (c) to share technical expertise and knowledge and so contribute to dialogue amongst Consultants, the Government of Kosovo and other stakeholders. The primary outcome from their effort was to ensure international standards of the study, risk evaluation and impact assessment are met, and to assure a level of confidence amongst the international community in the quality and integrity of the assessment process and findings.

POE members were experts with a broad knowledge of environmental, social, and technical impacts and issues associated with open cast mine development and large scale coal and lignite fired power projects. Furthermore, they had full understanding and were knowledgeable in recent EU Directives, BREFs and World Bank and EBRD Safeguard Policies and procedures required for a “Category A” project. The POE worked as an integrated team; Experts did not only address their own area of expertise, but contributed to the interdisciplinary work of the POE. Their collective professional knowledge and experience allowed them to address the following broad areas of importance to the ESIA, including but not limited to: institutional aspects, technical issues/design options and alternatives (particularly for pollution control), social and environmental impact data requirements and impact analysis, resettlement and economic rehabilitation projects, and public consultation and disclosure procedures.

(vi) Low carbon energy growth study

Low carbon energy growth study was part of the project as an initiative from World Bank, not only to consider fossil fueled energy but also to have a broad perspective on other renewable energy sources as well as energy efficiency and their cost reflections as well. In order to complete this study a company ECOFYS, was engaged with extensive experience in similar studies. Below are described the scopes of the services undertaken under this assignment as well as the findings.
Task 1: Review the Climate Change Strategy and other relevant background documents
The Consultant had to review all available background documents, in particular: (i) the Climate Change Strategy; (ii) the activities undertaken by Ministry of Economic Development (MED) to meet the EU 20-20-20 targets in the framework of the Energy Community treaty, including the Renewable Energy Action Plan and Energy Efficiency Action Plan; (iii) the several projects to reduce Greenhouse Gases (GHG) in buildings and other sectors, such as the Energy Efficiency and Renewable Energy Project, financed by the World Bank and implemented by the MED and other donor financed GHG projects, such as from KfW, USAID and the EU.

Task 2: Identification of key Greenhouse Gas emission reduction measures for key sectors, greenhouse gas reduction potential and associated costs and investment needs
The Consultant had identified the key emission reduction measures which exist in the key sectors in Kosovo, estimated the greenhouse gas reduction potential as well as the associated costs and investment needs that are required in order to realize this reduction. The consultant had also identified the measures and actions which were already being realized and have secured funding, the reduction potential which was estimated to be realized through these projects already being implemented and for the remaining measures, the key parties which would carry the investments required.

Task 3: Preparation of Greenhouse Gas Abatement Costs curves
The purpose of this task was to provide a clear overview of all type of measures required for Kosovo to meet its obligations towards the European Union and for Kosovo to follow a low carbon development path, its investment costs and the greenhouse gas emission reduction potential. This task modeled the measures required based on 3 different scenarios in terms of greenhouse gas reductions and compared this with a business as usual model scenario.

Task 4: Training of MED and MESP on Greenhouse Gas Abatement Costs Curves and establishment of database
The Consultant established a database containing the different type of measures, the estimated investment costs and greenhouse gas emission reduction potential in the key sectors in the MESP and MED, provided the model for the Greenhouse Gas Abatement Costs Curves and provided a 4 day training to Kosovo officials on how to maintain the database and model the Greenhouse Gas Abatement Costs Curves when updated information becomes available in the future.

Marginal abatement cost for 2024 projection for Kosovo, which came out as a result of this study is shown below:
(vii) Study Tour to Poland

Purpose of the study tour was to strengthen the capacity within the Ministry of Environment and Spatial Planning, the Kosovo Environmental Protection Agency and its inspectorates and the Ministry of Economic Development in the field of lignite-fired power plants, including open cast mining, in the following areas: (i) Environmental Impact Assessment for new power plants and how the review and quality control is organized; (ii) permitting tasks as they are defined in Integrated Pollution Prevention and Control legislation (IPPC) and key elements of IPPC permit including application and approval procedures¹; (iii) frequency and type of inspections to monitor compliance with the permit conditions, (iv) emission registry including emission monitoring obligations for industries and submission requirements to authorities, (v) Best Available Techniques for lignite fired power plants; and (vi) site visit to 3 recently constructed or renovated lignite fired power plants to view their environmental compliance, emission monitoring regime and environmental investments.

Lignite fired power plants preferably in the range of 300 MW (small units) ranging until 500 MW as the 300 MW units are most comparable to the planned unit size in Poland. The idea of

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¹ Including guidelines and manuals used in the Ministry for IPPC applications and permits. And branch guidelines for the energy sector.
The study tour was also to visit power plants which use Pulverized Coal Combustion (PCC) technologies and units who use atmospheric circulated fluidized bed combustion (CFBC) and perhaps different type of cooling systems direct once-through cooling (Patnow II). Key plants in Poland who were built in the last 10 years and visited are:

<table>
<thead>
<tr>
<th>Plant</th>
<th>Owner/Operator</th>
<th>Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belchatów II</td>
<td>PGE/BOT Elektronia Belchatów SA.</td>
<td>1 x 858</td>
</tr>
<tr>
<td>Patnow II</td>
<td>Elektrowni Patnów-Adamów-Konin SA (ZE PAK SA.)</td>
<td>1 x 464</td>
</tr>
<tr>
<td>Turow 4, 5, 6</td>
<td>Turow Power Plant S.A.</td>
<td>3 x 262</td>
</tr>
</tbody>
</table>

3 PROGRAM SUSTAINABILITY

Sustainability of the program was achieved through capacity building of the implementing agency and other participating institutions. KEK’s capacity in lignite mining operations was enhanced by developing integrated approach to deal with environmental legacy issues from lignite mining and power generation activities. By building capacity within KEK and environmental officials in central and local Government, the clean-up activities substantially reduced the environmental pollution created by the ash deposited in the open ash dump.

