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INSP/R2011-0009

November 30, 2011

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FROM: Vice President and Corporate Secretary

**INSPECTION PANEL**

**South Africa - Eskom Investment Support Project**

**Inspection Panel Investigation Report**

1. Attached is a memorandum from the Executive Secretary of the Inspection Panel dated November 21, 2011, transmitting a memorandum to the Executive Directors from the Chairman of the Inspection Panel entitled "Inspection Panel Investigation Report - South Africa - Eskom Investment Support Project (IBRD Loan No. 78620-ZA)".
2. In accordance with paragraph 23 of the Resolutions establishing the Inspection Panel "within six weeks from receiving the Panel's findings, Management will submit to the Executive Directors for their consideration a report indicating its recommendations in response to such findings". Management's report will be circulated in due course.

Distribution:


Executive Directors and Alternates  
President  
Bank Group Senior Management  
Vice Presidents, Bank, IFC and MIGA  
Directors and Department Heads, Bank, IFC and MIGA  
Inspection Panel

THE INSPECTION PANEL

# OFFICE MEMORANDUM

DATE: November 21, 2011

TO: Mr. Jorge Familiar Calderón, Vice President and Corporate Secretary, SECV

FROM: Peter L. Lallas, Executive Secretary, IPN 

EXTENSION: 39732

SUBJECT: **Request for Inspection**  
**SOUTH AFRICA: Eskom Investment Support Project**  
**(IBRD Loan No. 78620-ZA)**  
**Investigation Report**

Attached for distribution to the Executive Directors of IBRD, please find a memorandum from the Chairperson of the Inspection Panel entitled "*SOUTH AFRICA: Eskom Investment Support Project (IBRD Loan No. 78620-ZA—Investigation Report)*," dated November 21, 2011.

Enclosures



**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION  
THE INSPECTION PANEL**

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**Roberto Lenton**  
Chairperson

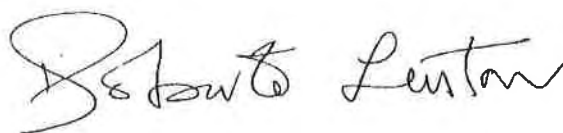
**IPN REQUEST RQ 10/03**

November 21, 2011

**MEMORANDUM TO THE EXECUTIVE DIRECTORS AND ALTERNATES  
OF THE INTERNATIONAL BANK FOR RECONSTRUCTION  
AND DEVELOPMENT**

**Request for Inspection  
SOUTH AFRICA: Eskom Investment Support Project (IBRD Loan No. 78620-ZA)  
Investigation Report**

Please find attached the Inspection Panel Investigation Report entitled "*SOUTH AFRICA: Eskom Investment Support Project (IBRD Loan No. 78620-ZA)*," dated November 21, 2011.



Attachment





**INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION**  
**THE INSPECTION PANEL**

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**Roberto Lenton**  
**Chairperson**

**IPN REQUEST RQ 10/03**

November 21, 2011

**MEMORANDUM TO THE PRESIDENT  
OF THE INTERNATIONAL BANK FOR RECONSTRUCTION  
AND DEVELOPMENT**

**Request for Inspection  
SOUTH AFRICA: Eskom Investment Support Project (IBRD Loan No. 78620-ZA)  
Investigation Report**

Please find attached the Inspection Panel Investigation Report entitled "*SOUTH AFRICA: Eskom Investment Support Project (IBRD Loan No. 78620-ZA)*," dated November 21, 2011.



Enclosure



**Report No. 64977-ZA**

**The Inspection Panel**



# **Investigation Report**

**South Africa: Eskom Investment  
Support Project  
(IBRD Loan No. 78620-ZA)**

**November 21, 2011**



## About the Panel

The Inspection Panel was created in September 1993 by the Board of Executive Directors of the World Bank to serve as an independent mechanism to ensure accountability in Bank operations with respect to its policies and procedures. The Inspection Panel is an instrument for groups of two or more private citizens who believe that they or their interests have been or could be harmed by Bank-financed activities to present their concerns through a Request for Inspection. In short, the Panel provides a link between the Bank and the people who are likely to be affected by the projects it finances.

Members of the Panel are selected “*on the basis of their ability to deal thoroughly and fairly with the request brought to them, their integrity and their independence from the Bank’s Management, and their exposure to developmental issues and to living conditions in developing countries.*”<sup>1</sup> The three-member Panel is empowered, subject to Board approval, to investigate problems that are alleged to have arisen as a result of the Bank having failed to comply with its own operating policies and procedures.

The Panel’s work embraces the fundamental principles of independence, integrity, and impartiality. These cornerstone principles enable the Panel to respond to the issues raised and to provide technically sound, independent assessments to the Bank’s Board.

### Processing Requests

After the Panel receives a Request for Inspection, it is processed as follows:

- The Panel decides whether the Request is *prima facie* not barred from Panel consideration.
- The Panel registers the Request—a purely administrative procedure.
- The Panel sends the Request to Bank Management, which has 21 working days to respond to the allegations of the Requesters.
- The Panel then conducts a short 21 working-day assessment to determine the eligibility of the Requesters and the Request.
- If the Panel recommends an investigation, and the Board approves it, the Panel undertakes a full investigation, which is not time-bound.
- If the Panel does not recommend an investigation, the Board of Executive Directors may still instruct the Panel to conduct an investigation if warranted.
- Three days after the Board decides on whether or not an investigation should be carried out, the Panel’s Report (including the Request for Inspection and Management’s Response) is publicly available through the Panel’s website and Secretariat, the Bank’s Info Shop and the respective Bank Country Office.

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<sup>1</sup> IBRD Resolution No. 93-10; IDA Resolution No. 93-6.

- When the Panel completes an investigation, it sends its findings and conclusions on the matters alleged in the Request for Inspection to the Board as well as to Bank Management.
- The Bank Management then has six weeks to submit its recommendations to the Board on what actions the Bank would take in response to the Panel's findings and conclusions.
- The Board then takes the final decision on what should be done based on the Panel's findings and the Bank Management's recommendations.
- Three days after the Board's decision, the Panel's Report and Management's Recommendation are publicly available through the Panel's website and Secretariat, the Bank's Project website, the Bank's Info Shop and the respective Bank Country Office.

## Acknowledgments

The preparation of this Report would not have been possible without the support and valuable contributions of many people.

The Panel wishes to thank the Requesters and the communities who met with the Panel in the Project area. The Panel expresses its appreciation to the national and local government officials in South Africa and representatives of Eskom Holdings Limited with whom the Panel met in South Africa.

The Panel also wishes to thank World Bank Executive Board members for their support, the World Bank Staff in Washington D.C. for their assistance in obtaining documents, providing the Panel with information, and responding promptly to written requests, and in the South Africa Country Office for their assistance.

The Panel also wishes to extend its thanks to the members of civil society organizations working in South Africa who assisted the Panel team during its field visits, and to *The Bateleurs (Flying for the Environment in Africa)* who flew the Panel team over the Medupi project area and enabled it to get an invaluable aerial view of the landscape.

The Panel is grateful for the expert advice provided by its consultants: Susan Frances Brownlie, environmental impact assessment expert; Mark Hodges, air quality expert; Jacob Kijne, water resources expert; Anthony Leiman, energy economics expert; Mohan Munasinghe, climate change expert; and William Ward, economics expert and appreciates the objective judgment and professionalism they exhibited at all times.

The Panel also wishes to thank Jennifer Hatch, Matthew Irish, and Dylan Rebois who provided exemplary research assistance during the preparation of this report.

Finally, the Panel wishes to convey its gratitude and appreciation to the members of its Secretariat for their resourceful handling of this investigation, in particular to the Panel's Executive Secretary Peter Lallas, Operations Officer Mishka Zaman who served as Lead Secretariat Officer for this investigation, Advisor to the Panel Secretariat and Expert Consultant on institutional matters Eduardo Abbott, and other members of the Secretariat for their support during the finalization of the report.



## Acronyms and Abbreviations

AMD	Acid Mine Drainage
AQIA	Air Quality Impact Assessment
CSP	Concentrating Solar Power
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs (formerly DEAT)
DEAT	Department of Environmental Affairs and Tourism
DEDET	Department of Economic Development, Environment, and Tourism
DME	Department of Minerals and Energy
DMR	Department of Mineral Resources (formerly DME)
DSM	Demand-Side Management
DWA	Department of Water Affairs (formerly DWAF)
DWAF	Department of Water Affairs and Forestry
EA	Environmental Assessment
ECA	Environment Conservation Act 73 of 1989
EHS	Environment, Health and Safety Guidelines (World Bank Group)
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EISP	Eskom Investment Support Project
EMF	Environmental Management Framework
EMPR	Environmental Management Program Report
ENPV	Economic Net Present Value
ERR	Economic Rate of Return
FBE	Free Basic Electricity
FGD	Flue Gas Desulfurization
GEF	Global Environment Fund
GoSA	Government of South Africa
GHG	Greenhouse Gas
IDP	Integrated Development Plan
IPN	Inspection Panel
IRP2	Integrated Resource Plan for Electricity (Revision 2)
Km	Kilometer
kWH	Kilowatt hours
LTMS	Long Term Mitigation Scenarios
Mm <sup>3</sup> /yr	Million cubic meters per year
Mtpa	Million tonnes a year
MCWAP	Mokolo-Crocodile (West) Water Augmentation Project
M&E	Monitoring and Evaluation
MPRDA	Minerals and Petroleum Resources Development Act 28 of 2002
MW	Megawatt
NEM	National Environmental Management (prefix for specific Acts promulgated in terms of the NEMA, e.g. NEM Biodiversity Act)
NERSA	National Energy Regulator of South Africa
NEMA	National Environmental Management Act 107 of 1998
NHRA	National Heritage Resources Act 25 of 1999
NEPAD	New Partnership for Africa's Development
NPA	National Prosecuting Authority

OPCS	Operations Policy and Country Services Department
PAD	Project Appraisal Document
PF	Pulverized Fuel
RoD	Record of Decision
RESA	Regional Environmental and Social Assessment
SDF	Spatial Development Framework
SDR	Safeguards Diagnostic Review
SEA	Strategic Environmental Assessment
SAHRA	South African Heritage Resources Authority
SADC	Southern African Development Community
SPAs	Special Pricing Agreements
UNFCCC	United Nations Framework Convention on Climate Change
UCSP	Upington Concentrating Solar Power Plant
UCS	Use of Borrower/Country Systems



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## Overview

This Report presents the Panel's observations and findings on claims of Bank non-compliance with its operational policies and procedures, and associated harm, with respect to the *South Africa: Eskom Investment Support Project*. The Request for Inspection was submitted by representatives of community members living in the Project area through two South African non-governmental organizations. The Project includes a 4,800 MW coal-fired power plant near Lephalale in Waterberg District, Limpopo Province, and associated infrastructure and investments, as well as a component for the development of renewable energy generation sources. The World Bank loan amounts to US\$ 3.75 billion and was approved in April 2010. In carrying out its investigation, the Panel has been conscious of several important features of this Project.

Firstly, the Project, and in particular the Medupi Power Plant, has been viewed by many as controversial. Key aspects of the debate, in South Africa as well as internationally, relate to difficult political and technical choices with respect to energy generation in South Africa, and the use of coal in the context of climate change. The Panel notes the key importance of meeting South Africa's power needs, as well as policy provisions to address potentially negative impacts in support of sustainability and poverty reduction. The main focus of the investigation has been on alleged potential harm in the local impact area from Medupi and its associated activities, although the Panel also examined issues of harm raised in the Request relating to national and global impacts, in line with the relevant policy framework.

Secondly, the Project is implemented under the World Bank policy *Piloting the Use of Borrower/Country Systems* in lieu of the Bank's regular safeguard policies. This is the first Panel investigation of a project applying this policy. The investigation process entailed making a distinction between system level and project level analyses – i.e. between Management's analysis of South African country systems and those of the borrower, Eskom, pertaining to environmental and social safeguards, and Management's review of the safeguard documents prepared specifically for the Medupi Power Plant, and compliance with applicable policy requirements at the project level. The Panel's findings do not alter the overall conclusion that South African environmental and social safeguard systems are broadly equivalent to the objectives and operational principles of Borrower/Country Systems policy, but point towards gaps that were not identified or addressed.

Thirdly, the Medupi Power Plant was already under construction when the Bank was approached for financing consideration. This implies that the Bank had limited leverage and opportunity to influence project design. The purpose of the Bank's Country System analysis and project appraisal included examining for the Board whether the project as designed would comply with Bank operational policies. In this context, the Panel commends Management for addressing the need for additional technology to reduce sulfur dioxide emission, and for stimulating investment in renewable energy.

The Panel's findings, however, confirm that the Medupi Power Plant represents four major challenges with respect to potential project-induced harm: significant water consumption raising issues of both scarcity and pollution in the local area; emission of gases and particulates causing increased health problems in the local area; added burden on the limited institutional and financial capacity of local authorities that have to cope with rapid industrialization of the area, especially as related to public and social infrastructure and environmental management; and emissions of greenhouse gases by the Medupi Power Plant. The Panel focused its investigation on issues of compliance and harm of relevance to these challenges, and its findings are summarized in the Executive Summary and Table of Findings.



# Executive Summary

## Background

**The Request.** In April 2010 the Inspection Panel received a Request for Inspection (the “Request”) related to the South Africa: Eskom Investment Support Project (the “Project” or “EISP”). The Request was submitted by representatives of community members living in the Project area (the “Requesters”) through groundWork and Earthlife Africa, two non-governmental organizations based in South Africa. The Requesters claim that World Bank Management has not properly followed its operational policies and procedures in connection with the Project, and that such non-compliance will cause or contribute to significant harms to people and the environment.

**The Project.** The Project’s development objective is to support South Africa in enhancing its power supply and energy security in a sustainable and efficient manner for both its economic growth objectives and long-term carbon mitigation strategy. The Project includes the 4,800 MW Medupi coal-fired power plant at Lephalale (hereafter, “Medupi”) and associated infrastructure and investments, as well as a component for the development of renewable energy generation sources, the Majuba Rail project, and energy efficiency sector investments and technical assistance. The construction of Medupi had already commenced by the time the World Bank was approached for financing consideration. Eskom Holdings Limited is the Borrower of the loan and the Government of South Africa is the Guarantor.

**Key Claims Presented to the Panel.** The Request identifies harms that the Requesters believe would be caused by the Bank’s lack of compliance with its operational policies and procedures. The Request contains 13 claims on issues of potential material adverse effects that were linked to the Project and covered by provisions of Bank policy. These claims allege harm related to increased health problems, decreased water availability, exacerbation of the effects of climate change, and cultural and livelihoods changes.

According to the Request, these will arise from emission of particulates and greenhouse gases, water uses, expanded mining operations, land development and influx of labor, as well as strains on the national economy. In addition, the Request claims that the application of the Bank’s policy on Borrower/Country Systems is not warranted in the context of the Project, and that there has been inadequate attention to key issues of cumulative impacts and Project alternatives.

**Management Response.** Management believes that extensive due diligence has been carried out during the Project preparation process and that, through such due diligence, the requirements of Bank policies and procedures, including those applicable to the matters raised in the Request, have been met. Moreover, Management believes that the Requesters’ rights or interests have not been, nor will they be, directly and adversely affected.

## Investigation Framework

**Relevant Bank Policies.** This Report presents the results of the Panel’s investigation on each of the issues of harm raised in the Request for Inspection that relate to specific violations of Bank policy. The Panel’s investigation focused on whether the Bank complied with its own



policies and procedures in the design, appraisal, and implementation of the Project, and if instances of noncompliance were found, whether they caused, or were likely to cause, the harm or potential harm alleged by the Requesters and the people they represent. The main policy relevant to this investigation was OP/BP 4.00 on Piloting the Use of Borrower/Country Systems. Other relevant policies include OP 1.00 on Poverty Reduction, OMS 2.20 on Project Appraisal, OP/BP 10.00 on Investment Lending, OP/BP 10.04 on Economic Evaluation of Investment Operations, and OP/BP 13.05 on Supervision.

**Compliance Analysis at Two Levels.** The Panel notes that this is the first time the Inspection Panel has investigated a Project under the Bank's policy on Piloting the Use of Borrower/Country Systems, which relies on the country and borrower's legal and institutional frameworks. The Report notes in some length the development and importance of the country systems approach.

In accordance with this policy framework, the Panel's investigation focused its compliance analysis at two levels: the "System Level", which relates to Management's assessments of the "equivalence" and "acceptability" under Bank policy of the country and the borrower's environmental and social safeguard systems; and the "Project Level", which relates to Management's compliance with relevant provisions of OP/BP 4.00 as well as other Bank operational policies (non-safeguard policies) that apply to the Project directly.

**Investigation Outcomes.** The Panel notes the key importance of meeting South Africa's power needs, and the significance of having the Project carried out under the Bank's policy on Piloting the Use of Borrower/Country Systems. The Panel hopes that this investigation provides observations for corporate learning on how to deal with the considerable methodological and other challenges inherent in attaining compliance with this policy, and that it addresses issues of environmental and livelihoods impacts that require further attention and thus may contribute to improving the Project's overall development effectiveness.

**Questions not Investigated.** The Panel notes that the Request raises several overarching questions, on which there are divergent and hotly debated views. While the Panel has an explicit mandate to investigate whether the Bank complied with its operational policies and procedures with respect to this Project, it does not have a mandate to assess Board decisions or examine its judgment regarding the objectives of the Project to meet South Africa's energy needs. Nor can the Panel analyze whether the Project meets the requirements of Bank strategy documents such as *Development and Climate Change* (World Bank, 2008) as this is not an operational policy of the Bank.

### **Compliance Analysis at the System Level**

The Requesters question the adequacy of Management's application of OP/BP 4.00, citing inconsistencies between South African law and Bank safeguard policies and contend that the country has a "*problematic*" track record of enforcing the laws it has in place. The Panel examined whether Bank Management complied with the system level requirements of this policy, including in particular the requirements to assess the "equivalence" and "acceptability" of a country's and borrower's environmental and social safeguard system under its provisions.

**Assessment of Equivalence.** On the question of “equivalence”, the Panel reviewed Bank Management’s assessment, through its Safeguards Diagnostic Review (SDR), of whether the applicable legal and institutional framework in South Africa was designed to achieve the objectives and adhere to the applicable operational principles set out in Table A1 of OP 4.00. The Panel noted the comprehensive legal and institutional framework for environmental and social safeguards within South Africa, and found that aside from the shortcomings noted below, Bank Management generally did good quality work in developing the SDR for the Project as required by OP 4.00, especially given the complex nature of this task.

The SDR did not, however, adequately address certain gaps in the legal framework pertaining to analysis of cumulative impacts and environmental management planning that were present at the time that the Project was under development. Although the legislative framework had changed by the time the SDR was being carried out and addressed these gaps substantially, the SDR failed to notice that these gaps were reflected in environmental and social safeguard documents prepared for Medupi and accepted by the Bank. Also, the SDR failed adequately to address the lack of provision in South African law to use an Independent Advisory Panel for the Environmental Impact Assessment for this type of project, and did not provide an adequate analysis of equivalence in respect to laws related to water use and mining activities, which are of relevance to this Project and the claims of the Requesters.

In addition, the SDR identified a few additional “minor” ambiguities or gaps in the legal framework, but added that *“it would appear from the analysis of Eskom’s policies and procedures that all these gaps in the legal framework [...] are fully addressed and internalized in Eskom’s policies and practices”*, with the exception of some aspects of involuntary resettlement. The Panel noted the institutional strength of Eskom, but questioned this degree of reliance on self-regulation in determining equivalence.

**Assessment of Acceptability.** On the question of “acceptability”, the Panel examined Management’s assessment of the institutional practices, track record and capacity of the Borrower and the Country’s relevant institutions, as required by OP/BP 4.00. Of most importance in this regard, the Panel found that there was an inadequate assessment of the capacity and implementation practices in particular of provincial and local level government institutions responsible for regulatory oversight and monitoring and enforcing environmental and social standards. The SDR did not suggest feasible actions to address these important issues, other than essentially rely on the capacity, track record and expected self-regulation of Eskom. While acknowledging the Borrower’s institutional capabilities and track record, the Panel found that this was not a sufficient response under relevant policy.

The Panel also noted a concern in terms of the Bank’s reliance on the Medupi Environmental Impact Assessment (EIA) as an input for its SDR analysis. Having found the Borrower’s system acceptable at the system level, partially on this basis, Management’s ability to critique the same EIA objectively when it is the subject of appraisal at project level may be affected. The Panel’s analysis in fact shows that the Environmental Impact Report (EIR) prepared for Medupi, and accepted by Management, had certain shortcomings as compared with the relevant policy framework that were not identified or addressed.

**Non-compliance and Harm.** The Panel noted core elements of the country system in South African law, including its National Environmental Management Act (NEMA) principles, which correspond to, and in some cases may go beyond, the provisions of Bank policy

principles in safeguarding against issues of social and environmental harm. In the Panel's view, nonetheless there are instances of non-compliance by Management that are significant in the context of this Project. While they would not alter the overall conclusion that South African systems are broadly equivalent to the objectives and operational principles of OP/BP 4.00, they point towards gaps that were not identified and addressed. In addition, and of particular importance, the Panel observed that weakness in Management's analysis of the capacity of local government institutions to manage and monitor environmental harms may become a critical factor in terms of addressing/mitigating the local level harms raised in the Request and further outlined below. While the implications of these instances of non-compliance are difficult to predict, the Panel noted that the potential impacts of a project of the size and scale of EISP are significant, and the existence of adequate capacity to identify and address these impacts is likely to be a crucial factor in the Project's overall health, environment and development outcomes.

## **Compliance Analysis at the Project Level**

In its assessment of Management's compliance with Bank policies, the Panel focused on those claims related to the Project's impacts on air, water and climate as well as on other project-level claims of a social and economic nature, including the Project's impacts on local livelihoods and public infrastructure services. In addition, the Panel examined the two claims that relate to Project impacts at a national level, in terms of energy access by the poor and the national economy of South Africa.

The policy framework for social and environmental safeguard aspects at the project level is set forth in OP/BP 4.00, including Table A1, as applied through key elements of the borrower/country system adjudged to be equivalent, and any agreed-upon gap-filling measures. OP/BP 4.00 also provides that the Bank is responsible for appraising and supervising pilot projects that use country systems, and for confirming, as part of due diligence, that project environmental and social safeguard documents are acceptable to the Bank. Other relevant policies for the analysis at the Project level are OP 1.00 on Poverty Reduction, OMS 2.20 on Project Appraisal, OP 10.00 on Investment Lending, OP/BP 10.04 on Economic Evaluation of Investment Operations, and OP/BP 13.05 on Supervision.

What follows is a summary of the main points of analysis and findings of the Panel on each of the claims relating to non-compliance and harm at the Project level, organized on a claim-by-claim basis.

**Water Availability and Quality.** The Requesters fear that the Medupi Power Plant and its sulfur scrubbers for pollution abatement will put additional strain on existing water sources in an area already suffering from water scarcity. In addition, the Requesters claim that the directly related expansion of coal mining at the Grootegeluk Mine will have negative environmental impacts, especially with respect to acid mine drainage. These impacts on water resources are of particular importance given that the region is marked by water scarcity, and may result not only from the Project itself but also from the coal, water, and sand needed for the construction and/or operation of Medupi. The Panel was of the view that the additional scale of the water augmentation project that will supply water to Medupi, the expansion of the operations of the Grootegeluk Mine, and the additional river-bed sand excavation from the Mokolo River for Medupi are associated with the Project, which is important for the proper application of relevant Bank policy.

The Panel noted that the focus of Management in relation to water resources appears to have been on ensuring that Medupi had a reliable source of water supply. Insufficient attention was given in Project documents to the potential impacts that the use of water by the plant might have on other users, and to the evaluation of the potential significance of Project impacts on quantity and quality of surface and groundwater resources. The Panel also noted that Medupi is being constructed when the full spectrum of likely impacts on water resources has not been reliably identified or assessed.

In short, the Panel found that the inadequate consideration of the Project's direct, indirect and cumulative impacts on availability and quality of surface and ground water resources is not consistent with OP/BP 4.00. This is of particular concern in light of the scarcity of water resources in the region, the associated risks and the competing demands for those resources. The Panel further found that the Project's consideration of the impacts of Medupi on water resources was not based on a risk-averse approach, as required under the terms of OP/BP 4.00 and South Africa's national environmental management principles. The Panel found that these instances of non-compliance have likely weakened the ability of the Project to take effective steps to minimize or avoid these risks, and provide measures to compensate for harms that cannot be avoided.

The Panel noted that the expansion of the Grooteegeluk Mine to supply coal to Medupi will result in cumulative impacts of potential significance linked to increased water use on river systems, and on surface water and groundwater quality. The Panel's view was that Management should have taken a broader look at expansion of coal mining to supply Medupi, given that it entails associated and cumulative impacts of relevance and that the expansion of the Grooteegeluk Mine will increase water use and risks of water pollution, particularly with regard to acid mine drainage in the longer term. The Panel found that these cumulative impacts of the Project were not properly assessed, as required by OP 4.00.

**Emission of Particulates, Air Quality and Health Problems.** The Requesters claim that the expected emissions from the Medupi Power Plant will cause health impacts, and that local communities are seriously concerned about the potential impacts from emissions of sulfur dioxide, nitric oxide, heavy metals and particulates. The Requesters are concerned that Medupi will add to the background levels of these pollutants already emitted by the nearby Matimba coal-fired power plant, the Grooteegeluk Coal Mine, and other polluting activities such as brickworks in the Lephalale area and other planned industrial development in the vicinity.

The Panel found significant shortcomings in Management's due diligence assessment of air quality issues and the development of responsive mitigation measures to address risks of serious harm. This is not consistent with the provisions of OP/BP 4.00. In terms of cumulative impacts, the Panel found that an analysis of the cumulative effects of the Grooteegeluk mine, Medupi and Matimba on air quality in the local airshed was carried out as part of the related EIA and Environmental Management Program Report (EMPR), consistently with OP/BP 4.00, but that due consideration should have been given to probable future projects in the area (e.g. additional coal mines and coal-fired power stations) in determining the appropriate level of mitigation measures for the Project. The Panel considered that these shortcomings in policy compliance have important implications for residents in the vicinity of Medupi and in the

region, and likely reduced the ability of Management to assess and respond to the significant potential negative air quality impacts of Medupi in an integrated and effective manner

The Panel noted the important role of Management in ensuring the installation of technology to remove emission of SO<sub>2</sub> (i.e. flue gas desulphurization – FGD), though the planned installment of FGD is three years after start of the plant and may be further delayed in light of, *inter alia*, risks posed by water scarcity. The Panel also noted that Management is supporting a study of cumulative impacts in the context of a broader ongoing regional environmental and social assessment, with important potential to help manage cumulative impacts from prospective activities, though it does not have a direct bearing on mitigation measures currently planned for Medupi.

**Greenhouse Gas Emission and Exacerbation of Climate Change.** The Requesters raise concerns about the potential impacts of the Project on greenhouse gas (GHG) emissions from Medupi and thus on global climate change. They claim that the new coal-fired power plant will make it more difficult for South Africa to meet its GHG reduction commitments, and that the climate change impacts of the Project have not been adequately considered and addressed as required by Bank policy. The Panel noted that Bank operational policy does not contain explicit climate change targets, especially relating to GHG emissions, though it does set forth various requirements to identify and address potential adverse transboundary and global impacts of a project, including those relating to climate change. The Panel also noted that South Africa does not have a specific obligation to reduce GHG emissions under an international environmental agreement within the meaning of the relevant operational principle of OP 4.00. In this context, an issue of policy compliance by Management on this point does not arise.

The Panel examined whether Bank Management acted consistently with other relevant policy requirements on this matter, in light of the claims in the Request. In this context, the Panel examined whether the Project's assessment adequately considered and adopted technology and policy measures to control and mitigate GHG emissions in line with Bank Policy. The Panel found that steps have been taken to adhere to this policy framework, including for example the Majuba Rail project and other energy efficiency measures. The Panel noted, however, that the magnitude of emissions from Medupi far outweighs emissions avoided through Project mitigation measures, and found that the description of the net results of mitigation efforts under the Project failed to adequately demonstrate that the Project is directly addressing its own externalities. The Panel's related analysis of whether the Project adequately considered alternatives to coal is summarized below.

Finally, the Panel reviewed whether Management's assessment of Project documents accurately assessed the potential impacts and risks arising from the Project in respect to climate change, in light of Bank operational policies and in support of informed decision-making by the Board of Executive Directors. The Panel noted, in this regard, the statement by Management early in the PAD that “[T]he present project, as well as the longer-term partnership envisaged between the government of South Africa and the World Bank will enable the country to achieve a low carbon trajectory.” The Panel considers that this broad statement early in the PAD may convey an overly optimistic view of the Project on this matter, given that Medupi will emit significant levels of GHG emissions.

**Influx of Laborers, Land Development and Local Impacts.** The Requesters claim that the Project will have adverse effects on local communities and overwhelm local services due to the influx of people and workers for the construction of the plant, and add to the effects of other new activities and development linked to Medupi. The Panel considered that the issue of impacts of Medupi on the local municipality and public services for which the Municipality is responsible is serious, and potentially detrimental to the rights and interests of the Requesters. As indicated in the Medupi EIA, substantial new investments will be needed in access roads, water, sanitation, housing, health care and schools. Similarly, the EMPR for the expansion of the Grooteegeluk Mine notes the anticipated pressure on local services due to incoming workers at the mine. During its field visits, the Panel saw indications of serious stress upon local infrastructure services, including water and sewage systems, and heard many related concerns including those about security and spread of diseases – HIV/AIDS in particular.

Although these issues were identified by Management, the Panel found that the Medupi EIA accepted by the Bank did not include adequate mitigatory measures commensurate with its conclusion that impacts on public infrastructure and services were of “*high significance*”, as required by OP/BP 4.00 and relevant NEMA principles. Rather, there was a reliance largely on consultation with local authorities to find workable solutions. Furthermore, the cumulative impacts of both Medupi and expansion of the Grooteegeluk Mine on public infrastructure services were not addressed. The Panel found that Management’s acceptance of the Medupi EIA with these shortcomings was not consistent with OP/BP 4.00.

**Cross-Cutting Issue -- Inadequate Analysis of Project Externalities.** In carrying out its compliance analysis on the above project level issues, the Panel identified that the economic analysis of the Project prepared by the Bank did not adequately address the environmental and health-related externalities of Medupi. The Panel notes that the analysis included CO<sub>2</sub> emissions as a global externality and certain opportunity costs of water use by Medupi. Comparable attention, however, was not paid to other important externalities, such as the economic estimates of the costs of potential harm from air quality degradation in the Medupi area and of the anticipated increase in water scarcity in an already stressed water system incorporating the additional water requirements for expansion of the operations of the Grooteegeluk mine. The Project economic analysis should have explicitly addressed and estimated the costs of potential damages to human health and to animal habitat from increased SO<sub>2</sub> emissions in periods without FGD in place.

**Impacts on Local Livelihoods and Poverty.** The Requesters claim that Medupi will have detrimental impacts on the livelihoods of people living in and around Lephalale because the industrial activity and pollution will negatively affect agriculture, livestock rearing, and ecotourism. The Panel noted and commended the various efforts to enhance recruitment of people resident in the area as well as supporting Lephalale municipality in the rehabilitation and upgrading of public infrastructure, but noted that such actions and commitments were not derived from Management’s assessment of impacts. Rather, they required commensurate mitigatory measures in line with South Africa’s NEMA principles, which include a “polluter pays” approach and require environmental justice and special attention to vulnerable parties.

The Panel found that links between Medupi and issues of poverty in the impact area of the power plant were not addressed in the Project’s PAD, and featured only indirectly in the Medupi EIA accepted by Management. Social and livelihoods impacts are dealt with in the PAD primarily in terms of resettlement, and these documents are largely silent on other

socioeconomic impacts and their mitigation or compensation in the Lephalale area. The Panel considers that Management did not adequately consider issues relating to poverty reduction at the local level in Lephalale in its appraisal of the Project, which is not consistent with the spirit of OP 1.00 to “*increase opportunity*” and “*enhance empowerment*” and “*strengthen security*”. Properly addressing these issues might have resulted in a more proactive approach towards conditions that affect or benefit the livelihoods of the poor and vulnerable. The Panel notes that the Waterberg District is among the most disadvantaged areas in South Africa with high levels of poverty.

**Impacts on Cultural Heritage and Practices.** The Requesters claim that cultural practices in the area could be negatively impacted by the destruction of grave sites during construction of the Medupi plant, and by changes in the availability of sources of traditional medicinal plants as a result of the Project. The Panel noted that grave sites were identified and addressed in the Medupi EIR as part of the heritage study, that Eskom has made good-faith efforts to identify any grave sites that may be affected by the construction, and that the Bank was assured that if any oversight had been made, Eskom would respond to any grievances in accordance with the provisions of the South African National Heritage Resources Act.

The Panel also found that potential impacts on the availability of plants were not raised or assessed in the EIR accepted by Management, which mentions only that the establishment of construction camps may lead to degradation of surrounding natural areas in part through collection of medicinal plants, suggesting that there are such plants of value being collected in the local area. The consequences of this oversight in terms of access to medicinal plants, however, are likely to be less significant given the distance of the Medupi site from human settlements and the availability of similar habitats in the area.

**Impacts on Energy Access by the Poor.** The Requesters claim that the Bank provides no evidence for its argument that the Project will enable Eskom to provide electricity to the 20% of South African population that presently has no access to electricity, and that the Project will mainly benefit large industries. The Panel noted that the Project does not have as a direct objective the increase of electricity access by the poor, which is a matter of price and expanding distribution. The Panel notes that this Project is unlikely to diminish electricity access to the poor, and may enhance access by adding more electricity to the national grid. The Panel did not find an issue of compliance with Bank policy with respect to this claim.

**Impacts on the National Economy of South Africa.** The Requesters claim that repayment of the Bank loan will require more exports and higher tariffs to compensate for any future currency devaluation, noting that South Africa regularly experiences currency crashes. The Panel however was of the view that a loan of US\$ 3.75 billion phased over the remaining construction period of the Project, to be repaid over 25 years including a 10-year grace period, is unlikely to have any sustained impact on the exchange rate, and that the foreign source of the loan should not have any significant bearing on its implications for the exchange rate. The Panel did not find an issue of compliance with Bank policy with respect to this claim.

**Inadequate Consideration of Alternatives.** The Requesters claim that the World Bank did not adequately consider alternatives to coal. The Panel noted that the policy requirement to ensure that there is a complete and balanced review of design alternatives – a cornerstone of good EIA practice – was considerably more difficult in the present case, given that Eskom had already begun construction of Medupi before the Bank agreed to provide financial

assistance, that an analysis of alternatives had already been carried out by the Borrower, and that a project alternative had been selected for implementation. While the Bank could, and in some instances did, have an influence on alternative designs of certain project features such as those to ameliorate air pollution, for most types of design alternatives the decisions had already been made and could not be reversed.

The Panel found that Management acted consistently with Bank policy in including an extensive analysis in the PAD on the issue of viable alternatives to the Project to reduce GHG emissions in light of Project objectives, which was additional to the information provided in the Medupi EIR. However, it noted that this analysis focused only on electricity production cost and the externality of GHG emissions, whereas Bank policy, and corresponding provisions of South African law, requires a broader focus on whether there are other feasible alternatives available that could meet project objectives and reduce or avoid significant externalities and impacts. Overall, the Panel found that Management did not ensure that Project documentation adequately included a complete and balanced review of design alternatives to promote informed Board decision-making. The Panel further found that, since the economic analysis did not adequately consider all relevant externalities (in particular with regard to water and air), there was an inadequate consideration of risks in the analysis of alternatives, which is not in non-compliance with OMS 2.20. In addition, the Panel noted that the figures used in the PAD on the costs of CO<sub>2</sub>, though well accepted at the time, may have under-estimated these costs, a concern that becomes greater when emissions are looked at in a cumulative context and in light of the long-term nature of the relevant investments.

## **Systemic Issues and Contributions to Corporate Learning**

The Panel's investigation revealed systemic issues relevant to Bank compliance in the context of this Project. As a contribution to corporate learning, the Report discusses three sets of systemic issues: the Bank's policy on Borrower/Country systems; policy compliance in relation to associated activities; and assessing impacts on water resources.

## **Panel Findings**

The complete Panel findings are presented in the Table of Findings below.



## Table of Findings

ISSUE	PANEL'S FINDINGS
<p><b>Assessment of Equivalence</b></p> <p><b>Claim:</b> proposals to fill “gaps” do not include changes to South African laws and regulations, but reflect only changes that should be made at Eskom with this specific project, and do not appear to be mandatory, long-term improvements to Eskom’s “system.”</p> <p><b>Management Response:</b> following the due diligence undertaken by Bank staff as mandated by OP 4.00, the gaps and ambiguities identified in both the South African legal framework and in Eskom’s policies for which Eskom could be held accountable by its stakeholders, were appropriately filled through measures agreed and implemented prior to Project appraisal.</p>	<p><b>Compliance Analysis at the System Level</b></p>
	<p><b>General Conclusions</b> The Panel notes that the preparation of an SDR is a challenging and complex task and recognizes the significant work by staff to carry out this assignment. The SDR contains a detailed review of the Guarantor’s and the Borrower’s legal and regulatory framework and practices. The Panel finds that, in most respects, Management’s analysis of equivalence complies with OP/BP 4.00. The Panel, however, found certain shortcomings in the SDR analysis, which raise issues of compliance as they relate to the claims in the Request.</p> <p><b>Shortcomings in the Analysis of Equivalence</b></p> <p><b>Relevant Legal Framework.</b> The Panel finds that the SDR did not adequately recognize the gap between Bank Policy requirements and prevailing national legislation with respect to assessing cumulative impacts and environmental management planning in the EIA process at the time that the Medupi EIA was prepared, as required by Table A1 of OP/BP 4.00.</p> <p><b>Assessment of Applicable Laws.</b> The Panel finds that the SDR does not provide an adequate analysis of equivalence in respect to laws related to water use and mining activities which are of relevance to this Project and the claims of the Requesters. The Panel further finds that the SDR does not adequately assess the lack of provision in South African law to use an independent advisory panel during preparation and implementation of projects that are “<i>highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns,</i>” which is an operational principle set forth in Table A1 of OP 4.00 (para. A.8). In these respects, the SDR analysis falls short of the requirements of OP/BP 4.00.</p>
<p><b>Assessment of Acceptability</b></p> <p><b>Claim:</b> Bank’s analysis that South African institutions can adequately monitor and implement national laws and protect peoples’ health and well-being is incorrect; South Africa has a problematic track record of actually abiding by and implementing its environmental and social obligations.</p> <p><b>Management Response:</b> enforcement of environmental and social laws in South Africa is challenging. However, Eskom has a strong record of compliance with safeguards. Bank safeguard staff who visited the Medupi site on several occasions during construction have met with the ECO and confirmed the EMC’s active engagement in monitoring compliance with the environmental and social conditions applicable to the project and DEA has substantially expanded its enforcement capacity.</p>	<p><b>Assessment of Institutional Capacity</b> The Panel finds that the analysis of acceptability in the SDR did not adequately address the institutional capacity of key regulatory institutions involved in environmental monitoring and management related to EISP, particularly at the provincial and local levels. The focus was mostly on Eskom and DEAT. This does not comply with OP/BP 4.00.</p> <p><b>Implementation Practices and the Project EIA</b> The Panel finds that the SDR does not adequately reflect concerns relating to implementation practices and track record in regard to the EIA process, nor suggest feasible actions to address them, other than relying essentially on the capacity and practices of the Borrower. This is not consistent with OP/BP 4.00.</p> <p><b>Gap Filling</b> Due to certain shortcomings in its analysis of institutional capacity and implementation practices, the Panel finds that Management did not have an adequate basis to properly identify gap-filling measures to help address issues of capacity within competent environmental authorities at certain tiers of government to, inter alia, review EIAs, draft robust authorizations, and monitor and enforce compliance. This is not consistent with OP 4.00.</p>

## Compliance Analysis at the Project Level

### Decreased Water Availability and Quality

**Claim:** Project creates risks of harm to both water availability and quality, due to the consumptive use of water by Medupi and risks of water contamination as a result of its construction and operation.

**Management Response:** Medupi's water needs, as well as those of an expanded Grootegeluk Mine, will be met by the Department of Water Affairs (DWA) through the implementation of the first two phases of the Mokolo-Crocodile (West) Water Augmentation Project (MCWAP), designed to meet the 25-year planning horizon that anticipates high and growing demand for water for public supply, irrigation, and industrial use in the Steenbokpan-Lephalale corridor in which Medupi is located.

### Emission of particulates, air quality and health impacts

**Claim:** expected "significant" emissions from the coal-fired Medupi Power Plant will cause health impacts, because of emissions of sulfur dioxide (SO<sub>2</sub>), nitric oxide (NO<sub>x</sub>), heavy metals (e.g. mercury) and particulates that Medupi, once operational, will add to the background levels of these pollutants.

**Management Response:** there will be no significant incremental impact of air emissions from the Medupi Power Plant on human health from particulate matter, mercury and other heavy metal emissions, and sulfur dioxide, and that the human health risks of not immediately installing abatement technology are acceptable.

The Panel finds that there has been inadequate consideration of the Project's direct, indirect and cumulative impacts on availability and quality of surface and ground water resources. This is not consistent with OP/BP 4.00.

This shortcoming is of particular concern due to the scarcity of water resources in the region, the associated risks and in light of competing demands for those resources. The construction and operation of the Medupi plant entails significant risks of adverse impacts on the availability and quality of surface and ground water resources in the area. The Panel finds that the instances of non-compliance noted above have likely weakened the ability of the Project to take effective steps to minimize or avoid these risks, and provide measures to compensate for harms that cannot be avoided.

The Panel finds that the Project's consideration of the impacts of Medupi on water resources was not based on a risk-averse approach, as required under the terms of OP/BP 4.00 and the NEMA s2 principles. Such an approach is not evident in the PAD or the Medupi EIR, the SDR, or the MCWAP documentation accepted by Management.

The Panel's view is that Management should have taken a broader look at expansion of coal mining to supply the Medupi Power Plant, given that it entails associated and cumulative impacts of relevance and that the expansion of the Grootegeluk Mine will increase water use and risks of water pollution, particularly with regard to Acid Mine Drainage in the longer term. The Panel finds that this is a combined cumulative impact of the Project that was not properly assessed, as required by OP 4.00.

The Panel finds significant shortcomings in Management's due diligence assessment of air quality issues and of the development of responsive mitigation measures to address risks of serious harm. This is not consistent with the provisions of OP/BP 4.00.

The Panel further finds that an analysis of the cumulative effects of the Grootegeluk mine, Medupi and Matimba on air quality in the local airshed was carried out as part of the related EIA and EMPR for expansion of the Grootegeluk Mine. The Panel finds that this is largely consistent with OP/BP 4.00. However, the Panel is of the view that due consideration should have been given to probable future projects in the area (e.g. additional coal mines and coal-fired power stations), in determining the appropriate level of mitigation measures for the project.

The Panel finds that it is likely that these shortcomings in meeting relevant policy requirements have reduced the ability of the Project to assess and respond to the significant potential negative air quality impacts of Medupi in an integrated and effective manner.

The Panel notes that Management is supporting a study of cumulative impacts in the context of a broader Regional Environmental and Social Assessment which is ongoing. The Panel notes the importance of these initiatives and their potential to help manage cumulative impacts at a regional scale.

**Greenhouse gas emissions and Exacerbation of climate change**

**Claim:** potential impacts of the Project on the global problem of climate change, due to large-scale greenhouse gas emissions from the Medupi coal-fired power plant financed under the Project. Impacts not adequately considered.

**Management Response:** GoSA's commitment to climate change mitigation is signaled by a number of national and international commitments to pursue a low carbon growth path EISP allows South Africa to meet its urgent energy security needs through the 4,800 MW Medupi Power Plant and at the same time "supports interventions to mitigate climate change

**Technology and policy measures to control and mitigate emissions.** The Panel finds that steps have been taken to adhere to the Bank's policy framework, including selection by Eskom of super-critical technology, financing of the Majuba Rail Project, and financing of renewables as part of the Project. The Panel considers that these efforts constitute an important recognition of other options available to provide electricity and reduce negative externalities in the context of the critical need for power to support development in South Africa. Nevertheless, the magnitude of emissions from Medupi far outweighs emissions avoided in these measures. The Panel notes that the description of the net results of mitigation efforts under the Project fails to demonstrate adequately that the Project is directly addressing its own externalities.

**Alternatives to the Project to reduce GHG emissions.** The Panel finds that Management acted consistently with Bank policy in preparing an extensive analysis in the PAD on the issue of GHG externalities, and notes that this analysis is additional to the information provided in the Medupi EIR. The Panel notes, however, that this is not a complete analysis of alternatives, as it focuses only on electricity production cost and the externality of GHG emissions. The Panel notes that Bank policy, and corresponding provisions of South African law, does not focus narrowly on "least cost", as referred to in the PAD, but on whether there are other *feasible* alternatives available that could meet project objectives and reduce or avoid significant externalities and impacts.

**Influx of laborers, land development and local impacts**

**Claim:** concerns about social and environmental effects of labor migration to the area in relation to the Medupi project.

**Management Response:** the expanded workforce will put pressure on housing and municipal infrastructure and services, and that increases in sexually transmitted diseases and social conflict can occur but amended EMPR contains measures to address these impacts

The Panel's assessment is that the issue of impacts of the Medupi Power Plant on the local municipality and public services for which the Municipality is responsible is serious, and potentially detrimental to the rights and interests of the Requesters. The Panel finds that the EIA accepted by Management did not adequately identify mitigatory measures commensurate with its conclusion of impacts of "*high significance*" on public infrastructure and services, as required by OP/BP 4.00 and relevant NEMA principles. Management's acceptance of the EIA with this shortcoming is not consistent with OP/BP 4.00.

#### **Impacts on local livelihoods and poverty**

**Claim:** Medupi Power Plant will have “detrimental” impacts on the livelihoods of people living in and around Lephalale because the industrial activity and pollution will negatively affect agriculture, livestock rearing, and ecotourism.

**Management Response:** none of the issues the Requesters raise related to livelihoods can be considered potential detrimental impacts. Environmental Impact Report (EIR) for EISP “adequately” identifies and addresses the impacts of the Medupi Power Plant on livelihoods and that Management is confident that mitigation measures are in place to avoid or minimize such impacts.

#### **Cross-cutting Issues: Analysis of Project Externalities**

#### **Impacts on cultural heritage and practices**

**Claim:** cultural practices in the area could be negatively impacted by the “destruction” of grave sites during construction of the Medupi plant and changes in the availability of sources of traditional medicinal plants as a result of the Project.

**Management Response:** the conservation of cultural resources

**Commercial Farming and Ecotourism** The Panel finds that the assessment of possible impacts on tourism in the EIR accepted by Management is not comprehensive and certain conclusions are not backed by empirical analysis. In this sense, the Panel finds that Management’s assessment of these aspects of the EIR is not fully consistent with OP 4.00, Table A1’s requirement that the country system should call for “*appropriate studies [to be] undertaken proportional to potential risks and to direct, and as relevant, indirect, cumulative, and associated impacts.*” On the other hand, the Panel notes that though the Medupi investment will contribute to further urbanization and a change of the sense of place, the net effect of this factor on ecotourism and commercial agriculture is difficult to predict.

**Local Poverty Reduction** The Panel finds that links between the Medupi Power Plant and issues of poverty in the impact area of the plant are not addressed in the Project’s PAD or SDR, and feature only indirectly in the EIR accepted by Management. Social and livelihoods impacts are dealt with in the PAD and SDR primarily in terms of resettlement. These documents are largely silent on other socioeconomic impacts and their mitigation or compensation in the Lephalale area. This is not consistent with provisions on poverty reduction of OP 10.00. Properly addressing this issue might have resulted in a more proactive approach to address conditions that affect or benefit the livelihoods of poor and vulnerable communities.

**Air Quality** The Panel considers that the economic analysis should and could have included calculations of potential harm from air quality degradation in the area of the Medupi Power Plant. Thus, the Panel finds the economic analysis to be non-compliant with OMS 2.20 and OP 10.04.

**Water Resources** The Panel finds that the failure to cost the 2 Mm3 of water per year required for expansion of the Grootegeeluk Mine does not comply with OMS 2.20 requirement that economic evaluations identify, quantify and value all costs and benefits likely to be involved in the project. The Panel also finds that the approach to analyzing risks in the economic analysis is consistent with OP 10.04.

**Economic Analysis of Alternatives** The Panel determined that the economic analysis contains an inadequate consideration of risks --in particular, with regard to water and air externalities--associated with the choice of alternatives. The economic analysis includes extensive testing of the sensitivity of the choice of alternatives to CO<sub>2</sub> values but does not test for the sensitivity of alternatives to domestic and transboundary externalities associated with water availability and quality nor air quality degradation. The Panel finds that this omission constitutes non-compliance with OMS 2.20. As a result, the Board did not receive important information for decision-making.

**Grave sites** The Panel notes that grave sites were identified and addressed in the Medupi EIR as part of the heritage study. Furthermore, it is the Panel’s assessment that Eskom has made good-faith efforts to identify any grave sites that may be affected by the construction. The Bank has been assured that if any oversight has been made, Eskom would respond to any grievances in accordance with the provisions of the South African National Heritage Resources Act.



is a key issue treated in the Record of Decision (RoD) for the EISP and that it is satisfied South Africa has the necessary regulations and Eskom the institutional capacity to implement the Project while conserving the natural habitat and physical cultural resources in the area. The plant communities on the Project site were found to be characteristic of the surrounding bushveld, and that clearing of the site would not significantly reduce the availability of plants with medicinal uses associated with cultural practices in the area.

#### **Impacts on Energy Access for the Poor**

**Claim:** Bank provides no evidence for its argument that the Project will enable Eskom to provide electricity to the 20% of South African population that presently has no access to electricity. Project will mainly benefit large industries.

**Management Response:** South Africa and Eskom have increased overall access to electricity from 34% to 81% since 1994 and though the Project does not finance new connections, the Government has made provision for connecting the remaining 19% of households, the majority of whom are poor, by 2014.

#### **Impacts on the National Economy**

**Claim:** repayment of the World Bank will require more exports and higher tariffs to compensate for any future currency devaluation.

**Management Response:** the loan will not put undue stress on the country's foreign exchange situation because the payment on the principal amount will be no more than 0.1% of the country's total exports in any given year the IBRD loan is the cheapest and longest-maturity loan available to Eskom from any financial source, totaling 9% of Eskom's total

The Panel notes that this Project is unlikely to diminish electricity access to the poor, and may enhance access by adding more electricity to the national grid. The Panel did not find an issue of compliance with Bank policy with respect to this claim.

A loan of US\$ 3.75 billion phased over Project implementation, and to be repaid in 25 years including a 10 year grace period, is unlikely to have any sustained impact on the exchange rate. The Panel did not find an issue of compliance with Bank policy with respect to this claim.

liability when the Project is commissioned in 2012	
<p><b>Inadequate consideration of alternatives</b></p> <p><b>Claim:</b> the Project did not adequately consider "alternatives to coal."</p> <p><b>Management Response</b> there are no immediate domestic alternatives to coal for ensuring electricity supply, because Coal is the major and only low-cost source for power generation.</p>	<p><b>Alternatives to coal</b> The Panel notes that no systematic comparative analyses of emission abatement options and associated impacts, including infrastructure or services required to provide the required materials and manage and dispose of wastes, were undertaken to inform the choice of wet FGD. The Panel finds that the absence of such an analysis is inconsistent with the requirements of OP/BP 4.00 that appropriate studies be undertaken proportional to potential risks. This is also out of keeping with the requirements of OP/BP 4.00 and OMS 2.20 that feasible or worthwhile alternatives be assessed in a manner that would allow identification of the "best practicable environmental option" or optimal option, and/or enable the findings of that assessment to influence decision making on the project design and its implementation.</p> <p>The Panel commends the initiatives by Management to carry out an additional GHG analysis, provide support for the renewable energy and other energy efficiency components, but finds that Management did not ensure that Project documentation adequately considered feasible alternatives, as required by Bank policy, to promote informed decision-making by the Board.</p>



# Chapter 1: Request for Inspection, Management Response and the Investigation Process

## A. Organization of the Report

1. This report presents the analysis and findings of the Inspection Panel on issues raised by the Request for Inspection relating to the South Africa: Eskom Investment Support Project (hereinafter the “Project” or “EISP”), submitted on April 6, 2010, by groundWork and Earthlife Africa, two non-governmental organizations in South Africa, acting as representatives of community members living in the project area in Lephalale in Limpopo province (the “Request”). As described below, the Requesters have a number of concerns about the negative impacts of the Project and its associated infrastructure, which include a 4,800 MW coal-fired power plant and other investments. They claim that these harms result from noncompliance by the Bank with its operational policies and procedures. In line with its mandate, the Panel’s investigation focuses solely on the issues raised by the Request that relate to allegations of violations of the World Bank’s operational policies and procedures, and related harm, linked to the Project.
2. The report has six Chapters. This introductory Chapter describes the Project, summarizes the claims of the Requesters and the response of Bank Management to these claims, and describes the Panel’s investigation process and design. Chapter 2 describes the context within which the Project is taking place, including in respect to social and environmental issues and energy development, and a brief description of Bank policies relevant to the investigation. It also provides an overview of Bank policy OP/BP 4.00 (Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects, hereinafter ‘Use of Borrower/Country Systems’ or “UCS”)<sup>2</sup>, which has been applied to the Project, and the Panel’s role in assessing compliance with this policy.<sup>3</sup>
3. Chapter 3 presents the Panel’s findings on issues of compliance at the system level<sup>4</sup> under OP/BP 4.00, while Chapters 4 and 5 present the Panel’s findings on compliance

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<sup>2</sup> World Bank, 2005a. See also World Bank, 2005b, Expanding the Use of Country Systems in Bank-Supported Projects: Issues and Proposals, Operations Policy and Country Services, March 4. World Bank operational policies can be accessed online at <http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL/0..menuPK:64701637~pagePK:51628525~piPK:64857279~theSitePK:502184.00.html>

<sup>3</sup> The policy is elaborated in OP 4.00 on Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects (World Bank, 2005a) and World Bank, 2005b. As provided by OP 4.00 (footnote 3), the relevant legal framework is not necessarily limited to that of the “Borrower” (when not a Member Country), and is defined as follows: “‘country systems’ means a country’s legal and institutional framework, consisting of its national, sub-national, or sectoral implementing institutions and applicable laws, regulations, rules, and procedures.” The present Report also refers to this policy as “Borrower/Country Systems” to reflect this approach.

<sup>4</sup> The “system-level” analysis under OP/BP 4.00 refers, principally, to the analysis of whether Bank Management properly fulfilled the requirements of this policy to assess the equivalence and acceptability of the borrower country’s systems vis-à-vis Bank policy, and to identify and address any gaps between the two normative frameworks.



and related harm at the project level<sup>5</sup> under OP/BP 4.00 as well as under other Bank operational policies and procedures applicable to the Project. Chapter 6 concludes with observations on systemic issues arising from the Panel's examination of compliance and allegations of harm.

## B. Description of the Project

4. The Project Appraisal Document (the "PAD") states that EISP seeks to support the poverty alleviation and economic growth efforts of the Government of South Africa (hereinafter GoSA or "the Guarantor") by providing financing to Eskom Holdings Limited (hereinafter referred to as Eskom or "the Borrower"), a state-owned enterprise<sup>6</sup>, to enhance national power supply and assist GoSA to meet the country's energy needs (PAD: para. 62 and 152). The Project also seeks to support the Government's efforts to mitigate the effects of climate change by providing concessional financing under the Clean Technology Fund (CTF) for renewable energy projects.<sup>7</sup>
5. According to the Loan Agreement, the Project objective is "*to enable the Borrower to enhance its power supply and energy security in an efficient and sustainable manner so as to support both economic growth objectives and the long-term carbon mitigation strategy of the Guarantor.*"<sup>8</sup>
6. World Bank Management explains that because South Africa is the dominant regional economic power, the country's economic growth has a spillover effect on other countries in Sub-Saharan Africa (SSA). South Africa accounts for nearly two-thirds of SSA's gross domestic product (GDP). Its economy grew solidly from 1994 to 2007, with GDP in 2008 being 62% higher than in 1994. During this time, South Africa increased its population's access to electricity from 34% to 81% but its energy-intensive economy and high GDP growth also led to approximately 40% rise in the demand for electricity that was not matched by an increase in supply. Peak demand quickly depleted South Africa's energy reserves, and without any new generating capacity installed since the year 2000, the country experienced severe power shortages in 2007/08. These blackouts, coupled with the global financial crises, resulted in the country's first recession in 17 years.<sup>9</sup>

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<sup>5</sup> The "project-level" analysis refers to the analysis of whether Bank Management properly fulfilled requirements in respect to the project under OP/BP 4.00 and other applicable Bank operational policies and procedures, including OP/BP 10.04, OMS 2.20, OP/BP 10.00 and OP/BP 13.05 during Project design, appraisal, and implementation.