This project and its implementation model can be used for other similar projects, as a good example with significant results.

The sustainability was also achieved by investigation of the site using international good practice to remove, package, and export for incineration or reprocessing of chemicals including phenol, benzene and tarry residuals.

The capacity building subcomponent of the Grant included:

a) Training of the local staff of MESP, MF, KEK, Municipality of Obiliq and PMU
b) Forming a new Reclamation Department within Mining Division, in order to continue with using international good practice on remediation and land reclamation
c) Site visit to the RWE mining facilities in Germany. The purpose of the site visit is to study closely the successful implementation of the IPPC permitting procedures, IED compliance and other environmental permitting procedures for the lignite-fired power plants in Germany.

4 INSTITUTIONAL ARRANGEMENT AND STAKEHOLDERS FOR PROGRAM IMPLEMENTATION

KEK is the main project beneficiary and implementing agency. As the implementing agency, KEK was responsible for day-to-day project management, including hiring and supervising consultants.

Internationally experienced specialists for the PMU were financed by the grant under component D. A Project Coordination Committee (PCC) was established to provide advice and monitor project execution, and oversee coordination between KEK and local and central authorities.

MEM, MESP and the Municipality of Obiliq played an advisory role and coordinated activities such as the preparation of the EIA and the land use plan.
The PCC was chaired by the Minister of MESP or higher duly authorized delegate and included representatives from KEK, the Kosovo Trust Agency (KTA), the Ministry of Energy and Mining, the Independent Commission of Mines and Minerals (ICMM), and the Municipality of Obiliq. Representation in the PCC required participation from all key institutions that have involvement or an interest in one or more of the aspects of implementation. The Chair of the PCC convened regular meetings throughout the implementation of the Grant. Attendance by representatives of the KTA, KEK, MEM, MESP and the Municipality of Obiliq were mandatory.

The detailed functions and responsibilities of the PCC and the PMU were defined in an Operations Manual, which was adopted after project effectiveness.

The key responsibilities of the PCC were to:
- Coordinate the activities of the various agencies involved in the implementation of subcomponents, especially those related to environmental and social aspects (regulatory supervision particularly from MESP and MEM);
- Ensure consultation with local institutions, donors and other stakeholders as appropriate, based on recommendations from the PMU;
- Review the PMU’s quarterly Progress reports;
- Advise KEK’s Board of Directors on project execution and progress;

The PMU was to serve as the Secretariat for the PCC and prepare and distribute the Minutes / Agenda for each PCC Meeting.

5 IMPLEMENTATIONS ISSUES ENCOUNTERED

One of the issues encountered was that, the design of the Wet Ash System and construction works were reviewed several times so there were delays on completing the works. The reasons claimed by the contractor were: (i) the addition of metal detectors and crushers to the scope of works for the wet ash system, which had to be integrated into the procurement process to ensure proper functioning of the wet ash system, (ii) the amount of extra underground water discovered on site, and (iii) additional time required for clarification technical designs. The other issues encountered were also that the contractor was supplied with materials from local subcontractors (against specifications on the contract) and later on tended to have problems with fulfilling the responsibilities derived from the contract, in context of delivering proper invoices and payment processing from KEK.

The implementation of some of the components such as Component E was delayed as a result of difficulties of the export permits from the Ministry of Environment and spatial planning. Parallel to the works, the efforts to get the necessary import permits, export contracts and usage permits for the various chemicals were commenced. The negotiations with other possible disposers and countries turned out to be very difficult because Kosovo was not a member of the Basel Convention. This problem had to be solved by having in place the bilateral agreements between Republic of Kosova (as country of origin of the hazard waste) and receiving countries like Belgium, Germany, Sweden and Bulgaria as most hazard waste is foreseen to be finally disposed in those countries. Export permits were granted by Ministry of Environment and Spatial planning in December while the bilateral agreements have been signed in February 2012 and then were
forwarded to respective authorities in the recipient Countries. It took a year, on the first time, and six months on the second time, for the export permits to be granted for the project.

The works sometimes were delayed due to specific working conditions on ash dump, damaging twice faster spare parts of the equipment. This type of work required very intensive maintenance in order to follow with the working dynamic. KEK contracted a maintenance operator, for maintaining all the equipment of mining division but their service did not satisfy our equipment requirements. As a result, many times the excavators were out of use for several months.
Annex 8. Comments of Cofinanciers and Other Partners/Stakeholders

N/A
Annex 9. List of Supporting Documents

- Restructuring Paper of June 3, 2009
- Project and Restructuring Paper of March 28, 2013 (Report No: 73115-XK)
- Restructuring Paper of June 29, 2015 (Report No: RES19837)
- Implementation Status Reports number 1 through 18
- Mid-Term Review
- Aide Memoires
- Borrower’s Project Completion Report
- World Bank’s Interim Strategy Note (ISN) for Kosovo
- Law No. 05/L – 044 On The Environmentally Endangered Zone Of Obiliq And Its Surroundings, Republic of Kosovo, Assembly
- Soil and Water Sampling and Analysis Program, GEOtest. August, 2014
- Site Investigation, Vattenfall Europe Mining AG and Deutsche Montan Technologie GmbH. April, 2008