<sup>6</sup> In 2002 Eskom was converted into a public company pursuant to the Eskom Conversion Act, 13 of 2001 and as such the legislative framework applicable to any corporate entity in South Africa is applicable to Eskom.

<sup>7</sup> According to the project appraisal document, the "*Project, as well as the longer-term partnership envisaged between the Government of South Africa and the World Bank, will enable the country to achieve a low carbon trajectory.*" See para. 3 of "Project Appraisal Document on a Proposed IBRD Loan in the Amount of US\$ 3,750 million to Eskom Holdings Limited, Guaranteed by the Republic of South Africa for the 'Eskom Investment Support Project,'" Report No. 53425-ZA, March 19, 2010 (World Bank, 2010a; hereinafter referred to as PAD).

<sup>8</sup> See p. 6, Schedule 1, of "Loan Agreement (ESKOM Investment Support Project) between International Bank for Reconstruction and Development and Eskom Holdings Limited, dated April 16, 2010" (World Bank, 2010b; hereinafter referred to as Loan Agreement or LA).

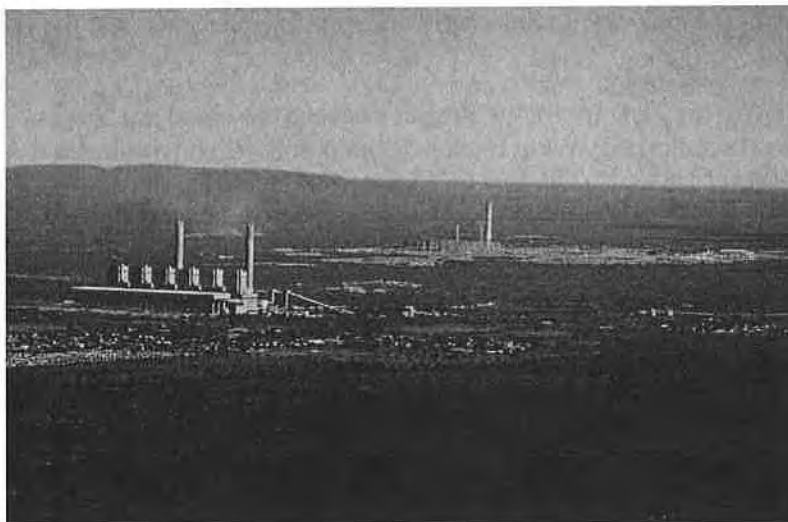
<sup>9</sup> See para. 9 of "Management Response to Request for Inspection Panel Review of the Republic of South Africa Eskom Investment Support Project (IBRD Loan No. 78620)" (World Bank, 2010c; hereinafter referred to as Management Response or MR).

7. According to Bank Management, since Eskom also generates more than 60% of the electricity produced in SSA, the power crisis of 2007/08 had a severe negative effect on neighboring countries as well. It was at this juncture, when the Medupi Power Plant was already under construction and its financing needs could not be met by international or domestic markets, that the Government of South Africa approached the Bank in its role as “*lender of last resort*” (MR: para. 8).
8. The Project objectives are to be achieved through three components to be implemented by Eskom (MR: Schedule 1, pp. 6-7):
  - **Component A: 4,800 megawatt (MW) Medupi Power Plant and associated transmission system (US\$3.04 billion IBRD).** This component supports: (a) Construction and commissioning of the Medupi Power Plant located at Eenzaamheid, Waterberg District, Lephalale Municipality in Limpopo Province, approximately 5 km southwest of the existing Matimba Power Plant;<sup>10</sup> and (b) Construction, supply, and installation of approximately 2,244 km of 400kV/765 kV transmission lines and five associated substations. The Medupi Power Plant is a mine-mouth, six-unit base-load coal-fired power plant using super-critical technology.<sup>11</sup> The PAD states that these six units will be dry cooled and will be designed to accommodate flue gas desulfurization (FGD) technology to control sulfur emissions (PAD: para. 193). This component of the Project will include the construction of access roads, emissions control systems, coal conveyor, ash conveyor and disposal infrastructure, and development of a water treatment plant which will include construction of a water pipeline along the ash conveyor.
  - **Component B: Investments in renewable energy projects (US\$260 million IBRD).** This component supports (a) installation and commissioning of the 100 MW Sere Wind Power Project in the Northern Cape Province, including turbines, associated infrastructure, roads (improvement and construction), and transmission lines and substations; and (b) construction of the 100 MW Upington Concentrating Solar Power Project (UCSP) in Northern Cape Province, with associated transmission lines.
  - **Component C: Low carbon energy efficiency investment and technical assistance (US\$440.77 million IBRD).** This component supports (a) construction of the Majuba Rail and Transmission Project in Mpumalanga Province, providing a railway line transporting coal from Ermelo to the existing Majuba power station; (b) provision of technical advisory services to improve efficiencies in Eskom’s current suite of coal-fired power stations; and (c) provision of technical advisory services for domestic and cross-border renewable and energy efficiency projects.

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<sup>10</sup> According to the PAD (p. 33), Matimba is a coal-fired power plant currently operated by Eskom.

<sup>11</sup> PAD: Annex 4, para. 4, describes “super-critical” as “*pulverized fuel (PF) technology, where coal is first pulverized, and then blown into a furnace where it is combusted at high temperatures. The resulting heat is used to raise steam, which drives a steam turbine and generator. The proposed super-critical combustion will result in the new power station’s thermal efficiency being up to 37.5 percent (compared to approximately 34 percent for older power stations), resulting in a reduced environmental impact as less coal will be burnt to produce the same amount of energy.*”



Picture 1: Matimba Power Plant and under-construction Medupi Power Plant (background)

9. The loan was approved by the IBRD Board of Executive Directors on April 8, 2010 and became effective on May 31, 2010. The expected loan closing date is October 31, 2015.<sup>12</sup> The total Project cost is US\$ 13.86 billion for which IBRD is providing a US\$ 3.75 billion loan. The loan will provide up to US\$ 400 million of retroactive financing of Project expenditures after January, 2007.<sup>13</sup> Co-financiers of the Project include the European Investment Bank, the African Development Bank,<sup>14</sup> other bilateral and commercial lenders, and the Clean Technology Fund.<sup>15</sup>
10. The Request for Inspection was received before Board approval of the loan and no disbursement had been made at the time. The Project has, as of the date of this report disbursed approximately US\$ 542 million. It may be noted that the Independent Review Mechanism (IRM) of the African Development Bank (AfDB) has received a request from affected people to investigate the Medupi Power Project that is similar, in many respects, to the Request submitted to the Inspection Panel. The Inspection Panel and the AfDB IRM recently signed a Memorandum of Cooperation to promote efficiency in

<sup>12</sup> Management states that the Medupi power plant is behind schedule due to various contractual issues. See Aide Memoire, South Africa: Eskom Investment Support Project (P116410) and Eskom Renewable Support Project (P122329), Project Supervision and Technical Discussions Mission, September 1, 2011.

<sup>13</sup> The loan also provides for US\$ 9.375 million to finance the front end fee associated with the IBRD Loan as requested by Eskom Holdings (PAD: paras. 88 and 92)

<sup>14</sup> The African Development Bank's (AfDB) Compliance Review and Mediation Unit (CRMU) received a request on September 28<sup>th</sup>, 2010 to review possible violations of the AfDB's policies and procedures with regard to the Medupi Power Project. The AfDB Board of Directors approved a compliance review of the climate change, environment, and social issues raised in the Request on July 15, 2011. For more information, see CRMU website at [www.afdb.org/irm](http://www.afdb.org/irm).

<sup>15</sup> The Clean Technology Fund (CTF), one of two Climate Investment Funds, promotes scaled-up financing for demonstration, deployment, and transfer of low-carbon technologies primarily for projects in the power and transport sectors and energy efficiency. It is administered by the World Bank on behalf of the CTF Trust Fund Committee which comprises other multilateral institutions. For more information, see <http://www.climateinvestmentfunds.org/cif/> The CTF was expected to contribute about US\$ 350 million to the financing of the Project (PAD: footnote 54).

their respective processes, consistent with their independence and the confidentiality of their work.<sup>16</sup>

11. According to the PAD (p. ii), the Project has been classified as Category A, so it triggers *inter alia* the following World Bank safeguard policies: Environmental Assessment (OP 4.01), Natural Habitats (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP 4.12), and Projects on International Waterways (OP 7.50). Except for the policy on Projects on International Waterways, compliance with these policies is being addressed through OP/BP 4.00: Piloting the Use of Borrower Systems, for which a safeguards diagnostic review has been prepared.
12. The PAD states that the implementing agency, Eskom, has not carried out a project of this size since the 1980s, and has subsequently lost some of the capabilities it had. However, it has taken steps to ensure adequate institutional arrangements are in place to implement the Project (PAD: Annex 6, para. 1). These include hiring experienced engineering partners, and putting in place a Medupi Leadership Committee comprising Eskom's senior management, a Medupi Project Team, and 38 Medupi execution teams to oversee specific contracts (PAD: paras. 126-127).
13. The PAD also states that no new coal mines will be developed to provide coal to the Medupi Power Plant. Coal for the Medupi plant will be supplied for 40 years by expanding the capacity of the existing Grootegeluk Mine, an open-pit coal mine that is owned by the Exxaro Group and located approximately 3 km from Medupi, and will be transported via a conveyor system included under the Project. This expansion is to occur within the existing boundary of the mine, and two new coal processing units will be added to the existing six units to handle the increased production.



Picture 2: View of Grootegeluk Coal Mine, Lephalale.

Source: Synergistics Environmental Services Report S0123/01, August 2006, Revision 02

14. South Africa's Department of Water Affairs (DWA) is responsible for ensuring adequate water supply for the Medupi Power Plant and the Grootegeluk Mine.

<sup>16</sup>Memorandum Of Understanding between Inspection Panel (World Bank) and Independent Review Mechanism (African Development Bank) Regarding Sharing Of Information on the Medupi Power Project Investigations, September 15, 2011.

According to the PAD (para. 273), the Medupi plant will initially require about six million cubic meters of water per year to operate its six units, and will require an additional six million cubic meters of water after the flue gas desulfurization (FGD) technology is installed. The Guarantee Agreement provides that GoSA shall “*take timely action to ensure adequate supply of water to the Medupi Power Plant for the operations of the Borrower’s six units, including the FGD units*” (Guarantee Agreement: Section 3.01 (e) p. 2).<sup>17</sup>

### C. Request for Inspection

15. On April 6, 2010, the Inspection Panel received a Request for Inspection related to the then-proposed Republic of South Africa: Eskom Investment Support Project to be financed by the International Bank for Reconstruction and Development (IBRD).<sup>18</sup> The Request was submitted by representatives of community members living in the Project area in Lephalale in Limpopo Province (the “Requesters”) through groundWork and Earthlife Africa, two non-governmental organizations based in South Africa. The Requesters stated that they are likely to suffer direct impacts from the Project and its associated facilities and related infrastructure. The Requesters also asked that their identities be kept confidential and that groundWork and Earthlife Africa act as their designated representatives.
16. The Requesters allege a number of issues of non-compliance and harm. Some of their claims involve instances of alleged harm that are local in nature and affect community members in Lephalale directly, whereas other instances of alleged harm may have wider impacts. Some claims refer explicitly to lack of compliance with World Bank operational policies and strategies, and some refer to concerns about relying on national legislation and standards to comply with World Bank operational policies and strategies. During the Panel’s field visits, the Requesters elaborated on their claims and introduced the Panel team to other local stakeholders, including farmers who were concerned about sand mining in the Mokolo River and its effects on water quantity and quality.
17. The claims, as presented in the Request for Inspection, are summarized below.
18. **Claim No. 1: Health impacts from air pollution:** The Request states that communities are seriously concerned about the potential health impacts from the expected “*significant*” emissions from the Medupi Power Plant. They are particularly concerned about communities living in the vicinity of the coal-fired plant who will be exposed to “*increased levels of particulates and sulfur dioxide, which already exceed local and international air quality limits.*”
19. **Claim No. 2: Impacts on water resources:** The Requesters fear that the Medupi Power Plant and its sulfur scrubbers for pollution abatement will put additional strain on existing water sources in an area already suffering from water scarcity. During its discussions in the field, the Panel discerned four distinct areas of concern related to water which are elaborated upon in Chapter 5.

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<sup>17</sup> Guarantee Agreement entered into between the Republic of South Africa and the International Bank for Reconstruction and Development, dated April 16, 2010.

<sup>18</sup> Request for Inspection available at: [www.inspectionpanel.org](http://www.inspectionpanel.org)

20. **Claim No. 3: Impacts on livelihood:** The Requesters believe the Medupi coal-fired power plant will have “*detrimental*” impacts on the livelihoods of people living in and around Lephalale as the industrial activity and pollution will negatively affect agriculture, livestock rearing, and ecotourism.
21. **Claim No. 4: Impacts on cultural heritage and practices:** The Requesters claim that there could be negative impacts on cultural heritage and practices because of the “*destruction*” of grave sites during construction of the Medupi plant and changes in the availability of sources of traditional medicinal plants as a result of the Project.
22. **Claim No. 5: Impacts arising from an influx of laborers:** The Requesters state that “*a significant expansion of mining in the area of the Medupi plant could entail environmental and social impacts from an influx of laborers,*” and that since mine workers traditionally receive low wages while working under difficult conditions, this could lead many of them to suffer from health problems.
23. **Claim No. 6: Involuntary resettlement:** The Request states that the Project could cause involuntary resettlement due to transmission lines associated with the Medupi Power Plant and the construction of the wind, solar, and rail facilities. Moreover, they believe the World Bank has remained “*ambiguous*” about whether South Africa’s national legislation on resettlement is equivalent to World Bank policy, and since the World Bank is applying its Use of Borrower/Country Systems approach to the Project, they feel the issue of equivalence should be examined in the interest of the potentially displaced persons.
24. **Claim No. 7: Impacts on energy access for the poor:** The Requesters claim that the Bank provides no evidence for its argument that the Project will allow the Borrower to provide electricity to the 20% of the South African population that presently has no access to electricity. The Requesters believe that the Project will mainly benefit large industries.
25. **Claim No. 8: Impacts on the national economy:** The Requesters claim that repayment of the World Bank loan will “*require more exports and higher tariffs*” to compensate for any future currency devaluation. The Requesters also note that South Africa routinely experiences currency crashes, five of which took place after 1996 and resulted in a devaluation of 15% or more.
26. **Claim No. 9: Impacts from associated coal mining:** The Requesters state that expansion of activities in the mines from which the Medupi Power Plant will receive its coal raises environmental concerns, in particular with respect to acid mine drainage.
27. **Claim No. 10: Climate change impacts and country obligations:** The Requesters believe that the Project will “*compromise the World Bank’s commitments on climate change*” and make it more difficult for South Africa to reduce its greenhouse gas emissions and meet its commitments. Moreover, they allege there is no certainty to the claims made by the World Bank that the use of cleaner coal technology or carbon capture and storage will sufficiently control the “*enormous amounts of pollutants*” to be produced by the Project. Finally, they state that the Bank’s support for the Project contradicts the report of the external Expert Panel<sup>19</sup>, appointed in October 2009, which

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<sup>19</sup> Expert Panel, 2010. This Expert Panel is appointed by World Bank Management.

*“raises doubts about the World Bank supporting Medupi without adequately complementing it with renewable energy development.”*

28. **Claim No. 11: Inadequate consideration of alternatives to coal:** The Requesters claim that the World Bank did not *“adequately consider alternatives to coal,”* including a demand-side management alternative and particularly the renegotiation of the contracts with the largest industries, which receive a significant share of South Africa’s electricity at extremely low rates. This claim has two overlapping perspectives, namely the alternatives to coal for the energy generation component and the setting of tariffs for industrial users in relation to demand-side management.
29. **Claim No. 12: Cumulative impacts:** The Requesters claim that concerns with respect to the Medupi plant are *“compounded by the potential cumulative impacts of the planned and existing generation facilities”* around the plant area which include Matimba, the proposed Mmamabula power plant across the border in Botswana, a planned Sasol coal-to-liquid fuels plant<sup>20</sup>, and other planned coal mines and plants.
30. **Claim No. 13: Reliance on country systems:** The Requesters claim that South Africa *“has a problematic track record of actually abiding by and implementing its environmental and social obligations,”* and hence the Project’s reliance on South African laws, policies, and institutions to implement and monitor the Project will be *“inadequate”* to protect peoples’ health and well-being. The Requesters also claim that South African laws and standards are not equivalent to key elements of Bank policies and believe proposals to fill gaps in the legislation are inadequate.
31. **Claim No. 14: Human rights:** The Requesters claim that South Africa’s actions related to the Project *“violate the human rights of the communities, and are inconsistent with the South African Constitution and the African Charter on Human and Peoples’ Rights.”* Article 24 of the South African Constitution recognizes that *“everyone has the right to an environment that is not harmful to their health or well-being”* and allows for the protection of the environment for the benefit of present and future generations.
32. **Claim No. 15: Legacy of World Bank involvement:** The Requesters claim that the Bank’s legacy in South Africa’s energy sector, including the issue of reparations, should be examined as part of the Project. The Requesters state that World Bank-financed coal-fired power plants during apartheid provided electricity to large industry and white South Africans while all citizens had to repay the loans.
33. Also, during the field visits of the Panel team, the Requesters and affected people re-affirmed and elaborated upon their concerns which, in their opinion, will cause externalities of the Project at local, national, and international levels. They alleged that these externalities had not been properly assessed and addressed as required by Bank policy, and that this will result in significant harm to both people and the environment.

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<sup>20</sup> Sasol Ltd. is a South African state-owned enterprise involved in mining, energy, chemicals, and synthetic fuels.

## D. Management Response

34. This section summarizes World Bank Management's responses to the claims filed by the Requesters.<sup>21</sup> It draws information mainly from the Management Response except in a few instances where it uses other Project documents in order to explain clearly the issues at hand.
35. Management believes that extensive due diligence has been carried out during the Project preparation process and that, through such due diligence, the requirements of Bank guidelines, policies, and procedures, including those applicable to the matters raised in the Request, have been met. Moreover, Management believes that the Requesters' rights or interests have not been, nor will they be, directly and adversely affected.
36. Management states that it would like to continue a dialogue with civil society during implementation and supervision of the Project, and that it is committed to closely monitoring progress on all the issues mentioned in the Request for Inspection, as well as monitoring the Borrower's obligations with respect to the Project.

### 1. Use of Borrower/Country Systems

37. The EISP is a Category A project that the Bank is financing as a scaled-up pilot project under OP/BP 4.00, *"Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects."* Management writes that it started preparing the Safeguards Diagnostic Review for the EISP in late 2008 during the Project's concept stage, as part of its due diligence to ascertain whether the Project should be processed as a pilot of the Bank's UCS policy (MR: para. 26). Contrary to the Requesters' claims, Management states that South Africa was selected for the UCS pilot initiative because *"it has an established legal and regulatory system and a favorable reputation for effective implementation of its systems governing environmental assessment and protection of natural habitats, protected areas, physical cultural resources, and involuntary resettlement"* (MR: para. 25). The Management Response concludes (para. 31) that *"the Bank team was satisfied that South Africa has the enabling legal and regulatory framework and Eskom has the institutional capacity"* as required by OP 4.00 to implement the Project.
38. Management states that the safeguards-related documentation of the Project was already developed and construction of the Medupi Power Plant component of the Project was underway when the Bank's engagement began. Management believes that *"this unusual aspect of the timing of the Bank's engagement proved valuable in assessing the integrity and robustness of the Department of Environment's (DEA) environmental review and approval process and the acceptability of Eskom's corporate practices prior to the decision by the Government to seek Bank support for Eskom's investment program"* (MR: p. vi).
39. According to Management, the final Safeguards Development Review, dated March 2010<sup>22</sup>, concluded that South African systems are equivalent to the Objectives and

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<sup>21</sup> Management Response available at: [www.inspectionpanel.org](http://www.inspectionpanel.org)

<sup>22</sup> "Safeguards Diagnostic Review for South Africa - Eskom Investment Support Project," March 11, 2010 (World Bank, 2010d; hereinafter referred to as "SDR").



Operational Policies outlined in OP 4.00 Table A1 with respect to OP 4.01 (Environmental Assessment), OP 4.04 (Natural Habitats), and OP 4.11 (Physical Cultural Resources), but that two gaps between the Bank's and South Africa's systems needed to be filled with regard to Involuntary Resettlement. The first gap, regarding monitoring of resettlement actions until project completion, was judged not to be a gap in Eskom's practice, because Bank Management believes that Eskom regularly conducts resettlement monitoring. The second gap, related to disclosure, was filled by Eskom by disclosing the Resettlement Policy Framework prior to Project appraisal.



Picture 3: Medupi Power Plant under construction (October 2010)

## **2. Disclosure and consultation**

40. Management states that South African authorities had followed the necessary disclosure and public consultation requirements before the Bank became involved with the Project. Management believes the disclosure and consultation processes carried out by South African authorities for the Medupi Power Plant, the Sere Wind Power Project, the Upington Concentrating Solar Power Plant, and the Majuba Rail Project as part of their environmental impact assessment processes were conducted in an open and transparent manner and were well documented. Management also believes (MR: para. 10) that South Africa has a "*robust and mandatory system*" of disclosure and consultation that requires the disclosure of draft and final environmental and social documents, provides for notifying and updating "*Interested and Affected Parties (I&APs)*," requires the holding of public hearings in affected areas, and follows a practice of disseminating information in the print and electronic media in appropriate languages besides English and Afrikaans (MR: para. 33).

## **3. Response to specific claims**

41. Management's response to specific claims by Requesters is summarized below, along with relevant contextual information. A more detailed description of the response to the specific claims of harm is presented in Chapter 5.

42. **Re Claim No. 1: Health impacts from air pollution.** Management states that it has reviewed the extensive environmental, social, and health analysis undertaken by Eskom as part of the EIA process and notes that this is based on robust air quality modeling, an appropriate baseline and parameters as inputs to the models, and conservative thresholds (e.g., ambient air quality criteria). The Management Response states that there will be no significant incremental impact of air emissions from the Medupi Power Plant on human health from particulate matter, mercury and other heavy metal emissions, and sulfur dioxide (para. 59), and that the human health risks of not immediately installing abatement technology are acceptable (para. 63).
43. **Re Claim No. 2: Water-related harm.** The Management Response states that the Medupi Power Plant's early water needs will be met by extending to Medupi the Exxaro-owned water transmission main which brings water from the Mokolo Reservoir to the Matimba Power Plant, the Grootegeluk Mine, and the Lephalale Municipality. This water is already available as the reservoir is currently not fully used by its other authorized users, and supply from this source will be augmented by "*de-bottlenecking*" nine km of the water main so that this can serve both the Medupi Power Plant and the Lephalale municipality. Subsequently, the Medupi Power Plant's water needs, as well as the additional needs of an expanded Grootegeluk Mine, will be met by the Department of Water Affairs (DWA) through the implementation of the first two phases of the Mokolo-Crocodile (West) Water Augmentation Project (MCWAP).
44. **Re Claim No. 3: Impacts on livelihoods.** The Management Response (p. v) states that the Environmental Impact Report (EIR) for EISP "*adequately*" identifies and addresses the impacts of the Medupi Power Plant on livelihoods and that Management is confident that mitigation measures are in place to avoid or minimize such impacts. Management says it reviewed the EIR and concluded that that report had adequately identified and addressed the Project-related impacts on people's livelihoods and on the environment in the Project area during the construction and operation of the Medupi plant, and that appropriate measures had been put in place to avoid or mitigate them. Moreover, Management believes the Record of Decision (RoD) for the Project requires a monitoring system that includes representation of local communities.<sup>23</sup>
45. **Re Claim No. 4: Impacts cultural heritage and practices.** Management states that the conservation of cultural resources is a key issue in the RoD and that it is satisfied South Africa has the necessary regulations and Eskom the institutional capacity to implement the Project while conserving the natural habitat and physical cultural resources in the area (MR: p. 31). Management writes (MR: para. 5) that five graves were discovered during the field survey of the Medupi Power Plant: four in an informal cemetery outside the plant's boundary and one within the boundary. Management believes the treatment of grave sites has been in accordance with South Africa's National Heritage Resources Act (Act 25 of 1999) and Environment Conservation Act (Act 73 of 1989) which is "*consistent*" (MR: para. 5) with the operational principles outlined in OP 4.00 Table A1. With respect to traditional herbs and medicinal plants, Management states that clearing of the site would not significantly reduce the availability of plants with medicinal uses associated with cultural practices in the area.

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<sup>23</sup> The Record of Decision is issued by the competent environmental authority. It is an environmental authorization and formal decision document which is recorded for the public.

46. **Re Claim No. 5: Impacts arising from an influx of laborers.** Management acknowledges that the expanded workforce will put pressure on housing and municipal infrastructure and services, and that increases in sexually transmitted diseases and social conflict can occur. However, Management states, in relation to associated coal mining at Grooteegeluk Mine, that “*The amended EMPR [Environmental Management Program Report] contains measures to address these impacts*” (MR: p. 26, §7).
47. **Re Claim No. 6: Involuntary resettlement.** Management states in its Response that the land for the Medupi site was purchased and involved no involuntary resettlement. Likewise, involuntary resettlement is not expected for the Sere Wind Power or Upington CSP projects financed by the Loan. Concerning the route for the Majuba rail link, Management states land has been purchased through a combination of rights-of-way as well as outright purchases (MR: Annex 1, § 11). Management states that South African legal requirements for resettlement and compensation are broadly consistent with Bank policy, and that Eskom’s procedures and practices compensate in an appropriate manner for the differences found.<sup>24</sup> The Management Response does not address specifically involuntary resettlement that may result from transmission line construction.
48. **Re Claim No. 7: Energy access for the poor.** Management states that South Africa and Eskom have broadened access to electricity from 34% to 81% of the national population since 1994 and though the Project does not finance new connections, the Government has made provision for connecting the remaining 19 percent of households, the majority of whom are poor, by 2014. The Government’s free basic electricity policy, launched in 2003, provides 50 kilowatt hours (kWh) per month free of charge to poor households, and presently about 25 percent of households benefit from this policy (MR: para. 16). Management states that the poor are also sheltered from the full impact of tariff increases in general by a lifeline tariff based on cross-subsidies for consumers who use less than 350 kWh/month of electricity (MR: p. iv). With respect to tariff increases, Management states that the Bank has no role in tariff-setting, which is done by the independent National Energy Regulator of South Africa (NERSA). The Bank has reviewed the tariff structure and “*believes that the announced tariff minimizes the impact on the poor*” (MR: Annex 1, § 18). Management does not believe that poor and residential consumers will pay a disproportionate share of the costs for building this Project, and also points out that many of the Special Pricing Agreements (SPA) will be renegotiated as publicly announced by GoSA (MR: Annex 1, § 19). In a subsequent communication, Management has informed the Panel that one SPA has been renegotiated and others are pending (Management Communication, November 3, 2011).
49. **Re Claim No. 8: Adverse impacts on the national economy.** Management believes that the loan for EISP will not put undue stress on the country’s foreign exchange situation, as the payment on the principal amount will be equivalent to no more than 0.1% of the country’s total exports in any given year. Management states that according to analysis that it undertook in conjunction with the Department of National Treasury, the loan repayment amount is consistent with the country’s prudent debt policy. Moreover, the IBRD loan is the cheapest and longest-maturity loan available to Eskom

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<sup>24</sup> As noted previously, Management states that the Safeguards Diagnostic Review for the EISP identified two gaps in the South African regulatory framework. One gap related to the monitoring of resettlement actions and reporting on progress until project completion; it was found not to be a gap in Eskom’s practice because Eskom does this type of monitoring regularly. The second gap, related to disclosure, was filled when Eskom disclosed the Project’s resettlement policy framework (MR: para. 29).

from any financial source, totaling 9% of Eskom's total liability when the Project is commissioned in 2012 (MR: Annex 1, § 20).

50. **Re Claim No. 9: Impacts from associated coal mining.** The Management response indicates that neither the Bank nor the South African Department of Environmental Affairs (DEA)<sup>25</sup> considers coal supply to be an associated project of EISP because no new coal mine is being specifically developed for the Project. Therefore, they do not believe it should be covered in the Project's environmental assessment. Management asserts that the expansion of the Grootegeeluk Mine is within original permit boundaries and therefore South African laws do not require a new authorization, but rather an amendment, reviewed and sanctioned by Bank experts, to the original environmental management program report in terms of mining law. Management acknowledges that some groundwater contamination may be caused by stormwater runoff but assures that necessary steps are being taken to avoid consequent harm (MR: p. 25).
51. **Re Claim No. 10: Emissions from Medupi and South Africa's international commitments with respect to climate change.** The Management Response states that GoSA's commitment to following a low-carbon path has been signaled by several national and international climate-change-related agreements that it has signed. This commitment includes meeting an urgent need for generation expansion while pursuing an aggressive program to enhance energy efficiency measures and introduce renewable energy and demand-side management. Management notes in Project documentation that Medupi uses the best available and reliable technology which reduces emission levels of conventional pollutants to comply with international good practice and minimize CO<sub>2</sub> emissions. Moreover, Management states that the Bank's support for this Project is based on a long-term plan for partnering with South Africa, within the ambit of the country's low carbon strategy, on the future of its energy sector.
52. **Re Claim No. 11: Inadequate consideration of alternatives.** Management states that South Africa has developed a credible low carbon strategy, based on long-term mitigation scenarios that considered a range of energy options. According to Management, under a two-pronged approach GoSA has: (a) assigned the highest priority in the near term to improving generating capacity; and (b) adopted strategies to accelerate demand-side management, energy efficiency, and investments in clean energy, and pursue regulatory and economic instruments to stabilize greenhouse gas emissions over the medium term and eventually reduce emissions over the long term, as envisaged in its low carbon strategy (MR: para. 9).
53. Management also states that there are no immediate domestic alternatives to coal for ensuring electricity supply in South Africa. The greatest potential for large renewable projects lies in concentrating solar power (CSP) and wind power. However, CSP technology is in the early stages of development and cannot be relied on for South Africa's large base-load needs. Comparable state-of-the-art solar power technologies with storage characteristics to mimic base-load supply from coal are not mature enough, and new hydropower potential hardly exists in South Africa (MR: para. 12).
54. **Re Claim No. 12: Cumulative impacts.** The Management Response indicates that cumulative impacts are considered by GoSA and that air quality models have considered the cumulative impacts of the Medupi Power Plant. The Response advises that the DEA

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<sup>25</sup> DEA was formerly the Department of Environmental Affairs and Tourism (DEAT)

is prepared to take action against air quality deterioration in the area of the plant and that GoSA, the Government of Botswana, and Eskom are collaborating on air quality monitoring actions (MR: Annex 1, § 9-10). Management also states that a Waterberg Environmental Management Framework is being developed as a part of an overall approach to strategic and cumulative impact assessment.<sup>26</sup> This Framework will examine current conditions and long-term management options for biodiversity conservation, air quality, water supply, agricultural development, ecotourism, and industrial and population growth (MR: para. 68).

55. **Re Claim No. 13: Reliance on country systems.** Management explains that South Africa was selected for a UCS project because of its established legal and regulatory systems and because of its favorable reputation for implementing environmental and cultural protection policies. Eskom, Management states, has shown itself to be particularly focused on meeting or exceeding requirements in project implementation. The Bank points to the Safeguards Diagnostic Review as evidence that a broad range of criteria were considered (as outlined in OP 4.00) in determining eligibility for the use of this approach.
56. **Re Claim No. 14: Human rights.** Management states that it is “*not within the Bank’s mandate to determine compliance of government actions with member government’s legislation*” and that “*this allegation can only be tested before a South African court that has jurisdiction to opine on the Constitution of South Africa*” (MR: Annex 1, § 12).
57. **Re Claim No. 15: Legacy issues.** Management states that its records show that four loans were made to South Africa in the energy sector in the 1950s to 1960s, and that there is no connection between these loans which closed more than 40 years ago and EISP. Moreover, Management believes the issues the Requesters raise regarding reparations have no basis, because the Bank’s operational policies did not exist at the time of the earlier loans, nor is there a current policy or law that requires the Bank to examine such a claim. Management clarifies that even so, such a claim could only be investigated if it were raised by a government that was party to such transactions. Furthermore, Management points out that the previous loans were not intended to benefit a certain group over another (MR: Annex 1, §16).

## E. The Investigation Process

### 1. Eligibility of the Request for Inspection

58. As established in its founding Resolution<sup>27</sup>, the Inspection Panel determined whether the Request for Inspection met the eligibility criteria set forth in the Resolution and in its subsequent 1999 Clarification.<sup>28</sup>

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<sup>26</sup> The Panel is informed that the EIA was finalized on December, 2010. See: Environmental Management Framework for the Waterberg District, Environmental Management Framework Report. December 2010. DEA, Limpopo Provincial Government (Dept Economic Development Environment and Tourism) and Waterberg District Municipality. Environomics Environmental Consultants, NRM consulting and MetroGIS.

<sup>27</sup> International Bank for Reconstruction and Development (IBRD), Resolution No. IBRD 93-10, dated September 22, 1993 (“the Resolution”).

<sup>28</sup> Second Review of the Resolution Establishing the Inspection Panel (“the 1999 Clarification”).

59. To do so, the Panel reviewed the Request and Management Response and visited the Project area from May 10, 2010 through May 13, 2010. During its visit, the Panel team met with groundWork, Earthlife Africa, government officials, Eskom Holdings staff, and Bank staff. The Panel team also visited Lephalale in Limpopo Province where the Requesters live, and met with the signatories of the Request for Inspection. Moreover, while in Lephalale, the Panel team met with local councilors, traditional chiefs, representatives of local NGOs, business fora, unions, and local residents claiming to be affected by the Medupi Power Plant. The Panel also met with members of national and local NGOs and academics in Johannesburg.
60. The Panel determined in its Eligibility Report<sup>29</sup> that the Request satisfied the eligibility requirements for an investigation and noted that important questions of compliance and harm were raised. On July 29, 2010 the Board approved the Panel's recommendation to carry out an investigation on issues of policy compliance and harm raised by the Request.

## **2. Scope of the Investigation**

61. On July 12, 2010, some members of the World Bank Board of Executive Directors requested a discussion to seek additional clarity on some issues mentioned in the Eligibility Report. The Board meeting to discuss these issues was held on July 29.
62. Prior to the meeting, some Executive Directors, while agreeing with the Panel's recommendation for an investigation and not questioning its merits, raised questions about the scope of a proposed investigation. These Executive Directors felt that the Panel's Eligibility Report could have been more precise on what the Panel recommended to investigate; in particular, there was a question as to whether the Panel was recommending an investigation of all the issues raised in the Request, or only those that raised issues of policy compliance.
63. During the Board meeting, the Panel Chair clarified the scope of the Panel's investigation within the context of its founding Resolution, highlighting in particular that the investigation would focus on the issues raised by the Request that relate to allegations of violations of World Bank operational policies and procedures. The Panel Chair noted that, although at the eligibility stage the Panel is not required, as per Paragraph 9 of the 1999 Clarification, to suggest a particular scope of the investigation, Paragraph 13 provides the framework for Panel investigations. It states that the report will "*focus on whether there is a serious Bank failure to observe its operational policies and procedures with respect to project design, appraisal, and/or implementation*" and will "*discuss (...) only those material adverse effects, alleged in the request, that have totally or partially resulted from serious Bank failure of compliance with its policies and procedures*".
64. The Panel Chair also clarified that, by summarizing the many issues raised in the Request, the Panel had not intended to suggest that it would investigate each of the issues raised, some of which are clearly not covered by Bank policies and procedures. He noted that the Report had enumerated the core topics which, in the Panel's view, would be addressed in an investigation, and had highlighted three important issues –

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<sup>29</sup> "Inspection Panel Report and Recommendation, South Africa: Eskom Investment Support Project (IBRD Loan No. 78620) (INSP/R2010-0003), June 28, 2010."

application of the policy on the use of Country Systems, local socio-economic and environmental impacts, and project externalities at different levels -- as the areas warranting an investigation within the purview of Bank policies.

65. The Panel chair also clarified that the Panel did not intend to investigate issues raised in the Request that do not relate to policy compliance, such as claims about the legacy of World Bank involvement and the Constitution of South Africa. He noted that, with respect to climate change, the Panel would be guided by OP 4.00 - Piloting the Use of Borrower Systems, which calls for the Bank to consider if the borrower's system is designed to achieve, among other elements, the objectives of the operational principle to *"assess potential impacts of the proposed project on physical, biological, socio-economic and physical cultural resources, including transboundary and global concerns, and potential impacts on human health and safety"*, as well as the separate provision of OP 4.00 that addresses *"mitigation measures"* and other actions to prevent or minimize adverse impacts.
66. The Panel Chair said that the Panel would be guided by this policy provision in assessing, for instance, issues relating to greenhouse gas emissions of the Project, and the potential mitigation actions contained in the Project to address these concerns. The Panel would not, however, investigate other climate change related claims mentioned in the Request that do not raise issues of compliance under Bank policy, such as for example whether the Project meets the requirements of the Bank strategy document "Development and Climate Change: A Strategic Framework for the World Bank Group".
67. With respect to impacts on the economy, the Panel Chair clarified that the Panel would similarly be guided by OP 10.04 - Economic Evaluation of Investment Operations, should it need to examine whether the Bank adequately assessed the impacts of the Project on South Africa's economy. The Panel would not investigate other claims mentioned under this heading in the Request that do not raise issues of compliance under Bank policy.
68. The Panel also clarified that, according to the Resolution, it is not within the mandate of the Panel to question Board decisions or to examine its judgment regarding the objectives of the Project to meet South Africa's energy needs. The Panel further noted that it does not investigate the country or the borrower. Under the Resolution, Management must propose to the Board specific actions to address the Panel findings and these actions may include specific recommendations about project implementation, including the disbursement of funds for the project.
69. In discussions with Board members prior to the Board meeting, questions were raised about the Panel's approach to the Use of Borrower Systems. In response, the Panel noted that the Panel fully appreciated the importance of this Policy and its underlying objectives and would be highly attentive to these points during an investigation.

### **3. Investigation process and methodology**

70. The focus of the Panel's investigation is to determine whether the Bank complied with its own policies and procedures in the design, appraisal, and implementation of the EISP, and whether, if instances of non-compliance were found, they caused or were likely to cause the harm alleged by the Request for Inspection.

71. The Panel conducted a two-part investigation directed by Panel Chairperson Roberto Lenton who served as the Lead Inspector for the Panel's investigation. The first part involved detailed research into Bank records related to the Project, as well as an extensive review of relevant Project documents. The second part entailed a fact-finding visit to the Project area and interviews with Bank staff involved in the Project. The Panel retained relevant independent experts to assist with the investigation. These experts were Susan Frances Brownlie, environmental impact assessment consultant; Mark Hodges, air quality consultant; Jacob Kijne, water resources consultant; Anthony Leiman, energy economics consultant; Mohan Munasinghe, climate change consultant; and William Ward, economics consultant.
72. A Panel team composed of Panel Chairperson Roberto Lenton, Panel Member Alf Jerve, Operations Officer Mishka Zaman, expert consultant on institutional matters Eduardo Abbott, and expert consultants Susan Frances Brownlie and Jacob Kijne visited South Africa during October 24-29, 2010. During its visit, the Panel team met with government officials, staff of the World Bank country office in Pretoria, Eskom Holdings Management in Johannesburg, Government officials in Lephalale and Polokwane, Requesters and civil society members in Lephalale, and NGOs in Pretoria interested in the issues under investigation.

#### **4. Design of the investigation**

73. As noted above, and in line with its Resolution, the Panel focused its investigation on issues raised by the Request that relate to allegations of violations of World Bank operational policies and procedures and related harm. Specifically, the Panel focused its investigation on those issues of potential material effect on the Requesters that were linked to the Project and covered by provisions of Bank policy. The Panel's assessment of compliance considered, principally, OP/BP 4.00 (the Use of Borrower/Country Systems), as well as OP/BP 10.04 (Economic Evaluation of Investment Operations), OMS 2.20 (Project Appraisal), and OP 10.00 (Investment Lending: Identification to Board Presentation).
74. The analysis of compliance is challenging in the present case, given that Eskom had already begun construction of the Medupi Power Plant before the Bank agreed to provide financial assistance. In this context, the Panel notes that Management's responsibility to ensure adherence to Bank policies may be considerably more difficult, given that much significant analysis had already been carried out by the Borrower prior to the Bank's engagement, and a specific project alternative already selected for implementation. A major question for the Panel, therefore, is whether the analysis of Bank Management supporting its recommendation to the Board to finance Medupi was consistent and in compliance with the Bank's operational policies and procedures.
75. As explained in more detail in Chapter 2, the Bank's UCS policy is designed to encourage the development and application of systems in borrowing member countries that satisfy Bank social and environmental safeguards, thereby encouraging capacity growth among the borrowing country's institutions. Among the projects considered by the Inspection Panel for investigation, the EISP is the first that includes the Bank's policy on piloting the Use of Borrower/Country Systems. OP 4.00 notes that OP/BP 4.00 will apply only to those areas where the Bank has determined equivalence with the



borrower/country's system and pilot projects will be subject to all other applicable operational policies and procedures.

76. As stated above, the Panel notes that the Use of Borrower/Country Systems involves an analysis at two levels. The first level is an assessment of the "equivalence" of the borrower systems with the operational safeguard policies of the Bank and the "acceptability" of the borrower's implementation practices, track record and capacity (referred to as a "system-level" assessment in this report). The second is a focused appraisal and evaluation of the specific project under consideration in this context (referred to as a "project-level" assessment in this report). Reflecting this two-tiered approach, the Panel's investigation into issues of compliance and related harm similarly focused at the system level and the project level.
77. The Panel's investigation of compliance at the system level focused on the Safeguards Diagnostic Review for the EISP, in which Bank Management analyzes equivalence and acceptability and identifies gap-filling measures (as relevant). This investigation is set forth in Chapter 3. The Panel's investigation of compliance at the project level (set forth in Chapters 4 and 5) considered relevant provisions of OP/BP 4.00, as well as other applicable Bank operational policies (non-safeguard policies) that apply to the Project directly.
78. With respect to OP/BP 4.00, the investigation focused on those key elements of the country system that assure equivalence with Bank policies and procedures. The Panel stresses that non-compliance with the Bank's policies and procedures may, or may not, be associated with harm. In line with its mandate, the Panel assessed whether or not instances of non-compliance may cause or exacerbate the issues of harm raised in the Request for Inspection.

## Chapter 2: The Project Context and Relevant Operational Policies

79. This Chapter outlines the key elements of Project context that have informed the Panel's analysis of policy compliance and related harm. It then provides a background review of Bank operational policies and procedures relevant to the Panel's analysis, including Bank policy on the Use of Borrower/Country Systems and the role of the Inspection Panel in this context.

### A. Project Context

#### 1. Local context

80. **Waterberg District.** The Medupi Power Plant is located in the center of the local municipality of Lephalale in the Waterberg District of South Africa's Limpopo Province. The Waterberg District is among the most disadvantaged areas in South Africa, according to both social and economic infrastructure indicators; levels of poverty are high, and worse in villages and among workers on commercial farms (Waterberg District Municipality Integrated Development Plan (IDP), 2010: p. 8). Communities have a high rate of unemployment, high levels of illiteracy, and high levels of HIV/AIDS and other health problems (Waterberg District Municipality IDP 2010: p. 4). Ageing infrastructure for water supply, sanitation, and agriculture is identified as a development challenge (Waterberg District Municipality IDP, 2011/12: p. 27).
81. Waterberg is a mainly agricultural district comprises six local municipalities, of which Lephalale is the largest and the second most populated.<sup>30</sup> About 95 percent (2001 census) of the population of Waterberg District are black (mainly Sepedi speaking) while the remaining are mostly Afrikaans-speaking whites (Waterberg IDP 2010-11: p.7). The Waterberg District is one of the major mining regions within South Africa in which platinum, iron ore, coal and diamonds are mined and is also home to a world renowned Biosphere (Waterberg District IDP, 2011-2012, p. 55).
82. **Lephalale Municipality.** Lephalale municipality constitutes vast rural areas comprising both commercial private farms and communal lands, and a still small but rapidly growing urban center covering Lephalale (Ellisras) town, the Marapong township, and the Onverwacht residential area. The governance system involves both municipal authorities and traditional tribal authorities.<sup>31</sup> According to the 2001 census, Lephalale municipality had a population of 96,000 people; 2007 estimates put the population at 120,000 inhabitants (Lephalale IDP Review, 2009-2010, p.17) of whom only 20,000 are urban based. (Lephalale IDP Review 2009-2010, p. 132). Total employment in Lephalale town is listed as approximately 5,300, 60% of whom are employed by Eskom or Exxaro (Lephalale IDP 2010-11: p. 133).
83. The black population generally live on farms predominantly owned by white South Africans (making up the agricultural workforce), in townships developed for industrial

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<sup>30</sup> Besides Lephalale, the other local municipalities are Mogalakwena Municipality, Modimolle Municipality, Mookgophong Municipality, Thabazimbi Municipality and Bela-Bela Municipality. See Waterberg District Municipality, 2011-2012 Integrated Development Plan, pages 11 and 16.

<sup>31</sup> The District has 12 Traditional Authorities according to Waterberg District IDP, 2011-2012, p. 81.

- development (e.g. the Marapong township associated with the Matimba Power Plant), or in villages and informal settlements. An estimated 62.8% of all households in the Lephalale Municipality are living in poverty (Lephalale IDP 2009-10: p. 106), and it is estimated that some 45% of households in the municipality earn less than R800 per month (R9,600 per year).<sup>32</sup> The same source indicates that 32% of children of school age do not attend school (based on 2001 census figures).
84. Social conditions are also affected by the coverage of public infrastructure. Only 70.6% of rural communities receives adequate water service as defined by local standards (Lephalale IDP 2009-10: p. 41); 23% of sanitation services are classified as “*below basic*” (IDP 2009-10: p. 55). Out of 129 public schools 60% have no water, 43% have inadequate sanitation, and 24% lack adequate electricity (Lephalale IDP 2009-10: p. 108). The poor condition and availability of infrastructure is worsened by the recent influx of people into towns, particularly Lephalale town.
  85. **Environmental issues.** Water is relatively scarce in the area and conservation of water resources is seen as a priority. Linked to this issue, the need to determine and maintain the ecological reserves for all rivers in the area is urgent, according to the Environmental Framework for the Waterberg District.<sup>33</sup> Water pollution – caused by industrial pollutants, acid mine drainage, untreated sewage, and agricultural runoff – is identified as one of the major issues; the quality of water for human consumption is a concern particularly in the rural settlements and smaller towns. The potential for acid mine drainage from future coal mines aggravates the risks of deteriorating water quality, posing a risk to water users and the health of freshwater ecosystems. Another key environmental concern is deterioration in air quality, especially given the probable future development of the Waterberg coal field with associated industrial and power generation projects.
  86. **Economy.** The main sectors in the Waterberg District are mining, agriculture – which includes crop, cattle, and game farming – and tourism. According to the Province’s Growth and Development Strategy, mining accounts for 22% of the GGP and agriculture is 28.8%.<sup>34</sup> Game and cattle farming occupies more land than any other sector. Tourism – especially related to hunting and game viewing—has been the fastest growing sector. The district harbors significant resources in the form of biodiversity, scenic landscapes, and cultural heritage.
  87. **Development of coal.** An estimated 43% of South Africa’s coal reserve, estimated at close to 50 billion tons, lies in the Waterberg Basin. The Grootegeluk Mine started operating in 1980 and is thus far the only coal mine in the Waterberg District. This situation is likely to change with a number of applications for coal mines in the area.<sup>35</sup> The 3,990 MW Matimba Power Station, which started operating in 1987, was the first heavy industrial development in the district. Sasol (South African Coal and Oil) is evaluating the area to establish a coal-to-liquid fuels plant, and environmental impact

<sup>32</sup> Environmental Impact Assessment Report for the proposed establishment of a new coal-fired power station in the Lephalale area, Limpopo Province. Final Report. Ref No 12/12/20/695. 22 May 2006. Bohlweki Environmental (Pty) Ltd. (the “Medupi EIR”)

<sup>33</sup> Environomics Environmental Consultants and others, 2010, “Environmental Management Framework for the Waterberg District,” December 2010 (hereinafter referred to as “EMF”), p. 68.

<sup>34</sup> See [http://www.limpopo.gov.za/index.php?option=com\\_content&view=article&id=5&Itemid=7](http://www.limpopo.gov.za/index.php?option=com_content&view=article&id=5&Itemid=7)

<sup>35</sup> For example, Firestone Energy Ltd has been granted rights to mine coal for 30 years over seven properties. Source: Mining.com, 4 August 2011.

assessments for two new thermal power stations are underway for Eskom near Steenbokpan (close to Lephalale). The main constraints on coal development are seen to be inadequate infrastructure and insufficient water.

## **2. National Context - Energy**

88. South Africa's economy is capital- and energy-intensive, reflecting rapid urbanization and electrification, a mechanized manufacturing sector, and a mining sector with high demands for electric power. According to the South Africa Environment Outlook's report on the state of the environment (DEAT 2006a)<sup>36</sup>, the population growth peaked at 2.9% per year in the early 1980s, but has declined since to around 1.7%<sup>37</sup>. Given a growing population and industrialization, water is a major constraint: projections are that by 2025 there will be a national water deficit<sup>38</sup>. Water quality issues are an additional concern<sup>39</sup>. Climate change is expected to exacerbate these challenges.<sup>40</sup> Air quality is another pressing environmental issue: pollutant concentrations, particularly for sulfur dioxide and particulates, exceed health thresholds in major urban areas across the country<sup>41</sup>.
89. Coal is the main fossil fuel for energy use in South Africa and supplies about 75% of the total energy used. In 2002, thermal power stations were the largest producers of SO<sub>2</sub> and NO<sub>x</sub> in the country and accounted for 36% of the total particulates in the air (EMF: p. xxi). Given that 79% of the country's emissions of greenhouse gas (GHG) are attributable to energy supply and use, the focus of the tension between national development objectives and climate change mitigation objectives is therefore the energy system.
90. In developing appropriate policy responses to climate change, GoSA recognizes that it must make the transition to a climate-resilient and low-carbon economy and society. It has voluntarily developed and begun implementing a long-term low carbon strategy based on a Long Term Mitigation Scenarios (LTMS 2007)<sup>42</sup> study, which sets emissions goals and guides its long-term choices of energy sources to stabilize and then reduce carbon emissions. The strategy promotes a shift away from coal toward renewable and nuclear energy, with a view to ensuring that the carbon emissions from all sources, including electricity generation, peak during 2020 and 2025 at 34% and 42% respectively below the "business as usual" baseline, plateau to 2035, and then begin declining thereafter.
91. Shortly after its transition to democracy in 1994, South Africa started the mass electrification program referred to in the Bank's Management Response. The program increased the levels of electrification from 34% to 81% in 2007 (PAD, Annex 1, para. 79), but without any significant additions of new generation capacity. In 2003, GoSA

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<sup>36</sup> DEAT, South Africa Environment Outlook. A report on the state of the environment. 2006.

<sup>37</sup> World Bank, 2010. The Little Data Book 2010, p. 191.

<sup>38</sup> Ibid, p166.

<sup>39</sup> Ibid, p159.

<sup>40</sup> See Republic of South Africa, Department of Environmental Affairs, South Africa's Second National Communication under the United National Framework Convention on Climate Change, August 2010.

<sup>41</sup> Ibid, p.230-231.

<sup>42</sup> Long Term Mitigation Scenarios: Technical Summary, Department of Environment Affairs and Tourism, Pretoria, October 2007.

launched the Free Basic Electricity (FBE) policy, which provides a minimum of 50kWh of free electricity to the poor: an estimated 3 million households.<sup>43</sup>

92. By the end of 2007, power generation capacity in South Africa had fallen short of peak demand (PAD: para. 29).<sup>44</sup> The global economic crisis and recession of 2008/09 meant that the country was “*rudely confronted with the consequences of a malfunctioning coal-fired, state-controlled electricity generation and supply industry*” (Strydom and King, 2009). Load shedding by Eskom in late 2007/08, to prevent system collapse, led to major shutdowns in the mining industry and a drop in manufacturing, with massive job losses and related growth in poverty. The impact on the country’s economy was serious: GDP growth fell to its lowest level in more than six years.
93. In essence, South Africa is now short of base-load generating capacity.<sup>45</sup> Even if GDP growth is slow, electricity demand is expected to exceed supply by around 2013. The development of diesel-driven gas turbine systems in 2010 has helped to meet peak demand, but only at an operating cost that is untenably high in the long run.

### 3. Regional context

94. **Regional Cooperation.** After 1994 and the end of the apartheid era, South Africa has been playing an influential role in the region. The country is actively engaged in developing and implementing economic development and environmental strategies through both the Southern African Development Community (SADC) and the New Partnership for Africa’s Development (NEPAD) with its African Peer Review Mechanism. It is signatory to a number of bilateral and multilateral agreements.
95. **Coal.** Limpopo Province lies immediately to the east of the Limpopo River which forms South Africa’s border with Botswana to the west. Rich coalfields in the southern and eastern parts of Botswana traverse the border into the Waterberg District and extend into neighboring Zimbabwe. Both South Africa and Botswana plan to exploit these coal reserves in the longer term; in the immediate term, new coal mines are being planned in the Waterberg District to supply coal for power generation and industry, as seen above, and the Mmamabula coalfield is earmarked initially to supply a proposed 2,400MW thermal power station in Botswana and provide coal for a coal-to-hydrocarbons project (EMF: p. 65).
96. **Energy and Water resources.** South Africa is the economic engine of the Sub-Saharan Africa (SSA) subcontinent. Eskom dominates the electricity market in the region by providing a significant proportion of the energy needs of its neighboring SADC countries through the Southern African Power Pool.

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<sup>43</sup> See <http://www.etu.org.za/toolbox/docs/government/basic.html#progress>, which indicates that since 1994, 3,803,160 households were connected to the electricity grid. Seventy percent of the population now has access to electricity. The national electrification program continues, with about 300 000 new connections per year.

<sup>44</sup> Targeted reserve margin in SA is a minimum of 15%, from 2007 that margin was 8-10%. See: [www.info.gov.za/otherdocs/2008/nationalresponse\\_sa\\_electricity1.pdf](http://www.info.gov.za/otherdocs/2008/nationalresponse_sa_electricity1.pdf). “*Since 2007, Eskom has experienced a lack of capacity in the generation and reticulation of electricity*”. South African Journal of Science. vol.106 no.1-2 Pretoria Jan./Feb. 2010: Forecasting electricity demand in South Africa: a critique of Eskom's projections. R Inglesi and A Pouris.

<sup>45</sup> [www.eskom.co.za/annreport10/downloads/eskom\\_ar2010.pdf](http://www.eskom.co.za/annreport10/downloads/eskom_ar2010.pdf)

97. South Africa shares river basins with six neighboring countries (Botswana, Lesotho, Mozambique, Namibia, Swaziland, and Zimbabwe). Although the availability of water increases sharply as one moves north from South Africa, the water available in four of these shared river systems<sup>46</sup>, including the Limpopo Basin, is under enormous pressure from demands for water in South Africa and neighboring states. A large proportion of South Africa's population, along with its industrial, mining, power generation, and agricultural activities, lives in these four shared basins. In each basin, the socioeconomic and ecological systems are interdependent, and rely heavily on the accessibility, availability, and reliability of supplies of good quality water.
98. Chronic water shortages already occur. The Water Crowding Index (WCI) defines the number of people per one million m<sup>3</sup>/year. A value of 1,000 is generally considered as the reasonable upper limit of people that water supplies can support.<sup>47</sup> In the year 2000, the number of people supported by an assured supply already exceeded this limit in all of the four shared river basins. The WCI in the Limpopo River Basin was as high as 4,200 in the year 2000.
99. The pressure on shared river systems will increase as each country seeks to develop its economy and provide water for urban and rural residents. If current water use patterns continue unchanged, not enough water will be available for new developments.<sup>48</sup> The anticipated shortfalls for the four basins combined (nearly 500 Mm<sup>3</sup>/yr) could constrain the planned expansion of industrial and mining activities (DWAF, 1997).

#### **4. Global context: climate change issues**

100. Global climate change is widely acknowledged in the international community as one of the most serious threats to sustainable development in the 21<sup>st</sup> Century. South Africa is a party to the United Nations Framework Convention on Climate Change (UNFCCC), the international treaty designed to stabilize greenhouse gas concentrations in the atmosphere to prevent dangerous anthropogenic climate change.
101. Since 1994, South Africa has engaged actively in global forums on sustainable development. South Africa announced (and reconfirmed in a letter to UNFCCC in January 2010) that it is ready to reduce the growth in its CO<sub>2</sub> emissions to 34% below current expected levels by 2020 and 42% by 2025, on condition that it is provided with the necessary finance, technology, and capacity building and that a legally binding climate deal is agreed. South Africa will host the 17th Conference of the Parties to the UN Framework Convention on Climate Change in Durban in November 2011.

<sup>46</sup> These six river basins are Incomati, Limpopo, Maputo, Orange-Senqu, Thukela and Umbeluzi. See P. Ashton, D. Hardwick, and C. Breen, 2008. Exploring sustainability science: a Southern Africa perspective. Chapter 9 (pages 279-310) in *Changes in water availability and demand within South Africa's shared river basins as determinants of regional social and ecological resilience*. Burns and Weaver (eds.)

<sup>47</sup> See Falkenmark, 1989, for a fuller description of the WCI. WCI values indicate increasing difficulty in providing sufficient water to meet all of society's social and economic needs for water. An upper limit of 1,000 does not always cause hardships, however. Depending on local circumstances a water resource may accommodate more people before crowding occurs, especially when the people have been used to low levels of water use.

<sup>48</sup> The degree of the expected water deficiency differs between the four shared water river basins. The Limpopo River basin, however, is one of most affected.

102. South Africa is the third largest exporter of coal in the world and coal is the country's second largest foreign exchange earner after gold (DEAT, 2006a: p. xix). Its economy depends heavily on fossil fuels and is one of the world's top 15 most carbon-intensive economies, making a significant contribution to greenhouse gas emissions at a continental level. Owing mainly to its growing dependence on fossil fuels for energy production, South Africa's carbon emissions have increased substantially since the early 1990s (DEAT, 2006a: p. xxi).
103. As a non-Annex I party to the UNFCCC, South Africa does not have a target and timetable obligation under the Kyoto Protocol to reduce its emissions of greenhouse gases. However, as GoSA recognizes, there are benefits to be derived from adopting a low carbon strategy that is designed to move the economy towards a more sustainable development path (DEAT: 2010a).

## **B. Borrower/Country Systems and other Relevant Bank Policies**

104. The following policies are relevant to this investigation: OP/BP 4.00: Piloting the Use of Borrower Systems to Address Environmental and Social Safeguards in Bank-Supported Projects; OP/BP 10.04: Economic Evaluation of Investment Operations; OMS 2.20: Project Appraisal; OP 10.00: Investment Lending: Identification to Board Presentation; and OP/BP 13.05: Supervision
105. The Bank's policy on the Use of Borrower/Country Systems was introduced in Chapter 1. Given that this is the first time the Inspection Panel is addressing this policy, the discussion below provides additional background and detail about this policy and the role of the Panel.

### **1. OP/BP 4.00: Piloting the Use of Borrower/Country Systems**

106. The general motivation and guiding principles behind UCS are summarized in this section, along with a discussion of the basis on which the Panel judges the Bank's compliance.

#### **a. Introduction**

107. As Management explains in the PAD, the Project was selected for application of a UCS framework because of South Africa's "*established legal and regulatory system and a favorable reputation for effective implementation of its systems governing environmental assessment and protection of natural habitats, protected areas, and physical cultural resources.*"
108. The World Bank has established several economic, financial, fiduciary, environmental, and social requirements for the projects it finances to ensure that the resources it provides are used appropriately and effectively. While these policies often have analogs in borrowing countries' institutional and legal frameworks, gaps inevitably emerge (in scope, methodology, stringency, etc.) that must be reconciled.
109. Historically, the Bank's approach to addressing these disparities was to include specific loan conditions to incorporate these policies in the design, appraisal, and implementation of the projects it financed. This approach could also include the establishment of separate implementation units somewhat independent from the

borrower's administrative structures, to facilitate project administration and execution. But while this approach expedited the project process, it also removed oversight capacity from the borrower, diminishing the opportunity to strengthen local institutions and build capacity (World Bank, 2004). Additionally, the added burden of supporting two effectively parallel administrative bodies increased the borrower's costs for World Bank projects (OED, 2003).

110. According to Bank Management, *"work done independently by the United Nations Development Programme, the Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD-DAC), the World Bank, and many other development experts led each to conclude that development can be successful only if the country itself owns the process and the government leads development efforts"* (World Bank, 2005b: p. 2). Acknowledging this, Management began to develop procedural frameworks whereby a borrowing country's systems could be used in lieu of, *inter alia*, comparable Bank safeguard policies.<sup>49</sup>

#### **b. Rationale for the UCS approach**

111. The rationale for the country systems approach was based on the following five key principles (World Bank, 2005b, p. 2-3):

**1 - Scaling up development impact.** The Bank concluded that *"it could have broader impact, well beyond the activities it funds directly, if its work more systematically strengthened the country's systems and practices themselves, and resulted in the use of improved systems for all government expenditures."*

**2 - Increasing country ownership.** Management was of the view that *"client ownership is higher when projects use the systems already in place in the country"*, and that using country systems could provide incentives both for member countries and the Bank to strengthen local laws, institutions and practices *"thus helping to ensure sustainable development impact."*

**3 - Building local capacity.** Management concluded that the use of country systems *"brings capacity building to the forefront of the interactions among borrowers, the Bank and other development partners who support the use of country systems, and thereby has immediate benefits at the project level"* and *"it can also form the basis of larger scale programs to enhance the institutional capacity of borrowers over the longer term."*

**4 - Facilitating harmonization.** The separate and different system and policy requirements for the projects financed by different development agencies in practice were seen to *"risk overwhelming the capacity of recipient countries, especially those that are highly aid-dependent, and detract from development impact."* As a result, several development agencies were then making efforts to *"harmonize"* policies widely recognized as *"good practices"* *"around strengthened country systems that incorporate them"* (World Bank, 2005b, p. 3).

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<sup>49</sup> The Bank's environmental and social safeguards policies and procedures are: OP/BP 4.01, "Environmental Assessment;" OP/BP 4.04, "Natural Habitats;" OP 4.09, "Pest Management;" OP/BP 4.10, "Indigenous Peoples;" OP/BP 4.11, "Physical Cultural Resources;" OP/BP 4.12, "Involuntary Resettlement;" OP 4.36, "Forests;" OP/BP 4.37, "Safety of Dams".



5 - **Increasing cost effectiveness.** According to Bank Management, “using country systems will also contribute to the Bank's simplification agenda, which seeks to streamline and speed up Bank procedures and processes and improve investment lending services to clients by reducing transaction costs.<sup>50</sup>” Indeed “application of a single country- or sector-level assessment to multiple projects, supplemented by additional project-specific analysis, increases efficiency in project preparation. For borrowers, there are substantial savings from using country systems instead of building and maintaining parallel structures to satisfy the requirements of the Bank (and other donor agencies)” (World Bank, 2005b, p. 4). This was a key consideration.

### c. Initial Steps and Role of Inspection Panel

112. In 2002, recognizing the importance of these principles, the Board's Committee on Development of Effectiveness (CODE) endorsed Management's incremental efforts to integrate environmental and social safeguards into country systems, without compromising the objectives and operational principles of these policies. The 2002 paper approved by CODE described a medium-term plan for introducing such use through pilots and eventually mainstreaming such approach into Bank lending.
113. Even before the UCS program was formally approved by the Bank's Board of Executive Directors in March, 2005, some projects financed by the Bank incorporated elements of this emerging approach to development finance. Among them was the Decentralized Infrastructure Reform and Development Project in Mexico, which was submitted for Board approval in May 2004 and included several features of the UCS with respect to one of the provinces executing the project. Because the World Bank Inspection Panel is charged with evaluating the Bank's compliance with its own operational policies and procedures, the then-impending UCS policy implied that several clarifications needed to be made to preserve the Inspection Panel's accountability role in the context of this project.
114. The Mexico project provided the opportunity for this clarification. A joint statement by the Chairperson of the Inspection Panel and the Senior Vice President and General Counsel (the “Joint Statement”), issued before the May 2004 Board meeting, stated that in their view the country systems strategy “*would not change the role of the Inspection Panel*” as set forth in the Resolutions establishing the Panel, and that the Panel would continue to investigate whether Management is in compliance with its policies and procedures in the design, appraisal, and implementation of projects and programs.
115. The Joint Statement further indicated that the Panel is to “*examine Management's assessment of the equivalence of the relevant Bank policies and procedures with the country system (and any additional measures agreed upon to achieve equivalence) in materially achieving the objectives of Bank policies and procedures, as well as Management's supervision of the project.*”<sup>51</sup> It also stated that “*the operational*

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50 Under the simplification initiative, as with the use of country systems, there is also more emphasis on building and using borrower capacity--and building a partnership between the borrower and the Bank--and less on Bank “policing” of individual transactions.

<sup>51</sup> “Joint Statement on the Use of Country Systems, Mexico Decentralized Infrastructure Reform and Development Project,” Chairperson of the Inspection Panel and Senior Vice President and General Counsel. R2004-0077, 0077/3. June 8, 2004.

*framework for the specific project or program agreed upon with the borrower would be the frame of reference for the borrower's performance and the Bank's supervision."*

116. The Joint Statement was discussed at the Board meeting. It reinforced the Panel's role in reviewing Management's assessment of the alignment between the policies of the Bank and those of the borrower or guarantor's laws, regulations, and policies, both as they are codified in legal terms and as they are implemented in practice. While legal language and historical performance may indicate consistency between the Bank's policies and those of the borrower, the Panel must also evaluate how Management ensures that those policies are implemented in the context of specific Bank-financed projects. These discussions confirmed that the Panel has a well defined role with regard to projects approved under this policy, including the EISP.
117. The role of the Inspection Panel is further defined in the Board paper referred to above (World Bank, 2005b):

*"52. Inspection Panel Review. If Executive Directors approve the policy framework for the safeguard pilot program, the environmental and social safeguard pilot operations would be subject to the relevant provisions of the new OP and BP rather than the provisions of the original safeguard OPs/BPs from which the objectives and operational principles in Table 1 were extracted. In the event of a request for an Inspection Panel investigation in respect of an environmental and social safeguard pilot operation, the Bank's compliance with its operational policies and procedures would be subject to Inspection Panel review to determine:*

- *"whether, with respect to the design and appraisal of the operation, the Bank correctly assessed that the borrower's laws, regulations, rules, and procedures (as supplemented where necessary by specified measures) comply with the new OP/BP applicable to the pilot;*
- *"whether the Bank had supervised the operation to ensure that it is being implemented in accordance with the new OP/BP; and*
- *"whether the Bank had failed to comply with other applicable Bank operational policies or procedures that are not affected by the new OP/BP."*

118. The basis for evaluating the Bank's compliance with its policy on UCS is the Board paper on "Expanding the Use of Country Systems in Bank-Supported Operations: Issues and Proposals" (World Bank, 2005b). Its main principles are:

- **Equivalence and acceptability.** The Bank will consider a borrower country's environmental and social safeguard system to be equivalent to the Bank's if the borrower's system is designed to achieve the objectives and adhere to the applicable operational principles set out in Table A1 of OP 4.00.<sup>52</sup>

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<sup>52</sup> OP. 4.00: para2 provides that *"the Bank considers a borrower's environmental and social safeguard system to be equivalent to the Bank's if the borrower's system is designed to achieve the objectives and adhere to the applicable operational principles set out in Table A1."* These objectives and principles reflect the Bank's environmental and social safeguard policies, including environmental assessment, natural habitats, indigenous peoples, involuntary resettlement, physical cultural resources, and others.

- **Addressing gaps.** If the borrower country has to fill gaps in its system to meet the objectives and applicable principles in Table A1 of OP 4.00 and is committed to doing so, the Bank may, when determining equivalence and acceptability, take account of measures to improve the borrower's system.
- **Borrower role and obligations.** The borrower country will be responsible for achieving and maintaining equivalence as well as acceptable implementation practices, track record, and capacity, in accordance with the Bank's assessment.
- **Bank responsibility and accountability.** The Bank will be responsible for determining the equivalence and acceptability of borrower systems, and for appraising and supervising pilot projects that use these systems (as stated in OP 4.00: para. 5).
- **Changes in borrower systems and Bank remedies.** If, during project implementation, there are changes in applicable legislation, regulations, rules, or procedures, staff will assess the effect of those changes and discuss them with the borrower. If the country system is changed in a manner inconsistent with the legal framework agreed with the Bank, the Bank's contractual remedies will apply.

119. These principles mean that during the pilot program on UCS, Management must not only assess the equivalence and acceptability of a country's environmental and social safeguard system, i.e. undertake a system-level appraisal<sup>53</sup>, but also appraise and supervise the specific project being financed, i.e. undertake a project-level appraisal in the same terms as for any other Bank-financed operation, in accordance with all applicable operational policies and procedures.<sup>54</sup>
120. To meet the requirements of OP/BP 4.00, Management developed the safeguards diagnostic review (SDR) as a tool to evaluate the strengths and weaknesses of the borrower's safeguard systems, identify targeted measures to strengthen these systems, and serve as the basis for the Bank's decisions on equivalency and acceptability with regard to the country and project in question.

#### **d. Pilot Program on UCS**

121. Between October 2004 and January 2005, Management conducted extensive consultations in more than 15 countries that included a broad range of representatives of borrowers, development partners, civil society, professional associations, and the private

<sup>53</sup> BP. 4.00: para. 2 provides that the assessment of equivalence and acceptability includes:

- "... Assessment (e.g., through discussion with experts, field visits, or interviews, as appropriate) of borrower implementation practices, track record, and institutional capacity;
- Identification of aspects of the proposed country systems that would need to be strengthened for them to satisfy the objectives and applicable operational principles set out in OP 4.00, Table A1 and of aspects of implementation that need to be improved for acceptability, and the time needed to put them in place successfully; and
- Specification of any actions the borrower is required to take to (a) achieve and maintain equivalence and (b) achieve and maintain acceptable implementation practices, track record, and capacity (...). The Bank's decision on the use of borrower safeguard systems is based on this analysis. The process involves Bank staff with appropriate policy, environmental, social, and legal expertise."

<sup>54</sup> See OP 4.00: para. 5 and footnote 4, BP 4.00: para. 4 and footnote 4.

- sector. According to Management, these consultations included discussions on the environmental and social safeguard aspects of the proposed program and draft policies. During these consultations a number of issues were raised, especially by NGO representatives, about the practical application of this new approach and its perceived potential negative effects on the Bank's commitments to sustainable development under existing safeguard policies and accountability arrangements.
122. According to Management, many of these concerns were addressed in the revised issues paper "Expanding the Use of Country Systems in Bank-Supported Operations: Issues and Proposals" (R2005-0018/2), which proposed a "pilot program" that was to run for two years and be governed by a new OP/BP 4.00, entitled *"Piloting the Use of Borrower Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects."*
  123. Management's proposal for the UCS program stated that the objectives of this new policy approach were to *"facilitate a move away from the traditional model in which safeguard and fiduciary policies are applied to only Bank-financed activities toward supporting the development and application of effective policies for all government expenditures. Key to the approach will be an increased emphasis by the Bank on capacity-building and human resource development, which can have a major multiplier effect by leading to broad improvements in the quality of government systems."* Thus, the original emphasis of this program was to improve policies, legislation and practices at the national and sub-national levels of Government.
  124. Management's issues and proposals paper was submitted to CODE and the Board early in 2005. CODE considered it in a meeting that took place on February 16, 2005 and the Board on February 24, 2005. CODE recommended the Board to support the proposed expansion of the Use of Country Systems in Bank operations as a two-year pilot program. Further developments in the pilot program for UCS are described in the Box 1 below.
  125. A further goal of the UCS policy is to encourage the development and effective application of systems in borrowing member countries that meet the objectives of Bank environmental and social safeguard policies, and *"thereby focus on building borrower capacity beyond individual project settings"* (OP 4.00: para. 1).
  126. For a proposed operation piloting the use of country systems, information on the intent to use country systems is to be made publicly available early in the project cycle and updated as project development proceeds. The process of disclosure is to begin at the project information document stage. At a later stage, but before beginning appraisal, the Bank is to make publicly available its analysis of the equivalence and acceptability of borrower implementation practices, track record, and capacity. In addition, the Bank is to ensure that relevant project-related environmental and social safeguard documents (see Table A1 of OP 4.00) are also disclosed in a timely manner before appraisal formally begins, in an accessible place and in a form and language understandable to key stakeholders.
  127. The Bank has piloted about 15 projects under the UCS framework, two of which have been located in South Africa. EISP is the first project of this nature to be investigated by the Panel.

### Box 1: Evolution of the Country System Pilot Program

In light of early experience under this Policy, Management submitted a new Report to the Board in January 2008<sup>a</sup> which recommended the expansion of the Pilot Program as follows: “on the basis of the initial pilots undertaken to date, the Bank has learned sufficient lessons to justify an incremental scaling up of the application of UCS for environmental and social safeguards, but not enough to support a move to full mainstreaming of UCS into Bank lending.” Main features of Management’s proposed approach are described below.

*“The major change in the scope of the pilot program would be the scaling up of the analytical work (SDR) to the country or subnational level rather than focusing the analysis on individual projects, and the subsequent selective application of the results (including the gap-filling and capacity building measures) to projects in those countries”* (Emphasis added).

In July of 2009, Management submitted to the Board a review of the first year of implementation of the Scaled-Up Pilot Program.<sup>b</sup> Some of the most relevant conclusions are presented below:

- “To determine equivalence, there is a need for the Bank to be flexible and look for equivalence of objectives and functions, rather than focusing narrowly on processes and outputs.”
- “During the SDR process, there is a need to work closely with national and local authorities, rather than focusing exclusively on the borrower, as well as with other donors and stakeholders.”
- “Borrower buy-in is fundamental and that takes time. Also, Bank processes for conducting this exercise should be more flexible to be able to accommodate more of our counterparts’ interests and needs in improving their systems for environmental and social management.”

<sup>a</sup> See “Evaluation of the Initial Phase of the Pilot Program for Use of Country Systems for Environmental and Social Safeguards: Lessons Learned and Management Proposal for an Incremental Scale Up of the Program”. January, 2008.

<sup>b</sup> First Year Review of Implementation of Incremental Scaled-Up Program to Pilot Use of Country Systems to Address Environmental and Social Safeguard Issues in Bank-Supported Projects, July 14, 2009.

128. The above discussion provides important context for the Panel’s approach in the present case. Given that the Project is being implemented under OP/BP 4.00, the Panel examined the Bank’s analysis of “equivalence” and “acceptability”, and reviewed the actual application of OP/BP 4.00 and other relevant Bank Operational Policies to the design, appraisal, and implementation of the Project.

129. In this context, the Panel reviewed Management’s analysis of the Medupi EIA and other Project documents, taking into consideration that these have been used by Management not only as a benchmark in their analysis of equivalence and acceptability, but also in determining compliance at the Project level. The Panel also reviewed the initial supervision documents related to the issues raised in the Request for Inspection.

## 2. OP 1.00: Poverty Reduction

130. OP 1.00 on Poverty Reduction provides that the Bank’s mission is “sustainable poverty reduction. With respect to the issue of poverty and Bank actions, it provides as follows:

*“(…) Poverty encompasses lack of opportunities (including capabilities), lack of voice and representation and vulnerability to shocks. The Bank’s support for poverty reduction is focused on actions, consistent with its mandate, to increase opportunity, enhance empowerment, and strengthen security. Within this broad*

*framework, a critical priority is promoting broad based growth, given its proven importance in reducing poverty” [OP 1.00, para. 1]*

### **3. OP/BP 10.04: Economic Evaluation of Investment Operations**

131. This policy aims to ensure that projects funded by the Bank promote the development goals of the Member country. For every investment project, the Bank must conduct an economic analysis to determine whether the project creates more net benefits to the economy than would other mutually exclusive options for the use of the resources in question; the consideration of alternatives is thus a core requirement. The economic evaluation of projects integrates financial, institutional, technical, sociological, and environmental considerations.
132. The project must be assessed with respect to economic, financial, institutional, and environmental risks. The main purpose of this analysis is to identify the scope for improving project design, increase the project’s expected value, and reduce the risk of failure.
133. A project may have domestic, cross-border, or global externalities. A large proportion of such externalities are environmental. The economic evaluation is required to include all costs that may be the result of any domestic and cross-border externalities, and also take into account global externalities as further specified in the policy itself. The analysis must consider the risks associated with the project by taking into account the possible ranges in the value of the basic variables, and must assess the economic result of the project with respect to these changes in values (OP 10.04: para. 6). All the costs and benefits, including the externalities, of a project must be considered to determine whether the project creates more economic net benefits than other mutually exclusive options (OP 10.04: paras 1, 8).

### **4. OMS 2.20: Project Appraisal**

134. This policy specifies the approach to be taken when evaluating projects for which financing has been applied. The aims of appraisal are to examine and evaluate the proposed project’s social and economic objectives, to assess whether the project is likely to meet these objectives efficiently, and to recommend conditions that should be met to ensure that the project’s purposes will be achieved. OMS 2.20 basically requires the assessment and consideration of six aspects of projects: economic, technical, institutional, financial, commercial, and sociological.
135. One of the policy’s requirements is that the economic evaluation of a potential investment identifies, quantifies, and evaluates all costs and benefits likely to be involved in the project (OMS 2.20: para. 13). The economic evaluation normally includes assessing the sensitivity of the project’s viability to changes in the key parameters of the project and, where necessary, recommends precautionary measures to reduce risks (OMS 2.20: para. 17). The objective of the Bank’s evaluation is to ascertain whether the proposed project represents an appropriate use of the country’s resources (OMS 2.20: para. 10). The Bank also should satisfy itself that the final choice among of feasible alternatives is the best from a technical and economic point of view (OMS 2.20: para. 22).

## 5. OP 10.00 - Investment Lending: Identification to Board Presentation

136. This policy provides that each investment project to be financed by the Bank must meet, *inter alia*, the following criteria:

*“(a) be consistent with the Bank's Articles of Agreement, operational policies in force, and the Country Assistance Strategy; be anchored in country policy/sector analysis; and reflect lessons learned from the Bank's experience;  
(b) be economically justified; and  
(c) contribute to poverty reduction and sustainable economic growth.”*

## 6. OP/BP 13.05: Supervision

137. This policy covers monitoring, evaluative review, reporting, and technical assistance activities. Arrangements for project implementation include the use of indicators, outcome targets, and/or results frameworks. During project implementation, progress is monitored according to indicators that are set out or referred to in the PAD and legal agreements. In this regard, BP. 4.00 provides as follows: ***“Supervision. As for any Bank-financed operation, the project results framework provides the basis for monitoring implementation and for project supervision, and Bank staff document their findings in aide-mémoire and Implementation Status and Results report”***. As stated by the Chairperson of the Inspection Panel at the time the Use of Country Systems policy was being discussed by the Board in 2004, *“In implementation and supervision, the Panel will use the country's standards as a reference point, if these are of equal or higher value than the Bank's own standards to measure Management's compliance with its own safeguard policies.”*<sup>55</sup>

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<sup>55</sup> Statement by Edith Brown Weiss, Chairperson, Inspection Panel on Use of Country Systems made at the Executive Directors' Informal Meeting of May 20, 2004, June 2, 2004.

### Chapter 3: Compliance Analysis at System Level: Equivalence and Acceptability

138. This Chapter presents the Panel's findings on whether Bank Management complied with the system-level requirements of OP/BP 4.00: Piloting the Use of Borrower/Country Systems, including in particular the requirements to determine "equivalence" and "acceptability" under that policy.
139. The Chapter begins with a review of the claims of the Requesters and the Management Response in relation to this Systems Level Analysis. It then provides background information on South Africa's environmental legal framework. The remainder of the discussion sets forth the analysis and findings of the Panel on Management's Safeguard Diagnostic Review.
140. **Requesters' claims.** The Request for Inspection for the EISP questions the adequacy of Bank Management's application of OP/BP 4.00, especially its analysis of the issue of "acceptability." The Request alleges that South Africa *"has a problematic track record of actually abiding by and implementing its environmental and social obligations"*, and that hence the Project's reliance on South African laws, policies, and institutions to implement and monitor the Project will be *"inadequate"* to protect peoples' health and well-being.
141. The Request also alleges that South African laws and standards are not equivalent to key elements of Bank policies, and that proposals to fill gaps in the legislation are inadequate, especially as they do not refer to South African laws and regulations but rather to changes in Eskom practices *"that do not appear to be mandatory, long-term improvements to Eskom's system"* (Claim No. 13).
142. **Management Response.** In its Response, Management describes the process it followed to determine the eligibility of South Africa to use its social and environmental safeguard systems for the purpose of the Project. Management states that the Bank considered a wide range of criteria, as required by OP 4.00, and *"conducted an upstream analysis, in cooperation with Eskom, the DEA and other stakeholders, and followed a consultation process involving a broad range of stakeholders in the country, on the outcomes of its analysis, which took the form of a Safeguards Diagnostic Review (SDR)"* (MR: p. v). The Response summarizes the findings of the SDR in concluding that the Borrower has the enabling legal and regulatory framework and institutional capacity to:
- "(a) conduct environmental assessment; (b) avoid, minimize, mitigate, and compensate for adverse environmental and social impacts resulting from the construction and operation of thermal power plants and associated infrastructure, while conserving natural habitat and physical cultural resources; and (c) conduct land acquisition and related resettlement activities in accordance with South African legal requirements and international good practice as exemplified by Bank safeguard policies"* (MR: p. v).
143. The Response acknowledges that enforcement of environmental and social laws in South Africa is challenging, but adds, *"[h]owever, with respect to the environmental and social safeguards triggered by the EISP, Eskom has a strong record of compliance*



as evidenced in its independently audited annual compliance reports” (MR: Annex 1, p. 33).

## A. Policy Framework

144. The basic objectives and background related to Bank policy OP 4.00 on Borrower/Country Systems are described in some detail in earlier Chapters. As indicated, OP 4.00 requires Management, *inter alia*, to assess the equivalence and acceptability of a country’s environmental and social safeguard system - i.e. undertake a system-level appraisal. Table A1 of OP 4.00 sets forth the operational principles according to which Management needs to “*assess the adequacy of the applicable legal and institutional framework.*” The Policy also contains requirements to fill any “gaps” that may be present to meet the objectives and principles of the Policy, stating:

*“If the borrower has to fill gaps in its system to meet the objectives and applicable principles in Table A1 and is committed to doing so, the Bank may, when determining equivalence, take account of measures to improve the borrower’s system. Similarly, if the borrower has to fill gaps in implementation practices and capacity to achieve acceptability, and is committed to doing so, the Bank may, when determining acceptability, take account of measures to strengthen borrower implementation practices and capacity”*<sup>56</sup> (OP 4.00: para. 3).

145. The Policy states that such measures “*are to be carried out before the borrower undertakes implementation of the relevant project activities,*”<sup>57</sup> and notes that they may be included in Bank-supported efforts to strengthen capacity, incentives, and implementation methods (OP 4.00: para. 3).<sup>58</sup>

146. **The Role of the Safeguard Diagnostic Review.** As stated above, determining equivalence and acceptability is a very complex task and for these purposes the Bank has developed a specific tool, the safeguards diagnostic review (SDR), which constitutes a key element in the processing of a project under the UCS program. The SDR is to include:

*“...desk and field work to conduct a full inventory and analysis of borrower country policies, laws, regulatory and, in many cases, judicial decisions, corresponding to the Objectives and Operational Principles of applicable and corresponding Bank safeguards as articulated in OP 4.00 Table A1. Extensive fieldwork, including site visits to Bank and non-donor funded projects, is also necessary in order to conduct a thorough and credible assessment of the Acceptability of borrower institutional capacity, processes, outputs, and outcomes”* (World Bank, 2009b: para. 2).

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<sup>56</sup> In keeping with OMS 2.20, the Panel understands the term ‘institutional capacity’ to include not only staffing issues (both skills and numbers) and training, but also management methods and techniques, organizational arrangements, planning, financial management systems and performance, operation and maintenance systems, interagency coordination, and sectoral policies.

<sup>57</sup> Some gap-filling measures related to “*less critical safeguard elements*” may be filled during implementation. See World Bank, 2008: Section V, Recommendations, para. 81.

<sup>58</sup> Insert quotation of page 35 of WB2008

147. OP 4.00 requires the SDR to be translated, accepted by the Bank, and published before the appraisal of the project in question formally begins.<sup>59</sup> In addition, BP 4.00 notes the importance of discussion with experts, field visits, or interviews as appropriate in assessing acceptability (BP 4.00, para 2).
148. Carrying out an SDR is especially challenging in countries like South Africa where there is an extensive set of laws and regulations, and where the authority to regulate and supervise activities with social and/or environmental impacts is distributed among different levels of government, from local to provincial and national. The development of new legislation or regulations, the often uneven capacities of the different authorities involved, and the sheer complexity of modern environmental and social legislation add to the difficulties of this task.

## **B. Background Facts on South Africa's Environmental Legal and Institutional Systems**

149. The discussion below is provided to give context to the Panel's analysis of whether Bank Management has complied with OP/BP 4.00, including in its assessment of equivalence and acceptability of the Borrower/Country System. It is not intended as an evaluation or interpretation of GoSA's legislation.
150. South Africa has a comprehensive environmental legal framework. The Bill of Rights of the Constitution of South Africa Act 108 of 1996 includes an environmental right that stipulates the need to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. Consequently, the State took numerous legal and other measures to forge a more efficient and effective environmental regime: promulgation of the National Environmental Management Act 107 of 1998 (NEMA) containing a set of national environmental management principles; establishment of cooperative governance mechanisms; improvement of access to information; establishment of a right to administrative action; and the codification of an extensive array of sectoral laws as part of an environmental law reform program.
151. Key milestones include the country's National Environmental Management Air Quality Act 39 of 2004, the National Environmental Management Biodiversity Act 10 of 2004, and the National Water Act 36 of 1998. The latter prioritizes the allocation of water to meet "basic human needs" and the "ecological reserve" required to maintain aquatic ecosystems; it also requires water resources to be classified and catchment management agencies to be established. Other relevant initiatives include the development of an

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<sup>59</sup> Paragraph 7 of OP 4.00 provides that "At a later stage, but prior to beginning appraisal, the Bank makes publicly available its analysis of equivalence of borrower systems and Bank requirements and its assessment of the acceptability of borrower implementation practices, track record, and capacity (including a description of the applicable borrower systems and of actions that would achieve and sustain equivalence and acceptability). In addition, the Bank ensures that relevant project-related environmental and social safeguard documents (see Table A1), including the procedures prepared for projects involving subprojects, are disclosed in a timely manner before project appraisal formally begins, in an accessible place and understandable form and language to key stakeholders."

- Energy Efficiency Strategy (2005), a White Paper on Renewable Energy (2003), and a Climate Change Response Strategy launched in 2004 (DEAT, 2006: pp. 58-60).
152. South Africa has three levels of government: national, provincial, and local. Environmental governance and pollution control are primarily concurrent functions of national and provincial government, although local government has some competence in environmental management (e.g. regarding air quality). National government has exclusive legislative competence and executive authority over mining and freshwater resources. Jurisdiction in particular environmental matters is complex and is largely dictated by the Constitution: e.g. the management of water resources as a natural resource in rivers, lakes and beneath the ground is exclusively a national competence, but the provision of water and sanitation services, which concerns the management of water in pipes or other service delivery systems, is a local government competence.
  153. The definition of “environment” in South African law (NEMA) is not limited to biophysical matters. It brings within the scope of “the environmental right” defined in South Africa’s Constitution human relationships not only with natural resources but also with cultural heritage and the urban environment (Glazewski, 2005). Likewise, “environmental” impact assessment covers socioeconomic, heritage, and natural environmental fields. In practice, the broad spectrum of issues covered by environmental management poses numerous challenges in legal and institutional coordination and integration.
  154. Subsequent sections of this Chapter refer in more detail to the laws and regulations for environmental impact assessment, including ways in which they are equivalent to, and in some cases go beyond, comparable provisions of Bank policy. One prominent environmental assessment specialist (Fuggle, 2008: p. 6) has noted significant challenges relating to the complexity of the regulations as they have evolved in the past 14 years.
  155. As suggested by the above, South Africa arguably has one of the most advanced legal environmental regimes in the world. At the same time, a 2006 analysis by the Department of Environmental Affairs and Tourism (DEAT) of the state of the environment acknowledges a gap between policy and its implementation in practice, noting that “*while policy and legislation are, broadly speaking, in place, implementation and enforcement have been inadequate*” (DEAT, 2006a: p. 82). The Department has highlighted a number of priority areas for attention in the pursuit of sustainable development: the integration of environmental considerations into policy and planning, sustaining ecosystems and using natural resources sustainably, better management of water resources, and creating sustainable human settlements (see, for example, DEAT, 2008).
  156. In 2009, several South African civil society organizations established the Centre for Environmental Rights<sup>60</sup> with the purpose to improve environmental governance and advance environmental justice and rights in the country. During its field visits, the Panel heard direct testimony from members of local communities expressing strong concerns over a lack of enforcement of legislation designed to protect against adverse social and environmental impacts from investment projects. The Panel further notes that the issue

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<sup>60</sup> Center for Environmental Rights, South Africa, [cer.org.za](http://cer.org.za).

of enforcement of environmental legislation has been raised by the GoSA and been widely researched by South African scholars, and the findings echo these concerns.

157. In particular, studies by South African scholars highlight challenges in the institutional, inter-sectoral, and legislative framework of environmental governance in the country (Paterson and Kotze, 2009: p. 111). These studies suggest that the exclusion of mining activities from the ambit of EIA law,<sup>61</sup> together with the separation of planning activities and environmental law, appear to have contributed to legal and institutional fragmentation, overlap and complexity. In an effort to address such questions, national and provincial level committees have been set up to coordinate their activities and avoid legal proceedings of constituent parts of government against one another. Nevertheless, experts point to significant challenges in decision-making processes and in having the necessary resources for post-authorization follow-up (Strydom and King, 2009: p. 18).
158. Similarly, while experts consider South African water law to be exemplary, significant issues have been raised in respect to implementation and enforcement. One South African water specialist expressed concern that South Africa is “*heading for a significant crisis in the water sector*” (Turton, 2008). Experts note that major contributors to this trend are the critical shortage of capacity within most provincial government departments tasked with implementation, the ongoing exodus of skilled staff, the lack of financial resources, and declining budgets (Strydom and King, 2009: p. 116).
159. The Panel’s expert consultant on South African environmental impact assessment notes that, in her view, the focus of regulation in South Africa during the past decade has been on EIA prior to decision making, while the monitoring of project implementation or compliance has not been adequate.<sup>62</sup> Other researchers also express concern about enforcement, until recently, of environmental laws (Paterson and Kotze, 2009), noting that recent initiatives such as the establishment of an Environmental Management Inspectorate within the national Department of Environment Affairs are addressing this concern.

### C. Management’s Safeguards Diagnostic Review

160. The remainder of this Chapter examines the Safeguard Diagnostic Review (SDR) prepared for the Project. This section gives a brief description of the SDR. The following sections provide the Panel’s analysis and findings on issues of compliance and harm in the light of OP/BP 4.00 and the claims raised by the Request for Inspection. The discussion of compliance and harm considers issues relating to the analysis of equivalence and acceptability, and the public consultation.
161. The final version of the Safeguards Diagnostic Review for the Eskom Investment Support Project (World Bank, 2010d) is dated March 11, 2010. It is a 168-page document that includes, *inter alia*, a detailed Executive Summary, a project description,

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<sup>61</sup> EIA requirements have been incorporated into mining law, but EIAs are evaluated by officials responsible for the promotion of mining; they thus act as ‘referee and player’ HA Strydom and ND King (eds). 2009. Fuggle and Rabie’s environmental management in South Africa (2nd Edition). Juta, Cape Town. P1020). Recent legal revisions aim to bring mining activities back into the NEMA regulations, but no commencement date has yet been set.

<sup>62</sup> For more on this subject, see Mosakong Management *et al*, 20 November, 2008,

a discussion about the basis for selecting the project for USC piloting, and the methodology and processes followed in determining equivalence of local legislation and acceptability of local practices of the institutions regarded as responsible for the implementation and supervision of the Project. **The Panel notes that the preparation of an SDR is a challenging and complex task and recognizes the significant work by staff to carry out this assignment.**

162. The main focus of the SDR is an equivalence analysis of the legislation related to the four applicable Bank safeguard policies: i.e. Environmental Assessment, Natural Habitats, Physical Cultural Resources, and Involuntary Resettlement. The acceptability analysis focuses, by and large, on Eskom and DEA<sup>63</sup>, with reference in particular to work and practice demonstrated in earlier Eskom projects (see below). The SDR also contains a Chapter entitled “Summary of Gaps and Proposed Gap-filling Measures,” five annexes, and three maps. The annexes include a description of the “South African Legal Framework Applicable to the Environmental and Social Impacts of the EISP Environmental Framework” and an equivalence matrix.
163. The SDR was carried out by a multidisciplinary team from the World Bank working with relevant local offices and technical staff from Eskom, with cooperation from the DEA and Department of Water Affairs.<sup>64</sup> It draws on a desk review of legislation, supporting regulations, relevant mandatory guidelines, discussions with officials, and site visits. As noted earlier, Management began its work on the SDR in late 2008 (MR: para. 26).
164. In examining equivalence, the SDR methodology built and expanded on the results of a previous SDR for an earlier, GEF-supported, project. This earlier SDR included an equivalence analysis of the South African legal framework on the four policies noted above. However, as acknowledged by the Bank, this analysis was done in the context of a very different project, one that “involved a protected natural habitat rather than an energy generation (and associated infrastructure) project” (SDR: para. 11).
165. The SDR for EISP states that it reflects and updates as necessary the findings from the SDR for the GEF-funded project “(...) *but the primary focus of the current SDR is Eskom’s corporate policies and practices, especially as demonstrated by its assessment and implementation of the Medupi and Kusile projects*” (emphasis added). In interviews with the Panel, Management noted that its review of the Medupi Environmental Impact Assessment was a significant feature of its SDR analysis, and its positive findings on acceptability gave them confidence in pursuing EISP.
166. The SDR analysis concludes that South African systems are fundamentally equivalent to the objectives and operational principles of OP/BP 4.00 relating to, *inter alia*, Bank safeguard policy on environmental assessment, and that they are “*partially equivalent*” on involuntary resettlement.<sup>65</sup>

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<sup>63</sup> Department of Environmental Affairs, formerly the Department of Environmental Affairs and Tourism (DEAT).

<sup>64</sup> According to para. 12 of the Executive Summary, “*The Bank team preparing the SDR consisted entirely of senior level staff and included an environmental lawyer, three environmental specialists, a senior technical advisor, and a social specialist.*”

<sup>65</sup> As stated in para. 11 of the Executive Summary of the SDR, “*This SDR for the EISP builds and expands on the results of the SDR completed in March 2009 for the GEF-funded iSimangaliso project, which received Board*

167. The institutional strength of the Borrower is an important premise for the overall findings of the SDR. The SDR states that “...*For the EISP, the borrower is Eskom. The gap analysis begins with the South African laws and regulations as the regulatory framework with which Eskom must comply, but the final analysis of required gap-filling measures focuses on the consistency of Eskom’s policies, procedures, and practices for its projects with respect to OP 4.00 Table A1*” (SDR: para. 63). The SDR (para. 64) concludes that there are “*a few minor ambiguities or gaps in South Africa’s legal framework with respect to the four Bank safeguard policies triggered by the EISP. However, it would appear from the analysis of Eskom’s policies and procedures that all of these gaps in the legal framework applicable to environmental safeguards are fully addressed and internalized in Eskom’s policies and practices (...)*” (emphasis added).
168. The SDR notes, however, “*two outstanding issues where there are potential gaps in Eskom’s performance with respect to the expected outcomes of the Medupi and Kusile projects*” (SDR: p. xxii). These issues relate to SO<sub>2</sub> emissions and ambient impacts on air quality and human health.
169. In respect to these issues, the SDR states that due to the short tenure of the loan agreement, “*relative to the regulatory timetable for Medupi’s compliance with the proposed South African regulations,*” the Bank would seek agreement with Eskom “*to commit to timely installation of FGD in all six units at Medupi as soon as it is technically and operationally feasible to do so (...)*” and seek subsequent reporting by Eskom on a plan and schedule for timely installation of SO<sub>2</sub> emission abatement measures. This commitment was set forth in the Loan Agreement.<sup>66</sup>

## D. Assessment of Equivalence

170. This section reviews Bank Management’s analysis of equivalence as reflected in the SDR, and whether such analysis complies with OP/BP 4.00. In doing so it highlights certain key features of national law that were in operation at the time of the Medupi EIA. These include: (a) the National Environmental Management Act 1998 (NEMA) and its environmental management principles, which are South Africa’s foundation for any decision making where the environment is concerned, as well as other legislation of direct relevance to Medupi; (b) the main requirements of the EIA Regulations, enacted in 1997, under the Environment Conservation Act 73 of 1989 (the “ECA Regulations (1997)”). As described below, these elements of national law are of central importance in relation to the claims of harm raised by the Request for Inspection, and in terms of the assessment of equivalence under OP 4.00.

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*approval in December 2009. Although the iSimangaliso project involved a protected natural habitat rather than an energy generation (and associated infrastructure) project, the SDR included an Equivalence Analysis of the South African legal framework for Environmental Assessment, Natural Habitats, Physical Cultural Resources, and Involuntary Resettlement. The March 2009 SDR concludes that the South African systems are fundamentally equivalent to the Objectives and Operational Policies of OP 4.00 Table A1 with respect to the three environmental safeguard policies, and partially equivalent with respect to Involuntary Resettlement in the context of its application to management of a designated protected area.”*

<sup>66</sup> Loan Agreement, dated April 16, 2010 entered into between the International Bank for Reconstruction and Development and Eskom Holdings, Ltd. (the “Loan Agreement”), schedule 2, para. C.2. (a).

## **1. NEMA and relevant Environmental Management Principles**

171. NEMA is founded on a set of national environmental management principles (Section 2, also referred to as s2) that apply to the actions of all organs of state in the country and provide the basis for any decision making where the environment is concerned. These principles reflect international trends in the field of sustainable development as well as country-specific challenges.
172. With specific regard to the main areas of impact of the Medupi power plant, the Panel wishes to focus on the following NEMA principles which it considers to be particularly important to the assessment and evaluation of significance of impacts and their mitigation, and to reflect the in-country expression of the Operational Principles of OP 4.00:
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.
  - The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
  - Negative impacts on the environment and on people's environmental rights must be anticipated and prevented, and where they cannot be altogether prevented, must be minimized and remedied.
  - The costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling, or minimizing further pollution, environmental damage, or adverse health effects must be paid for by those responsible for harming the environment.
  - Sustainable development requires the consideration of all relevant factors including that a risk-averse and cautious approach be applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.
  - Sustainable development requires that the development, use, and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardized.
  - Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.
  - Equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.

- Responsibility for the environmental health and safety consequences of a policy, program, project, product, process, service or activity exists throughout its life cycle.

173. In addition to the above NEMA principles, and given that water resources are crucial to Medupi, the Panel takes cognizance of the fact that the National Water Act 36 of 1998 requires that provision be made for the “reserve,” meaning “*the quantity and quality*” [emphasis added] of water required:

- to satisfy basic human needs of people who are now, or who will in the reasonably near future, be relying on, taking water from and/or being supplied from that water resource, and
- to protect aquatic ecosystems in order to secure ecologically sustainable development and use of the resource” (National Water Act 36 of 1998 s1 (xviii))

174. The Panel notes that other laws also are important in considering Management’s assessment of equivalence under OP/BP 4.00. These include the National Environmental Management Air Quality Act 39 of 2004, the National Environmental Management Biodiversity Act 10 of 2004, and the Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) and associated regulations. In this latter regard, and as noted previously, mining activities *per se* are excluded from the ambit of NEMA “*listed activities*” that trigger the requirement for EIA, and thus EIAs undertaken to inform Environmental Management Programme Reports (EMPRs) under the MPRDA are evaluated by sector officials under the requirements of that law (the MPRDA). However, mining may trigger other “*listed activities*” in terms of the NEMA, necessitating EIAs to be undertaken for those activities (e.g. clearing of more than 3ha of indigenous vegetation, activities within the 10-year floodplain of a river or stream).

## 2. EIA Regulations under the Environment Conservation Act

175. The NEMA was in place at the time that the Medupi Environmental Impact Assessment was undertaken, but the 2006 NEMA EIA Regulations were not.<sup>67</sup> Rather, the Medupi EIA was governed by the ECA Regulations (1997) under the Environment Conservation Act of 1989. These ECA Regulations were supplemented by a number of guidelines focusing specifically on their implementation (DEAT, 1998) and elaborating on “good practice” EIA more broadly in South Africa.<sup>68</sup> They effectively set a benchmark for EIA practice.
176. The EIA process prescribed by the ECA Regulations (1997) comprised two phases for those listed activities that could have “*substantial detrimental effect*” on the environment, namely a scoping phase and an EIA phase. A positive or negative decision on the proposed project—with or without conditions—could be made by the competent authority at the end of either phase.

<sup>67</sup> The importance of this matter of timing in the relevant regulatory framework is explained below.

<sup>68</sup> See DEAT 2000-04, and guidelines prepared by CSIR in 2005 for the Department of Environmental Affairs and Development Planning Western Cape, on scoping, EIA review, and environmental management plans, among other topics.



## Box 2: Environmental Impact Assessment Process under South African Law

Procedurally, the EIA process can be described as follows:

- Appoint an independent consultant to undertake the EIA process.
- Submit the application form to the competent authority.
- At the discretion of the competent authority, a plan of study for scoping may be required.
- Submit a scoping report (identify the environmental issues associated with the proposed project and the project alternatives, and provide a record of the public participation process: stakeholder lists and their comments/inputs).

If an EIA were required by the authority:

- Submit a plan of study for EIA (describe the environmental issues and alternatives identified during scoping that require further investigation and assessment, give an indication of the additional information required to determine the potential impacts, and describe the proposed method of identifying these impacts and evaluating their significance.<sup>a</sup>
- Once accepted by the authority,<sup>b</sup> conduct the EIA phase and prepare a draft EIA report (EIR).
- Make the draft EIR available for public comment.
- Submit the final EIR (for each alternative, describe the extent and significance of impacts and their mitigation, undertake a comparative assessment of alternatives, provide a record of the public participation process: stakeholder lists and their comments/inputs,<sup>c</sup> plus any media coverage, and provide any other information included in the accepted Plan of Study for EIA).

<sup>a</sup> It is considered good practice to include draft terms of reference (ToR) for specialist studies either in the Scoping Report where it is clear that further assessment of potential impacts will be required, and/or in the plan of study for EIA, to give the competent authority and stakeholders the opportunity to request amendments to or refine these ToR to ensure an adequate EIA. See for example Munster, 2005.

<sup>b</sup> The relevant authority may request the applicant to make the amendments to the plan of study that the relevant authority requires to accept the plan. Once accepted, the plan of study constitutes a legal document with which the EIR must conform.

<sup>c</sup> An "Issues Trail" is a way of tracking the key environmental issues raised during Scoping and in comments on the draft EIR, to show that (and how) they have been addressed in the final EIR. Synonymous with a "Comments and Responses report", the key issues are summarized thematically, a response to comments is given and the reader is directed to the particular section in the final EIR that addresses the comments.

177. The Bank's OP 4.00 requires that a "screening" process be used to determine as early as possible the extent and type of impact assessment that is needed, so that appropriate studies can be undertaken proportional to potential risks and impacts. In South Africa, where the need for impact assessment is triggered by law through "listed activities," scoping (as described above) is used to determine the extent of impact assessment and appropriate studies (i.e. is synonymous with screening) and is given great importance in the regulatory framework (DEAT, 2002a).<sup>69</sup> This step in the process defines the scope of studies needed in the EIA, including:

- the boundaries of the EIA;
- potentially significant impacts and risks, and thus the specialist studies required; and
- the range of alternatives that should be addressed.

### 3. Support for Conclusions on Equivalence

178. Management has concluded that South Africa's regulatory system was broadly consistent with the objectives and applicable operational principles set out in Table A1 of OP 4.00. The Panel notes that this conclusion on broad equivalence is supported at a

<sup>69</sup> Appropriate scoping is key to ensuring adequate quality in the EIA.

number of legal and regulatory levels. With respect to objectives and operational principles on environmental assessment, the Panel observes that:

- The intention of both OP 4.00 Table A1 (Environmental Assessment) and current South African legislation (particularly s2 of NEMA) is to integrate the consideration of environmental, socioeconomic, and cultural heritage impacts into decision making, taking into account: direct, indirect, and cumulative impacts; trans-boundary and global concerns; links between social and environmental attributes, and cultural heritage; and potential impacts on human health and safety.
  - OP 4.00 requires measures to prevent, minimize, or compensate adverse impacts; NEMA similarly requires measures to avoid, or minimize and remedy, adverse impacts (s2 of NEMA).
  - OP 4.00 Table A1 and the ECA Regulations (1997) emphasize the assessment of feasible alternatives<sup>70</sup>; “alternatives” in South Africa include options for development sites, layouts, designs, processes, technologies, and materials (DEAT, 1998) but not necessarily capital and recurrent costs which, as noted in the SDR, are considered by Eskom in practice (SDR: para. 23, p. 9).
  - Both OP 4.00 Table A1 and South African law require studies of impacts at a level of detail appropriate to their potential significance and/or risks.
179. The Panel further notes that Table 1 of the SDR for the Project provides a good description of the laws affecting land acquisition and resettlement. In addition, Annex 3 of the SDR covers the main elements of the Constitution of South Africa and the National Environmental Management Act 107 of 1998, the National Environmental Management (NEM) Biodiversity Act 10 of 2004, the National Heritage Resources Act 25 of 1999 (NHRA), the NEM Waste Act 59 of 2008, and the NEM Air Quality Act 39 of 2004, which correspond to the Objectives of OP 4.00 Table A1.
180. The Panel has reviewed the SDR and related documentation and considers Management’s assessment that South African laws, policies, and practices are designed to achieve the objectives and adhere to the applicable operational principles laid out in Table A1 to be well-founded, taking into account the gaps addressed in the SDR. **The SDR, contains a detailed review of the Guarantor’s and the Borrower’s legal and regulatory framework and practices. The Panel finds that, in most respects, Management’s analysis of equivalence complies with OP/BP 4.00. As described below, however, the Panel found certain shortcomings in the SDR analysis, which raise issues of compliance.**

#### 4. Shortcomings in Equivalence Analysis

181. The Panel has identified, nevertheless, three different types of shortcomings in the SDR equivalence analysis. The first relates to the determination of the relevance of the legal framework at the time the Medupi EIA was undertaken. The second relates to significant laws and aspects of legal provisions which were not adequately assessed. The third relates to the degree of reliance on Eskom’s internal policies and procedures to address what the SDR refers to as “*minor ambiguities or gaps*” in equivalence.

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<sup>70</sup> R1182 of EIA regulations, 5 September 1997, in terms of the Environment Conservation Act 73 of 1989.

182. **Legal Framework applicable to the Medupi EIA.** In the present case, the Bank was carrying out the SDR analysis after the Project EIA had already been prepared and construction of the Medupi Power Plant was “*well underway*” (SDR, para 7, p.vii). This has raised an issue of timing in terms of the equivalence analysis. As noted previously, OP 4.00 states, *inter alia*, that any needed gap filing measures “*are to be carried out before the borrower undertakes implementation of the relevant project activities.*”
183. In this context, in examining equivalence, the Bank needs to consider changes in the applicable legal framework between the time the Project was originally developed (and Project safeguard documentation was prepared), and the time when the Bank carries out the SDR. This is important because any gaps or lack of equivalence in the legal framework at the time that a project is originally developed may be reflected in the project’s EIA and other safeguard documents. If so, this ought to be identified by the Bank through the SDR, together with actions needed to address any such gaps.
184. The Panel notes, however, that the SDR Equivalence Matrix did not reference the regulatory situation relevant to the Medupi EIA when it was undertaken. As noted above, the Medupi EIA was governed by the ECA Regulations (1997). The equivalence analysis in the SDR, however, refers to the NEMA EIA Regulations of 2006 as regulations that “*describe the current state of the country system*” (SDR: p.112, footnote 2). The SDR further notes that “*...the EIA process and EIR content for both projects was strongly influenced by and is essentially consistent with the EIA Regulations that became effective in July 2006, even though they were not legally applicable to the Medupi and Kusile projects*” (SDR: para 22).
185. This is more than just a technical point. Unlike the 2006 EIA Regulations, the ECA Regulations (1997), which were applicable at the time of the preparation of the Project, did not require applicants to address cumulative impacts and prepare and submit an environmental management plan with the EIR (See OP 4.00, Table A1, paragraph A1 and A6). **Contrary to Management’s statement that previous drafts of the 2006 EIA Regulations “clearly influenced the content and format of the EIRs that were submitted and approved” (SDR: Annex 2), no such evidence of the draft 2006 EIA Regulations having influenced the scope or content of the Medupi EIA could be found.** On the contrary, the Medupi EIR states clearly that it is being undertaken in terms of the ECA Regulations (1997).<sup>71</sup>
186. The fact that the 2006 EIA Regulations were not in effect when the Medupi EIA was prepared raises important issues about Management’s findings of equivalence in respect to key related principles contained in Table A1 of OP 4.00. As described in Chapter 4, the Panel has identified important shortcomings in Management’s analysis of Project safeguard documents on, among other points, precisely these issues of assessing cumulative impacts and environmental management planning.
187. The Panel further notes that the statement in the SDR that “*NEMA requires that cumulative impacts be considered both in the EIA process and by decision-makers*” is at best incomplete. Although such a requirement was contained in s24(7) of the NEMA as

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<sup>71</sup> The EIR states that “*The new EIA Regulations are currently in draft form and not yet promulgated. This project is being undertaken under the current Regulations in terms of the Environment Conservation Act*” Medupi EIR, Appendix 1a, p. 168.

enacted in 1998, it was not present in the NEM<sup>72</sup> Amendment Act 8 of 2004 that was in force at the time of the Medupi EIA, and thus was not applied to the Medupi EIA. Furthermore, there is no mention of cumulative impacts in the NEMA principles. The requirement to address cumulative impacts reappeared in the 2006 EIA Regulations<sup>73</sup>; however, as noted previously, these were not yet in force at the time of the Medupi EIA.<sup>74</sup>

188. **The Panel finds that the SDR did not adequately recognize the gap between Bank Policy requirements and prevailing national legislation with respect to assessing cumulative impacts and environmental management planning in the EIA process at the time that the Medupi EIA was prepared, as required by Table A1 of OP/BP 4.00.** While this lack of equivalence subsequently was addressed through the enactment of the current EIA Regulations (2006), the absence of these requirements in the regulatory framework at that time may have contributed to certain omissions in the EIA analysis which are of considerable importance to a number of claims in the Request for Inspection. This is considered in more detail in Chapters 4 and 5.
189. **Assessment of applicable laws and legal provisions.** The SDR describes most of the legislative provisions of relevance to the Project. It also makes references to the National Water Act but this Act is not included in the Equivalence Matrix (SDR: Annex 3). The Panel considers that a more detailed consideration of this law would have been appropriate in the present context. Water is South Africa's most limiting natural resource, underpinning the provision of ecological services, human health and wellbeing, and the integrity of natural freshwater systems. The National Water Act (1998), with its spectrum of provisions protecting both human and ecological needs, has a direct bearing on assessing equivalence under OP 4.00, both in terms of environmental assessment and natural habitats.
190. In addition, although the SDR refers to the Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) and associated regulations, it provides little or no analysis of its provisions. This is particularly important in this Project. As discussed in Chapter 5, a number of important socioeconomic, health and environmental impacts of the Project arise from the expansion of mining at the Grooteegeluk Mine to supply Medupi. This mining activity is covered by the MPRDA but the SDR does not adequately examine the equivalence of the environmental and social aspects of this law with Bank policy.
191. Medupi also raises significant questions of social and environmental impacts both at the local and regional levels. While the SDR contains a rather detailed review of the legal framework and the policies and practices of Eskom, in this context it would have been important to refer to Integrated Development Plans (IDPs) and associated spatial

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<sup>72</sup> NEM is a prefix used for specific Acts promulgated in terms of the NEMA, e.g. NEM Biodiversity Act.

<sup>73</sup> As noted in the SDR (Annex 3, p. 93), the 2006 NEMA EIA regulations (R385) state that “‘cumulative impact’, in relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.”

<sup>74</sup> It should also be noted that neither the NEM, the NEM Amendment Act of 2004, nor the ECA Regulations define “associated” facilities, activities, or impacts. The 2006 NEMA EIA Regulations (R386), however, provide a legal definition, of “associated structures or infrastructure” as “any building or infrastructure that is necessary for the functioning of a facility or activity or that is used for an ancillary service or use from the facility.”

development frameworks (SPF) under the Municipal Systems Act 32 of 2000<sup>75</sup>; and the provisions of the NEM: Air Quality Act 39 of 2004 that require municipalities to prepare air quality management plans as part of their IDPs.

192. Finally, the Panel notes that at the time of the Medupi EIA and the preparation of the SDR there was no formal requirement under South African law for “*independent advisory panels*” to be used “*during preparation and implementation of projects that are highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns*” (OP 4.00: Table A1, para. 8). The SDR refers to the existence of “Environmental Assessment Practitioners” as an equivalent requirement in local law<sup>76</sup> but a review of the applicable legislation shows that such equivalence does not exist because the role and functions of such Environmental Assessment Practitioners is significantly different than the one required of “*independent advisory panels*” by OP 4.00.
193. **The Panel finds that the SDR does not provide an adequate analysis of equivalence in respect to laws related to water use and mining activities which are of relevance to this Project. The Panel further finds that the SDR does not adequately assess the lack of provision in South African law to use an independent advisory panel during preparation and implementation of projects that are “*highly risky or contentious or that involve serious and multi-dimensional environmental and/or social concerns*,” which is an operational principle set forth in Table A1 of OP 4.00 (para A.8). In these respects, the SDR analysis falls short of the requirements of OP/BP 4.00.**
194. **Assessment of “minor” gaps or ambiguities.** As noted previously, Bank Management identified certain minor gaps or ambiguities in equivalence in the areas of environmental assessment, natural habitat and cultural resources. In this regard, Management stated that “*it would appear from the analysis of Eskom’s policies and procedures that all these gaps in the legal framework . . . are fully addressed and internalized in Eskom’s policies and practices,*” (SDR, paragraph 64) with the exception of some aspects of involuntary resettlement. **The Panel notes the institutional strength of Eskom, but is concerned about this degree of reliance on self regulation by the Project sponsor in determining equivalence.**

## **E. Assessment of Acceptability**

195. To assess acceptability, the SDR considered the institutional practices, track record, and capacity both of Eskom and of the South African regulatory system (focusing essentially on the Department of Environmental Affairs).<sup>77</sup> In this context, it examined the EIA

<sup>75</sup> The Municipal Planning and Performance Regulations 2001 in terms of the Municipal Systems Act 2000 require a strategic environmental assessment of the SDF.

<sup>76</sup> As noted in the SDR, the NEM Amendment 8 of 2004 provides that the Minister or Member of the Executive Council (MEC) may appoint an external specialist where the technical knowledge required to review any aspect of an assessment is not readily available within the competent authority and/or where there are doubts about objectivity of information; s24l of NEMA, as amended. NEMA, as amended, also provides that EIAs or other specified tasks related to environmental authorizations may only be performed by Environmental Assessment Practitioners. These functions, however, are not equivalent to those of the independent advisory panels as called for by OP 4.00.

<sup>77</sup> The SDR describes the functions of two other departments, the Department of Water Affairs and the South African Heritage Resource Agency, but does not evaluate their capacity.

process and outputs for Medupi and Kusile power plants<sup>78</sup>, two “nationally important projects” already under construction, as well as a number of smaller Eskom projects under the requirements of OP. 4.00. In particular, the SDR indicates that by:

*“selecting these two nationally important projects as the primary subjects of SDR analytical work for the EISP, the Bank achieves two important objectives: it allows the SDR to assess the integrity and robustness of DEA’s environmental review and approval process for two major projects that could be considered of national importance; and it provides insights into Eskom’s capacity, commitment, and capability to address environmental and social safeguards issues with respect to both the EIA process and project implementation, since construction is well underway for both the Medupi and Kusile power plant projects. Moreover, this focus on these two key projects is a particularly valuable approach because both the safeguards work and the initial stages of construction have been carried out in accordance with Eskom’s corporate practices prior to the decision by the GoSA to seek Bank support for Eskom’s investment program.”* (SDR: para. 7).

196. The SDR concludes that a detailed review of Eskom’s policies and procedures with respect to the four triggered safeguard policies, *“and as demonstrated by the planning and implementation of the Medupi and Kusile projects to date,”* indicates *“a high level of consistency with international good practices”* (SDR, para. 69).
197. The following sections review Bank’s Management’s analysis of acceptability as reflected in the SDR and whether such analysis by Bank Management complies with OP/BP 4.00. In doing so, the Panel has identified two different types of shortcomings in the SDR acceptability analysis. The first relates the institutional capacity for environmental management and the SDR’s focus on Eskom’s self-regulating capacity, and the second relates to the use of the Medupi EIA as a measure of acceptability at the systems level.

#### **1. Assessment of Institutional Capacity for Environmental Management**

198. The Requesters raise concerns about capacity as a key element of their claim with respect to the use of Borrower Systems for the Project.<sup>79</sup>
199. The Panel notes that the requirement to assess technical and institutional capacity as part of the SDR analysis of acceptability is an important element of the policy framework

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<sup>78</sup> The SDR (para. 7) states that *“for purposes of assessing the implementation practices, track record, and institutional capacity of Eskom and the South African regulatory institutions that will be involved in addressing environmental and social safeguard issues in the proposed Bank-supported EISP, the Medupi Power Plant and another major Eskom investment currently under construction, the 4,800 MW Kusile power plant in Mpumalanga Province, were selected by the Bank team to assess and verify the robustness of the Environmental Impact Assessment (EIA) process and its outputs under the requirements of OP 4.00.”* The EIRs for the Sere Wind Power Project, the Upington CSP Plant, the proposed coal transport railway between Ermelo and the Majuba Power Station, and the various transmission lines that will connect the Medupi Power Station to the national grid, were also reviewed.

<sup>79</sup> See para. 18. of the Request for Inspection: *“we believe the Bank’s analysis that South African institutions can adequately monitor and implement national laws and protect peoples’ health and well-being is incorrect; South Africa has a problematic track record of actually abiding by and implementing its environmental and, social obligations.”*

under OP/BP 4.00, outlined above.<sup>80</sup> The requirement to consider issues of capacity is also an important element of OMS 2.20 on project appraisal.<sup>81</sup>

200. The SDR for EISP focuses mainly on the capacity of Eskom, the Borrower, and contains a comprehensive analysis and evaluation of Eskom's widely recognized institutional capacity. As noted in the SDR and PAD, Eskom's capacity, environmental management systems, and track record are generally good. Readiness audits were conducted for Medupi in January 2011, and some parts of Eskom's business have been certified under ISO 14001.<sup>82</sup>
201. However, incidents of non-compliance do occur.<sup>83</sup> Self-regulation of industry through monitoring and measures such as the establishment of an Environmental Monitoring Committee and the appointment of an Environmental Control Officer on the Medupi site may reduce, but not remove, the need for compliance monitoring by competent authorities.<sup>84</sup>
202. In reviewing the SDR, the Panel notes that the capacity for environmental management entails not only the borrower's capacity but also capacity within the competent authorities to review EIAs, issue robust decisions with enforceable conditions, and monitor and enforce compliance with those conditions. As suggested above, self-regulation of industry does not remove the need or responsibility for compliance monitoring by competent authorities. There is, moreover, evidence in many countries that context-specific characteristics such as the political system and the capacities of the key stakeholders are insufficiently considered in the evaluation of EIA system performance, and that greater attention to these issues improves the outputs, outcomes, and usefulness of EIAs (Kolhoff, Runhaar, and Driessen, 2009).
203. In this context, Eskom's institutional capacity alone will not give assurance of desired outcomes. Eskom appointed an independent consultant to undertake the EIA, and the then-Department of Environmental Affairs and Tourism (DEAT; now the Department of Environmental Affairs) issued the Record of Decision (RoD) on the Project, which specifies associated conditions. A range of different authorities from national, provincial, and local government are responsible for checking and enforcing compliance. In light of the above, the Panel considers that Management's statements in the SDR and in the PAD that all "...gaps in the [South Africa's] legal framework applicable to environmental safeguards are fully addressed and internalized in Eskom's

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<sup>80</sup> See also footnote 24 on the definition of country systems under OP 4.00.

<sup>81</sup> OMS 2.20 (para.25) provides that the Bank's project appraisal renders a judgment on "*the competence of the borrower's technical staff and its consultants, if any, to design and execute the project, and to ensure its proper operation and maintenance.*" In this context, OMS 2.20 points to the policy concern that it is not sufficient, as a policy matter, to rely on the reputation of a borrower or its technical staff, stating that "*...even though the reputation of the borrower's technical staff and consultants may be good, Bank experience suggests that a thorough review of all technical aspects... should be a normal procedure*".

<sup>82</sup> Management Response email, July 11th, 2011.

<sup>83</sup> In 2009-10, for example, there were 55 environmental legal contraventions by Eskom (Eskom Integrated Report 2010. [http://www.eskom.co.za/annreport10/fact\\_sheets/manage\\_env.htm](http://www.eskom.co.za/annreport10/fact_sheets/manage_env.htm) (accessed 11/9/10)). Particulate emissions control and water use are areas recognized for poor performance; opportunities exist to "*expand on water conservation programs.*" The SDR (para.73) noted that from 2007-08, 96 environmental legal contraventions were recorded, most of them relating to unauthorized releases of process and wastewater.

<sup>84</sup> Self-regulation of social/environmental impacts has been advocated as a solution to the regulatory capacity problems faced by developing states. But government action remains vital to effective regulation. See for example Graham and Woods, 2005.

*policies and practices*” (PAD, Annex 11, para.64 and SDR, para. 64), is not a sufficient response to issues of regulatory capacity and oversight of implementation.

204. Beyond Eskom, the SDR discussion of national authorities is limited to the Department of Environmental Affairs and Tourism (DEAT), Department of Water Affairs (DWA, formerly Department of Water Affairs and Forestry, DWAF), and the South African Heritage Resources Authority (SAHRA). The capacity of these authorities is simply described in the SDR rather than evaluated. The capacity of key agencies such as the Department of Mineral Resources (DMR, formerly Department of Minerals and Energy) and the Department of Energy is not addressed. Further, although the SDR recognizes the fact that environmental management is a concurrent responsibility of provincial- and national-level authorities and in some instances (e.g. regarding air quality) may be delegated to district municipality level, it does not include an institutional assessment of the relevant authorities involved in the Project.
205. Government departments and a spectrum of other stakeholders have highlighted the government’s limited capacity--to review EIAs, draft robust authorizations, and monitor and enforce compliance--as a major constraint on the acceptable implementation of the Project. According to various expert opinions, all tiers of government within South Africa’s environmental authorities regularly experience constraints on their capacity and resources (Strydom and King, 2009; Malungani and Mongwe, 2010; DEAT 2006). In particular, provincial environmental budgets are limited and staff is heavily overcommitted.
206. The identification of institutions to oversee environmental management also needs to be discussed. Bank Management’s view appears to be that the Medupi Power Plant is a project of national significance and thus technical competence is essentially to be considered at the national level within the environmental authority.<sup>85</sup>
207. The Panel notes that National government is responsible for decision making on the EIA for Medupi. However, environmental management inspectors (EMIs) at the national and provincial (Limpopo) and/or the local authority level act as enforcement officers for the National Environmental Management Act 107 of 1998 (NEMA) and for specific environmental management acts<sup>86</sup> as well as for any authorizations issued under that legislation—including permits, licenses, and EIA authorizations/RoDs. Responsibility for air quality management may be delegated to local authority EMIs. The national environmental authority, although falling under the same ministry as the Department of Water Affairs, is not responsible for regulating water matters, management, or compliance enforcement. The Department of Mineral Resources has limited capacity for enforcing environmental compliance at mines.<sup>87</sup> Both the Department of Water Affairs

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<sup>85</sup> The Panel notes, in this regard, that Management largely limited its analysis in the SDR process to DEAT and National Treasury, and to some limited extent, the national Heritage Resources Agency and DWA. This was also confirmed in interviews with Management.

<sup>86</sup> NEM: Biodiversity Act, 10 of 2004; NEM: Protected Areas Act, 57 of 2004; and NEM: Air Quality Act, 39 of 2004.

<sup>87</sup> For example, due to their capacity limitations, most regional offices managed fewer than 50% of inspections (March 2007). Department of Minerals and Energy (DME), Annual Report 2006-07. This figure has improved in subsequent years (e.g. marginally under targets in 2008), although a Report of the Auditor-General to Parliament on a performance audit of mine rehabilitation (October 2009) noted the current insufficiency of human resources as “an issue of concern.”



and the Department of Mineral Resources are “severely under-resourced in relation to compliance monitoring and enforcement.”<sup>88</sup>

208. Experts and officials consulted by the Panel observe that there are significant capacity constraints on checking and enforcing compliance with air quality (and other) legislation within all tiers of government. The Panel was told during its visits by the Requesters and other stakeholders that “government capacity is always an issue.”
209. Without exception in Panel interviews, national, provincial, and local authorities tasked with monitoring and enforcing compliance noted the lack of sufficient capacity to undertake these tasks effectively or efficiently. In the words of one official, “*there are not enough soldiers.*” All authorities spoke of high staff turnover that exacerbated capacity problems. Annual turnover rates of staff at the national level, for example, have reached 21% among so-called “*regulatory inspectors, permanent*” (DEAT: 2009-10). There are serious capacity constraints at all tiers of government within the environmental and water authorities<sup>89</sup>. The provincial environment department, a key commenting authority, spoke of inadequate capacity to review the Medupi Power Plant<sup>90</sup> and associated EIA processes (e.g. sand mining applications).
210. According to a recent study on the EIA system, “*government (national and provincial) has not allocated adequate human and material resources to make the environmental legislation work, and the high turnover of staff of competent authorities means that institutional capacity to effectively and efficiently implement EIA remains low despite efforts to train and capacitate officials.*”<sup>91</sup> The number of environmental management inspectors (EMIs) in Limpopo Province dropped from 20 to 14 from 2007/8 to 2009/10 and these inspectors fall into the “*administrative*”<sup>92</sup> rather than “*professional*” staff category. Their counterparts in the national department increased from 48 to 57, but there is a 21% annual turnover rate among permanent regulatory inspectors (DEAT, 2009/10a). Compliance monitoring and evaluation is neither effective nor efficient<sup>93</sup>; the SDR notes that this area is recognized by DEA as one “*for overall improvement,*” but that energy generation sectors have been largely compliant (SDR: para.134). The capacity and ability of local government to implement and provide environmental services were found to be “*almost non-existent in most districts*” (DEAT, 2010b). The recent increase in numbers of EMIs has enabled more frequent site inspections and these

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<sup>88</sup> Executive Director, Centre for Environmental Rights, Joint media release: “*NPA decides to prosecute mining company for violating environmental laws,*” 22 February, 2011. [www.cer.org.za](http://www.cer.org.za). NPA is the National Prosecuting Authority.

<sup>89</sup> Generally, there has been a decrease in baseline budget allocation to the Department of Environmental Affairs, as well as a decrease in donor funding (Parliamentary Monitoring Group, 25 January 2011). The Department of Water Affairs has fewer than a third of the staff it needs to enforce water quality and pollution laws, according to the Minister of Water and Environmental Affairs in a response to a Parliamentary Question, 24 November 2010. The Department of Water Affairs faced numerous challenges in implementing some of its strategic goals, including a shortage of dedicated technical personnel. Its inability to successfully address all identified compliance cases was due to shortage of suitable personnel to carry out the functions successfully; the inability to finalize all water use license backlogs was also due to capacity constraints; the Department’s water pollution policies were not as efficient as they could be, but were a reflection of the capacity issues affecting the Department. Parliamentary Monitoring Group, 27 October 2010.

<sup>90</sup> The provincial environment authority submitted an appeal on the Record of Decision.

<sup>91</sup> Mosakong Management *et al*, 20 November, 2008.

<sup>92</sup> EMIs perform a range of duties such as issuing compliance notices to inspection, conducting investigations, enforcement, giving evidence in court, etc. Administrative duties would primarily include issuing notices.

<sup>93</sup> Mosakong Management *et al*, 20 November, 2008.

are revealing “not only how inadequate the actual self-monitoring has been in South Africa, but also how frequently industry has failed to comply with self-monitoring and reporting requirements” (Paterson and Kotzé, 2009: pp. 50-51).

211. **The Panel finds that the analysis of acceptability in the SDR did not adequately address the institutional capacity of key regulatory institutions involved in environmental monitoring and management related to EISP, particularly at the provincial and local levels. The focus was mostly on Eskom and DEAT. This does not comply with OP/BP 4.00.**

## 2. EIA Practices and Use of the Project EIA in the SDR

212. As noted previously, the acceptability analysis under OP/BP 4.00 requires an assessment of implementation practices and track record in addition to institutional capacity. In reviewing “acceptability” aspects of EIA practice in the country, the SDR refers to a report by DEAT indicating that performance over the years had been “moderate” and that there was “substantial room for improvement” (SDR: p. 29). The SDR (p. 28) also notes the shortcomings of the ECA Regulations (1997) under which the Project EIA was carried out. Although the SDR describes these concerns, it does not identify them as “gaps” or suggest feasible actions to address them.
213. In reflecting on EIAs conducted in South Africa, a leading environmental academic has observed that their quality is highly variable: “in South African Environmental Assessments, procedural detail has become more important than the quality and substance of the Assessments” (Fuggle, 2008). Independent studies further indicate that the quality of authority review of EIAs is highly variable.<sup>94</sup> Significant issues include capacity constraints within the environmental authority to review not only the process but also the substance of EIAs to ensure adequacy, as well as tensions within South Africa’s environmental decision-making context.<sup>95</sup>
214. A recent review of EIA documentation from case studies on electricity generation projects showed that the quality varied from “good” (50%) to “poor” (37%), and that the consideration of alternatives, indirect and cumulative impacts, and the minimization of negative impacts was “poor.”<sup>96</sup> The Panel notes that these concerns are, to some extent, reflected in the EIR for Medupi (see Chapters 4 and 5 of this report) and should have been properly reflected and addressed in the SDR. In this regard, the Panel’s expert notes that in light of these systemic considerations, the need for independent review for

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<sup>94</sup> See, for example, Mosakong Management *et al*, 20 November, 2008, noting, *inter alia*, that the assessment of cumulative impacts in South Africa is “generally not considered effective and there is significant room for improvement”.

<sup>95</sup> For example King and O’Beirne, 2006 note that “Increasing trade-off of environmental components to allow for increasing economic ‘growth’ is undermining any chance of moving onto a sustainable footing.” Interviewees and sources of information point to lack of cooperative governance, conflicting mandates, and fragmented responsibility for environmental management between authorities; “cooperative governance” makes it difficult for departments publicly to record differences in position or be seen to disagree or dispute issues; there is an overriding imperative for economic growth and job creation in the short term that takes priority over environmental and social safeguards in many instances.

<sup>96</sup> Mosakong Management *et al*.

quality assurance of complex or controversial EIAs has been recognized in South Africa.<sup>97</sup>

215. The Panel appreciates the methodological value of using the documentation and process of existing EIAs as a measure of the track record and actual performance by the Borrower and regulatory agencies in implementing the applicable legal framework. The Panel also appreciates the methodological challenges in finding relevant and recent examples of environmental assessments of coal-fired power plants in South Africa.<sup>98</sup>
216. As noted above, however, the Panel's analysis shows that the EIA that was prepared for Medupi has certain shortcomings as compared with the relevant policy framework. This analysis brings into question Management's view of it as a significant positive indication of "acceptability" for purposes of the SDR analysis.
217. OP/BP 4.00 is explicit in requiring the Bank to confirm that the environmental and social safeguards analyzed in the SDR are acceptable to it, and that the SDR is disclosed before appraisal formally begins, which was done.<sup>99</sup> The Panel notes that the team did use several means to assess acceptability, in line with Bank policy.<sup>100</sup> However, it appears that the Medupi EIA was used as a significant benchmark to evaluate the system-level acceptability of the Borrower's system, putting a premium on analysis of an existing project that Bank Management is considering to finance.
218. The Panel considers that Management's use of the Medupi EIA to evaluate "acceptability" introduces a potential overlap between what, in the present report, is labeled "system-level" and "project-level" analysis. Having found the Borrower's system acceptable at the system level using the EIA as a relevant benchmark, it becomes difficult to critique the same EIA objectively when it is the subject of appraisal at project level.<sup>101</sup> This may have affected Management's due diligence analysis of the EIA.
219. Key challenges arise when the Bank chooses to support a project after the project is underway and after key policy-required analytical documents and related actions have been developed. The Panel notes in this regard that by the time the Bank became engaged in this process in 2008, it was structurally more difficult to develop measures to correct for flaws in the EIA process or decision, and options to change the scope of mitigation/compensation were limited—though some could have been introduced by the Bank as a specific condition for the Project.

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<sup>97</sup> For example King and O'Beirne, 2006. In this context, the development of a voluntary certification system for EIA practitioners underlines concerns about - and the need for - improved quality assurance. The Interim Certification Board for Environmental Assessment Practitioners is supported by 15 professional bodies and state departments, bound by the need for quality assurance in EIA. <http://www.eapsa.co.za/home.html>

<sup>98</sup> The PAD (Annex 6, para 3, p.131) notes "*Eskom realized at the outset of the new build program which includes coal-fired power plants among others that a shortage of skills and knowledge existed both within Eskom and South Africa.*"

<sup>99</sup> The PAD states that a draft of the SDR was publicly disclosed on November 11, 2009. PAD, paragraph 289.

<sup>100</sup> BP 4.00, para. 2 provides examples of other ways of determining acceptability when it states "*Assessment (e.g., through discussion with experts, field visits, or interviews, as appropriate) of borrower implementation practices, track record, and institutional capacity.*"

<sup>101</sup> BP 4.00, para. 3 provides that as part of its due diligence, Bank Management is required to confirm that the EIA is acceptable to the Bank, i.e., consistent with Bank policy.

220. **Panel Findings.** The Panel notes that the EIA for Medupi had already been authorized and completed by the time Management began preparing the SDR and appraising the Project. It is the Panel's view that this may have further compromised the Bank's ability to influence outputs and outcomes under the Project as needed to ensure compliance with Bank policies. The framework and criteria against which to evaluate Project performance had largely been defined through the process leading to the Medupi EIA (completed in May 2006) and subsequent Record of Decision on the project (September 2006).
221. **The Panel finds that the SDR does not adequately reflect concerns relating to implementation practices and track record in regard to the EIA process, nor suggest feasible actions to address them, other than relying essentially on the capacity and practices of the Borrower. This is not consistent with OP/BP 4.00.** The Panel also notes with concern the difficulties in using the Project's EIA as a significant benchmark for Management's analysis of acceptability in the present circumstances.
222. As noted previously, OP 4.00 contains requirements to identify and fill "gaps" that may be present, in order to meet the objectives and principles of the Policy with respect to issues of equivalence and acceptability. These requirements include the need for the borrower to undertake measures to strengthen implementation practices and capacity and "...may include Bank-supported efforts to strengthen relevant capacity, incentives, and methods for implementation" (OP 4.00: para. 3).
223. Due to certain shortcomings in its analysis of institutional capacity and implementation practices, as described above, **the Panel finds that Management did not have an adequate basis to properly identify gap-filling measures to help address issues of capacity within competent environmental authorities at certain tiers of government to, inter alia, review EIAs, draft robust authorizations, and monitor and enforce compliance. This is not consistent with OP 4.00.** The Panel considers that relying mostly on the institutional strength of Eskom was not a sufficient response to address these important and well-documented concerns relating to institutional capacity related to environmental authorization and enforcement.

## F. The Process of SDR Preparation

224. BP 4.00 requires that the scope of the Equivalence and Acceptability Analysis should include an "*Assessment (e.g., through discussion with experts, field visits, or interviews, as appropriate) of borrower implementation practices, track record, and institutional capacity.*" (BP 4.00, para. 2).<sup>102</sup>
225. The Panel notes that Management held two half day consultation sessions at the Bank Country Office in Pretoria on 9-10 December, 2010 to receive comments on the draft SDR. The first was with GoSA officials and Eskom; the second involved civil society organizations selected by the Bank.<sup>103</sup>

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<sup>102</sup> Management notes in the 'First Year Review of incremental scaled-up program to pilot Use of Country Systems to address environmental and social safeguard issues in Bank-supported Projects', July 14, 2009 that "*During the SDR process, there is a need to work closely with national and local authorities, rather than focusing exclusively on the borrower, as well as with other donors and stakeholders.*"

<sup>103</sup> See para. 4 and Annex 5 of the SDR, and according to the meeting agendas.

226. The record does not indicate that public consultations on the SDR were held in the project area near Medupi. The Panel's own field visits indicated and confirmed that the locally affected people and communities had strong concerns and much information of value to share on issues of relevance both to the SDR and the Project itself. Indeed, comments recorded from local people in the Medupi EIA Issues Trail reflect concerns similar to those expressed in the Request for Inspection. These include concerns, for example, about air quality, strain on water resources, adverse impacts on ecotourism, agriculture, and livestock, and cumulative impacts from industrial development in the area (EIR: Appendix Ia-c). As noted elsewhere in this report, however, these concerns were not adequately addressed in the EIA process.
227. In addition, the Panel notes that during its field visits it received statements of serious concern from local people, with supporting information, about instances of what they consider to be non-enforcement of laws to protect people and the environment from negative effects of investments and projects in the energy sector, including mining and power generation. The Panel also heard concerns relating to implementation and enforcement of measures to provide adequate local service systems (sewage, waste disposal), concerns of direct relevance to the Project due to the additional influx of workers and demands on these service systems that will be generated by Medupi (see Chapter 5). In addition, the Panel heard strong concerns about instances of a lack of follow-up on commitments to foster opportunities for local communities to benefit from project investments in the area, especially through training and job opportunities.<sup>104</sup> As noted previously, however, the SDR public consultations did not include a visit to the Project area, leaving less opportunity for these types of concerns to be heard and addressed within the SDR and, subsequently, the PAD.
228. **The Panel observes that while OP 4.00 lacks specificity about the process of consultation with locally affected people in preparing the SDR, their direct engagement would have been of high value in meeting the basic objectives of Bank policy, particularly given the scale, potential impacts, and level of controversy around and interest<sup>105</sup> in the Project in this case.**

## **G. Summary of Panel Findings on Compliance**

229. In short, the analysis presented in this Chapter indicates that Bank Management generally did good quality work in developing the SDR for the Project as required by OP 4.00. This is especially the case given the challenging and complex nature of this task.
230. The analysis does, however, highlight certain findings of non-compliance. On the equivalence side, these relate to Management's assessment of requirements relating to cumulative impacts and environmental management planning, which are of relevance to the Project and claims in the Request for Inspection. The SDR also failed adequately to address the lack of provision in South African law to use an Independent Advisory Panel for this type of project, and did not provide an adequate analysis of equivalence in

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<sup>104</sup> The Panel is not in a position to comment on specific concerns raised, and is focusing only on information relevant to whether Management has adequately considered and addressed questions of "acceptability" in light of OP/BP 4.00.

<sup>105</sup> The Issues Trail of the Medupi EIR (457 pages) comprises 207 pages of comments raised by stakeholders and the responses of the consultants to these comments.

respect to laws related to water use and mining activities which are of relevance to this Project and the claims of the Requesters.

231. In terms of acceptability, these findings point to an inadequate assessment of the capacity and implementation practices of certain key institutions responsible for reviewing EIA, monitoring and enforcing project performance, and regulatory oversight. As noted previously, the analysis placed an over-reliance on the capacity of Eskom to address concerns around project implementation and management that are systemic in nature. The Panel noted a concern in terms of the Bank's reliance on the Medupi EIA as a significant input for its SDR analysis, which was then also the subject of appraisal at the Project level. Finally, the Panel determined that consultation in the local area in preparing the SDR would have strengthened its analysis and findings, in accordance with the objectives of OP 4.00.
232. It is difficult to predict with certainty the implications of instances of non-compliance by Management identified in this Chapter. The Panel notes, however, that the potential impacts of a project of the size and scale of EISP are significant, and the existence of adequate capacity to identify and address these impacts is likely to be a crucial factor in the overall health, environment and development outcomes of the Project. These points are examined in detail in Chapters 4 and 5, in response to the specific claims of harm of the Requesters.

## Chapter 4: Compliance Analysis at Project Level: Water, Air and Climate Change Claims

233. This Chapter and the next present the Panel's findings on compliance and harm at the project level<sup>106</sup> under OP/BP 4.00, as well as other Bank operational policies and procedures applicable to the Project. The discussion considers whether Bank Management properly fulfilled applicable policy requirements, and whether any instances of non-compliance contributed to harm as alleged in the Request for Inspection.
234. The Chapter begins with an overview of key elements of the applicable policy framework. This is followed by general observations on Management's assessment of key safeguard documents, relevant to this Chapter and Chapter 5. The discussion then addresses specific issues of compliance and harm raised by the Request that relate to impacts and externalities of the Project in relation to the claims raised in the Request concerning water resources, air quality and health, and climate change.
235. The analysis considers, *inter alia*, the conclusion of Bank Management that the quality of the Medupi Environmental Impact Report (EIR) and draft Environmental Management Plan (EMP) was "fully consistent with applicable South African legal requirements" and "incorporated most of the elements of best practice as defined by the South African guidelines on integrated environmental management" (See PAD, Annex 11 Safeguard Policy Issues: Executive Summary of Safeguard Diagnostic Review for reference, para 46-48).

### A. Policy Framework

236. OP/BP 4.00 requires Bank Management to carry out not just a system-level analysis of equivalence and acceptability, but also to meet some specific requirements with regard to the projects included in the pilot program of Borrower/Country Systems. In this context, paragraph 5 of OP 4.00 states:

*"Bank Responsibility. The Bank is responsible for determining the equivalence and acceptability of borrower systems, and for appraising and supervising pilot projects that use these systems..."* (emphasis added).

237. In addition, para. 3 of BP 4.00 states explicitly that the Bank needs to examine project safeguard documents as part of its due diligence. Specifically, it provides that:

*"Environmental and Social Safeguard documents. As part of due diligence, the Bank confirms that these documents are acceptable to it and disclosed before appraisal formally begins"* (emphasis added).

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<sup>106</sup> The project-level analysis evaluates whether Bank Management properly fulfilled requirements under OP/BP 4.00 and other applicable Bank operational policies and procedures, including OP/BP 10.04, OMS 2.20, OP/BP 13.05, and others during Project design, appraisal, and implementation.

238. With regard to Project implementation, footnote 4 of BP 4.00 provides that “*OP/BP 13.05, Project Supervision, applies to pilot projects.*”
239. Table A1 of OP/BP 4.00 sets forth the policy objectives and operational principles derived from Bank safeguard policies. These objectives and principles guide Bank Management’s analysis of the equivalence of the Borrower/Country System.<sup>107</sup> They thus constitute the broad normative framework (as applied through those key elements of the relevant Borrower/Country System that are adjudged equivalent, together with any gap-filling measures) against which Management needs to assess social and environmental aspects of the project under the provisions of the policy noted above.
240. This normative framework together with other relevant operational policies and procedures (such as OMS 2.20, OP/BP 10.00, OP/BP 10.04 and OP 13.05) constitutes the operational policy framework for assessing issues of compliance and harm with regard to the Project. These individual policies were summarized briefly in Chapter 2. The sections below highlight several elements of this overall framework of particular relevance to compliance analysis at the Project level in the present case.
241. **Analysis of Potential Impacts and Externalities.** Several Bank policies require a careful analysis of a project’s potential impacts and externalities in the analytical work for a project. In the context of a Borrower/Country Systems approach, Table A1 of OP 4.00 states the Operational Principle that the potential impacts on physical, biological, socioeconomic, and physical cultural resources, including cross-border and global concerns, and potential impacts on human health and safety, must be assessed. OMS 2.20 requires that “[t]he project’s possible effects on the country’s environment and on the health and well-being of its people must be considered at an early stage” (para. 24).<sup>108</sup> Bank policy also requires due consideration of risks both to the project and to the environment.<sup>109</sup> These requirements, and related provisions for public consultation and access to information, help enable decision makers and others to have a proper understanding of the potential benefits and harms of a project, and to develop responsive measures to address negative impacts and enhance positive impacts.
242. Key provisions in South Africa law which correspond to the operational principles set forth in OP 4.00 Table A1 are noted in Chapter 3 above. The main objective of this system (expressed in s2 of NEMA as well as other legislation) and of OP 4.00 Table A1 (Environmental Assessment) is to promote sustainable development by integrating the consideration of alternatives, as well as environmental, social economic, and cultural heritage impacts into decision making. This consideration takes into account: impacts and risks; trans-boundary and global concerns; links among social, economic, environmental, and cultural heritage; and potential impacts on human health and safety. Both OP 4.00 Table A1 (Environmental Assessment) and South African law require

<sup>107</sup> See footnote 27 (referring to the definition of “country systems” under OP 4.00 as a country’s legal and institutional framework). In addition, paragraph 2 of OP 4.00 provides that “*before deciding on the use of borrower systems, the Bank also assesses the acceptability of the borrower’s implementation practices, track record, and capacity.*”

<sup>108</sup> As noted below, OP 10.04 requires “externalities” to be considered in the economic analysis of Bank-financed projects.

<sup>109</sup> OMS 2.20 requires an assessment of the sensitivity of the project viability to changes in the key parameters and, where relevant, precautionary measures to deal with risks. See also OP 4.00 Table A1 (which requires that appropriate studies are undertaken proportional to potential risks); and BP 4.00 (which requires the Bank, as part of its analysis, to describe risks and risk mitigation measures).



studies of impacts at a level of detail appropriate to their potential significance and/or risks.<sup>110</sup>

243. With respect to cumulative impacts, OP 4.00 Table A1's Operational Principle 1 for Environmental Assessment requires that *"appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts"*. As noted in Chapter 3, South Africa's EIA Regulations in force when the Medupi EIA was prepared did not require the assessment of cumulative impacts, although relevant good-practice guidance was available in South Africa (DEAT, 2004b).
244. **Project Alternatives.** Bank policy calls for the consideration of project alternatives as a fundamental means to support development objectives and address potential negative impacts that might arise from a project. OP/BP 10.04 provides that *"consideration of alternatives is one of the most important features of proper project analysis throughout the project cycle."* OMS 2.20 provides that: *"As a development institution, the Bank expects that the projects it finances will make a positive contribution to the developmental objectives of the borrowing countries and that there are no alternative means of obtaining the same benefits at a lower cost to the economy."*<sup>111</sup> Table A1 of OP 4.00 states the operational principle to *"provide for assessment of feasible investment, technical, and siting alternatives, including the 'no action' alternative."*
245. In the context of a Borrower/Country Systems approach, South African EIA regulations also emphasize the assessment of feasible alternatives.<sup>112</sup> *"Alternatives"* in South Africa's EIA system means different ways of meeting the general purpose and requirements of the activity, and includes options for development sites, layouts, designs, processes, technologies and materials (DEAT, 1998).
246. **Prevention and Mitigation of Impacts.** Bank policy also contains core provisions to adopt measures to prevent or mitigate potentially significant project impacts and externalities identified through the analytical work of a project. Table A1 of OP 4.00 includes the key operational principle to *"prevent, at least minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning..."*
247. In the context of a Borrower/Country System's approach, South African's national environmental management principles (NEMA s2) similarly require measures to avoid, or minimize and remedy, adverse impacts. The NEMA principles reflect a strict mitigation hierarchy, namely to avoid a range of impacts that could undermine sustainable development and, where these impacts cannot be *"altogether avoided,"* to

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<sup>110</sup> See also, for example the Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) and the National Water Act 36 of 1998 referred to in Chapter 3.

<sup>111</sup> OMS 2.20 (para 10) adds that a key consideration at appraisal is *"whether the project returns could be improved through changes in parameters such as the project scale, technology, timing, location, composition and the method of implementation."* In reviewing the proposed design and alternative studies, Bank staff should *"be satisfied that no worthwhile alternatives have been overlooked, and that the final solution is the optimum from a technical and economic point of view"* (OMS 2.20: para. 22).

<sup>112</sup> R1182 of EIA Regulations, 5 September 1997, in terms of the Environment Conservation Act 73 of 1989.

“*minimize and remedy*” (emphasis added) them (NEMA: s2(4)(a)).<sup>113</sup> In addition, South Africa’s environmental regulatory requirements include adherence to the expanded “polluter pays” principle (NEMA: s2(4)(p))<sup>114</sup>; the need to pay particular attention to vulnerable and previously disadvantaged communities NEMA s2(4)(c)s2); the requirement that the development, use, and exploitation of renewable resources and of the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardized (NEMA: s2(4)(a)); and the need to consider the “reserve” for water resources (National Water Act 36 of 1998).<sup>115</sup>

248. With respect to impacts on cultural property, Table A1 of OP 4.00 states several operational principles. These include: analyze feasible project alternatives to prevent or minimize or compensate for adverse impacts, and enhance positive impacts; conduct field based surveys, as appropriate, using qualified specialists to evaluate physical cultural resources; consult local people in documenting the presence and significance of physical cultural resources; and disclose draft mitigation plans in a timely manner, before appraisal, in an accessible place and in a form and language understandable to key stakeholders.
249. In the context of a Borrower System’s approach, as noted by Bank Management, South African national law includes the Environment Conservation Act 73 of 1989, the NEMA (in particular the NEMA principles in Section 2) and the National Heritage Resources Act (Act 25 of 1999), which are relevant to, *inter alia*, relocation of graves, the protection and/or sustainable use of places of objects to safeguard their natural or cultural heritage significance.
250. **Economic Analysis and Poverty Reduction.** Bank policy also calls for a careful and rigorous economic assessment and related action to ensure that the benefits of Bank-financed projects outweigh their costs and help to achieve the Bank’s overarching mission to reduce poverty. In this regard, OP 10.04 (para. 7) sets forth the parameters for a proper economic analysis, and indicates that this analysis “*examines the project’s consistency with the Bank’s poverty reduction strategy*”. In turn, BP 10.04 (para. 4(c)) provides that the project appraisal document “*considers environment- and poverty-related factors and establishes the criteria for monitoring the project’s performance during implementation.*”<sup>116</sup> OP 10.00 on Investment Lending provides overarching policy guidance on this question, indicating that Bank-financed investment projects are to “*help borrowers make the best use of their resources—natural, financial, and human—to alleviate poverty, protect the environment and enhance the effectiveness of*

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113 The mitigation hierarchy is to be applied specifically to the disturbance of ecosystems and loss of biological diversity; pollution and degradation of the environment; negative impacts on the environment and on people’s environmental rights.

114 The costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

115 As presented in Annex 3 of the SDR for Medupi, these principles are key elements in assuring that South Africa’s regulatory system corresponds to the objectives and operational principles of the Bank’s OP 4.00.

116 See also OP 1.00 on Poverty Reduction.

*their public and private sectors” and that each investment project “must...contribute to poverty reduction and sustainable economic growth.”<sup>117</sup>*

251. **Appraisal of Institutional Capacity.** Bank policies require an assessment of key aspects of technical and institutional capacity for implementing Bank-financed projects. In a Borrower Systems project, as described in Chapter 3, the question of institutional capacity is one aspect of the Bank’s analysis of “acceptability” under OP 4.00 and is also a key element in project appraisal under OMS 2.20. Among other things, OMS 2.20 provides that it is not sufficient to rely on the reputation of a borrower or its technical staff, stating that “...even though the reputation of the borrower’s technical staff and consultants may be good, Bank experience suggests that a thorough review of all technical aspects...should be a normal procedure”.
252. **Legacy Projects.** The Bank has developed Interim Guidelines for Addressing Legacy Issues<sup>118</sup> which address situations where the Bank engages in a project after it has already been initiated. These Guidelines are not an operational policy but provide a reference for the present situation given the timing of the Bank’s engagement in this Project. The Guidelines note among other things that in legacy situations “there may be concerns about the consistency of the proposed project and its environmental or social Safeguards-related documents with the Bank’s current environmental and social policies.”<sup>119</sup> The Guidelines note that these concerns may arise from, for example, inadequate environmental and social impact assessment or documentation becoming outdated due to the passage of time.

253. In this regard the Guidelines further state that

*“...the risk of non-compliance with Bank safeguards policies that can be associated with ...legacy projects may be unacceptably high in some cases, and Management may be unwilling to have the Bank involved. On the other hand, there may be circumstances where there is a real need for Bank involvement, or an opportunity for Bank involvement to help significantly mitigate environmental and social impacts that may otherwise be left unaddressed.”*

254. The Guidelines specify actions that Management needs to take to address these issues and to determine whether to proceed and under what conditions.

## **B. Management’s Assessment of Project Safeguard Documents**

255. The Panel notes that Project documentation, including the Medupi EIR and related documents<sup>120</sup>, contain considerable information about issues and concerns relating to the

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<sup>117</sup> In this latter regard, the Panel’s analysis below also examines the extent to which Bank policy does, and does not, contain provisions to address the concern expressed in the Request for Inspection that the Project will “benefit mainly big industrial users, not the poor people who suffer the most from power disruptions...”

<sup>118</sup> Interim Guidelines for Addressing Legacy Issues in World Bank Projects, June 2009.

<sup>119</sup> The Guidelines refer to consistency with Safeguard Policies and do not specifically refer to a project to which OP 4.00 applies.

<sup>120</sup> These include, *inter alia*, the Terms of Reference for the EIA, the Scoping Report, the Plan of Study for the EIA, EIR, and appendices containing specialist reports and other documentation, the Addendum to the EIR, the Records of Decisions, the EMP for the Construction phase of Medupi, the draft EMP for the operational phase of Medupi, report on ash disposal options for Medupi, specialist studies, and the EIR. See Box 1 of this report.

Project. **The Panel wishes to note and recognize the work and professionalism that went into the development of this documentation.**

256. In considering Management's assessment of Project safeguard documents, it is important to note that the Bank became involved in the Project after the Medupi Power Plant was already under construction.<sup>121</sup> As previously noted, Management generally accepted the adequacy of key Project documents and took steps to assess risks relating to the Bank's engagement. In this context, as part of preparing the Project for submission to the Board for financing, Management agreed with the Borrower and Guarantor on certain important measures and actions, including support for a renewable energy component, additional analysis of greenhouse gas emissions as part of the economic analysis, and a time-bound plan to install FGD technology to control SO<sub>2</sub> emissions in Medupi.
257. The Panel has, however, identified certain important shortcomings in Management's assessment of key Project documents, which are directly related to concerns raised in the Request for Inspection. The discussion in this section provides an overview of key limitations in Project documents which Management did not adequately address. The sections which follow consider these issues in the context of the specific claims of non-compliance and harm raised in the Request for Inspection.
258. **Consideration of core principles.** There is little evidence, either in the SDR or from discussions with Project stakeholders conducted during the investigation, that the pillars of South African environmental law (NEMA principles) were given due consideration by Bank Management in reviewing the EIR and EMP for Medupi. This is significant as these core principles have a direct bearing on the potential harm and likely significance of issues within the South African context, and thus on the scope of "*appropriate studies*" and the extent of mitigation needed. Although Annex 3 of the SDR (the Equivalence Matrix per OP 4.00 Table A1) repeatedly refers to the NEMA principles as "equivalents," Bank Management does not appear to have applied these principles in evaluating the EIR's acceptability. As noted above, these principles provide the main benchmark for reviewing EIAs in South Africa; without their due consideration, conclusions about the EIR's adequacy may be flawed.
259. The EIR essentially makes no reference to the NEMA s2 principles in evaluating the potential significance of impacts or in determining appropriate mitigation. Without this frame of reference, the significance of ratings of impacts and mitigation measures are questionable. The mitigation measures proposed generally do not address the need to "remedy"<sup>122</sup> residual harm as required in this section of the Act; neither the assessment of potential harm nor the design of mitigation applies the required "risk-averse and cautious approach"<sup>123</sup>; the expanded "polluter pays" principle is not applied; and special attention is not paid to vulnerable or previously disadvantaged individuals.

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<sup>122</sup> Remedy means to repair or 'make right' through restoration or compensation; equivalent to A6 of Table A1, OP 4.00

<sup>123</sup> This approach means to minimize risks, particularly where there is potential for irreversible or irreplaceable loss of valued resources, where the activity is unprecedented, where there is uncertainty about the information, and/ low levels of confidence in impact predictions. The principle informs appropriate action in terms of A4 and A6 of Table A1, OP 4.00.

260. **Assessment of impacts and risks.** As described in later sections of this Report, the Panel identified certain important areas where the assessment of potentially significant Project impacts and risks fell short of relevant policy requirements.<sup>124</sup> In some instances, the Medupi EIR defers the assessment and mitigation of potentially significant impacts to other licensing processes. For example, study of the impacts of Medupi on quality and quantity of surface water resources is largely deferred to the EIA for the MCWAP (EIR: Issues Trail, p. 91), while the comparative evaluation of emission reduction options to ensure compliance with ambient air quality standards is deferred to the Environmental Management Plan for Medupi's construction phase.
261. In addition, although numerous issues were raised by stakeholders and captured in the Issues Trail of the EIA, some were not adequately addressed in the EIA, if at all, despite statements to the effect that they would be considered in the EIA.<sup>125</sup> For example, Management states in the SDR that "*additional impacts not anticipated by the EIR for Medupi have emerged*".<sup>126</sup> In its first supervision report, Management further states, under the heading "*Unanticipated Impacts*", that Eskom recognized quickly after construction began that there were two issues requiring additional engagement with the community: capacity constraints at the municipal wastewater treatment plant at Lephalale and substandard disposal of solid waste disposal at Lephalale.<sup>127</sup>
262. The Panel notes it is important that these issues have been identified for follow-up action. It is factually incorrect, however, for Management to state that these impacts were "*unanticipated*": the Issues Trail in the EIR notes the issue of waste disposal and the unlicensed waste facility in Lephalale, and contains a statement in response that all types of waste management would be addressed in the EIA. In terms of the NEMA (s2) principles, the EIR and Record of Decision failed to identify these clearly foreseeable impacts and to ensure that they were addressed during the EIA process.<sup>128</sup>
263. **Mitigation measures.** As elaborated in later sections of this Report, the Panel also found that certain mitigation measures proposed in the EIR are vague and general, and pay insufficient attention to "*minimizing and remedying*" negative impacts. With regard to potentially significant impacts on air quality, on water resources (quantity, quality, and associated ecosystems), and on public infrastructure and services, the proposed measures provide insufficient assurance that potentially significant impacts would indeed be "*minimized*" rather than simply reduced to some degree. Except for those measures dealing with resettlement, the mitigation measures identified do not cover compensation or "*remedy*" for potentially significant residual negative impacts.

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<sup>124</sup> See, for example, Chapter 4 C and D below on impacts relating to water and air and Chapter 5 on infrastructure services.

<sup>125</sup> For example, issues and impacts related to the provision of housing, health care facilities, schools, impacts on property values, solid and hazardous waste sites, sewage and wastewater/water treatment facilities, water storage facilities. Annex A to present Report on the EIA Process, which elaborates on examples of issues raised in the Issues Trail that were not adequately carried over into the Plan of Study for the EIA or the EIA itself.

<sup>126</sup> SDR, p.135, section 46. Acceptability Assessment: Other Issues. '*Eskom has noted that additional impacts not anticipated by the EIR for Medupi have emerged, and is working with the Lephalale municipality to address those issues.*'

<sup>127</sup> South Africa: Eskom Investment Support Project (P116410), First Supervision Back-to-Office Report. P2: 'Unanticipated impacts'.

<sup>128</sup> Also, the additional load of Medupi's construction workers on housing, infrastructure and services is similarly reflected in the Issues Trail (pp. 23, 27, 79) as needing to be addressed in the EIA.

264. The lack of specificity in the EIR means that the Project's mitigation measures are not likely to be adequate. The reference made, in the conditions specified in the Medupi Project's Record of Decision (RoD), to the inclusion of "*all recommendations and mitigation measures*" proposed in the final EIR has little traction, given that many of them are unspecific. Following on from the EIR, the Construction Phase EMP is general and vague on outcomes, targets, and indicators, focusing instead on mitigation actions. Without clearly defined targets and indicators for management, mitigation is unlikely to be effective or enforceable. As in the EIR, decisions on measures are deferred to Eskom (e.g. "*Eskom will stipulate the period and frequency of monitoring required*" (Bohlweki Environmental, 2007: Section 2.3)).
265. **Consideration of cumulative impacts.** An important claim in the Request for Inspection is that the impacts from the Medupi Power Plant are "*compounded by the potential cumulative impacts of the planned and existing generation facilities*" around the plant area, which include the Matimba Power Plant, the proposed Mmamabula power plant across the border in Botswana, the planned Sasol (Mafutha) coal-to-liquid fuels plant, and other planned coal mines and industrial plants. This concern arises especially in connection with three of the specific claims raised in the Request: those relating to air quality, water resources, and the impacts on infrastructure and services from the expected influx of workers for the plant.
266. The Panel notes that "cumulative impacts" comprise the sum of impacts from past, present, and reasonably foreseeable future projects that would compound the impacts of the project under consideration. Cumulative impacts from both the Grootegeeluk Mine expansion and the development of the Medupi plant are certain. Proposed future power generation, industrial development and/or new mining projects in the area would increase impacts on the local economy, air quality, water availability and quality, the area's sense of place, livelihoods, and public infrastructure and services.
267. Cumulative impacts in the Medupi Power Plant area may increase if a number of proposed developments in the area materialize.<sup>129</sup> The Panel notes that a "char plant" has been developed at Grootegeeluk Mine and may be expanded<sup>130</sup> and new coal mines have been authorized.<sup>131</sup> In addition, pre-feasibility studies have been carried out on the Sasol Mafutha coal-to-liquids plant near Lephalale associated with a new Exxaro coal mine<sup>132</sup>, scoping studies have been carried out for two thermal power plants in the region of Steenbokpan (Eskom), a number of new coal mines are planned<sup>133</sup> in the area,

<sup>129</sup> The 2010-2011 Lephalale IDP lists "*Another power station by Eskom, Methane gas exploration by Anglo coal, another coal mine by Exxaro with sole purpose to export coal, construction of a railway line towards Burgersfort to transport coal for export via Maputo and Richards bay harbor, and Mafutha Sasol 3*" as other developments that will impact Lephalale.

<sup>130</sup> [http://financialresults.co.za/2011/exxaro\\_ar2010/yur-growth.html](http://financialresults.co.za/2011/exxaro_ar2010/yur-growth.html): Sintel char and market coke plant at Grootegeeluk mine has been fully commissioned. Exxaro is currently evaluating phase II expansion.

<sup>131</sup> E.g. the Waterberg Coal Project (Sekoko Resources, Firestone Energy Ltd) has reportedly been granted rights to mine coal over seven properties. [www.miningweekly.com](http://www.miningweekly.com), 19 August 2011, Australian energy company Resource Generation will start coal mining at its Boikarabelo project in South Africa's Waterberg region by 2013. <http://www.mining-technology.com/news/news90661.html>

<sup>132</sup> Exxaro has a prospecting joint-venture agreement with Sasol Mining to investigate the commercial viability of developing a new coal mine ([http://financialresults.co.za/2011/exxaro\\_ar2010/yur-growth.html](http://financialresults.co.za/2011/exxaro_ar2010/yur-growth.html))

<sup>133</sup> E.g. Thabametsi is a prospective greenfields mine adjacent to Grootegeeluk mine, seen as a supplier of coal to a base-load independent power producer ([http://financialresults.co.za/2011/exxaro\\_ar2010/yur-growth.html](http://financialresults.co.za/2011/exxaro_ar2010/yur-growth.html));

and there is talk of a Waterberg Independent Power Producer developing coal-fired base-load power stations.<sup>134</sup>

268. At the time of the Medupi EIA there was not a firm commitment to, or finality on, some of these future developments.<sup>135</sup> However, the Panel takes cognizance of the fact that at least some of these planned developments were deemed likely to proceed at the time of the Medupi EIA and preparation of the SDR and PAD (i.e. were reasonably foreseeable)<sup>136</sup>, and that DEA wants to manage the area “*such that additional developments can be authorized.*”<sup>137</sup> These issues are analysed in subsequent sections of this Chapter.
269. **The EIA process.** In order to assess the potential impacts and risks of a Project adequately, and to identify effective mitigation and compensation measures, it is crucial that the scope of the EIA is well defined and appropriate steps are followed in the EIA process. The early identification of potentially significant direct, indirect cumulative and associated impacts will inform the scope of the EIA and the need for specialist studies. Moreover, it will enable the alternatives to be investigated to an appropriate level of detail using robust criteria, potential impacts to be systematically and reliably assessed and evaluated, and the mitigation hierarchy to be effectively applied. Also, it is important that the interdependencies between these key harm areas be recognized in the assessment and identification of clearly defined, measurable (auditable) mitigation and compensation measures.
270. The Panel’s expert considers, however, that the process in developing the Medupi EIR reflected certain important shortcomings on these key parameters, which were not adequately identified by Bank Management. These related to the scoping process, the sequencing of steps in the EIA process, aspects of stakeholder engagement, and the use of the Project environmental management plan to address certain types of issues.
271. The Panel notes, in this regard, that the process culminating in the Medupi EIR took place prior to the decision of the Bank to appraise the Project and approve its financing. The Panel also notes, nevertheless, that Management used the EIR as an important benchmark for its SDR findings, and has a duty to consider and assess the acceptability of the Project EIR in the context of Project appraisal.

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<sup>134</sup> Exxaro Resources Ltd : Reviewed Group Interim Financial Results And Unaudited Physical Information For The Six-Month Period Ended 30 June 2011 <http://www.4-traders.com/EXXARO-RESOURCES-LTD-1413382/news/EXXARO-RESOURCES-LTD-Reviewed-Group-Interim-Financial-Results-And-Unaudited-Physical-Information-For-13759750/>

<sup>135</sup> Sasol has delayed the progression of Project Mafutha to the feasibility phase, pending clarity on decisions regarding financial support from the government. No final decisions have been taken on the project E.g. <http://www.fin24.com/Economy/South-Africa/Big-plans-for-new-SA-oil-refinery-20110313>

<sup>136</sup> The Panel expert notes that a key challenge in this case is how to determine ‘reasonably foreseeable’ projects at the time of the EIA. When the EIA was being carried out, several proposals for power stations and mines in the Waterberg District were emerging. In that context, looking broadly at anticipated cumulative impacts would have been ‘good practice’ consistent with relevant policy. In addition, it would have been important to take into account the potential impacts on both air quality and water resources from the Sasol and Eskom proposals. This context changed quite significantly in 2009/10 with the release of the IRP2, which did not plan additional coal-fired power stations after Medupi and Kusile until the late 2020s.

<sup>137</sup> Proposed Waterberg Coal-fired power stations, EIA and EMP: DEAT Chief Air Pollution Control Officer meeting notes. Ninham Shand Consulting Services. 28 November 2008.

272. The Panel has included as Annex A to this Report the analysis of its expert on the process relating to the Medupi EIA. It hopes that this analysis will be of value to all parties concerned, and provide a better understanding of some of the root difficulties and shortcomings identified in subsequent sections in this Chapter.
273. **Associated and indirect impacts.** The Panel also examined Management's assessment, in the context of Project review and appraisal, of the linkage between the Project and certain highly significant impacts that the Requesters claim to be associated with the Project. These included, in particular, impacts arising from expanded coal mining at Grootegeeluk to supply fuel for Medupi, the additional sand excavation from Mokolo River for Medupi's construction, and the additional use of water from MCWAP Phase 1 and Phase 2 needed for Medupi's operations.
274. The Panel's analysis of why each of these should properly be considered associated or indirect impacts of the Project is set forth in Section C below (Impacts on Water Resources), given that the impacts of concern relate mostly to water.<sup>138</sup>

### **C. Impacts on Water Resources**

275. This section presents the Panel's analysis of the two claims raised in the Request related to concerns that the Project and associated additional coal mining will have serious negative impacts on water resources, and that these impacts have not been adequately identified or addressed as required by Bank policy (Claims No. 2 and 9). The section is divided into four parts: (1) brief summary of the Requesters' claims and the Management Response, (2) the Panel's analysis of the issue of associated facilities and indirect project impacts, which is particularly relevant to the two claims under consideration; (3) the Panel's observations on the allegations of harm outlined in the Request; and (4) the Panel's findings on issues of compliance and harm.

#### **1. Requesters' Claims and Management Response**

276. **Requesters' Claims.** The Requesters fear that the Medupi Power Plant and its sulfur scrubbers for pollution abatement will put additional strain on existing water sources in an area already suffering from water scarcity (Claim No. 2). In addition, the Requesters claim that the expansion of coal mining at the Grootegeeluk Mine will have negative environmental impacts, especially with respect to acid mine drainage (Claim No. 9).
277. The Panel notes additional support for the Requesters' claims from other parties, who wrote to the Panel to express concern about the impact of Medupi on water resources in the catchment area as well as the impact of associated coal mining on the water resources in the region, and requested the Panel to investigate these issues.<sup>139</sup> During the Panel's field visits, the Requesters and people living close to the Mokolo River also indicated concerns regarding the effects of sand-mining along this river by Medupi construction sub-contractors.

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<sup>138</sup> Mining at the nearby Grootegeeluk Mine also raises air quality issues and influx of laborers, as discussed in the following sections.

<sup>139</sup> Southern African Faith Communities' Environment Institute, Supplement to the Request for Inspection, dated 20 May 2010.





Picture 4: A View of the Mokolo River

278. **Management Response.** The Management Response to Claim No. 2 focuses principally on explaining how the water requirements for the operation of Medupi will be met. The Management Response states that Medupi's water needs, as well as those of an expanded Grootegeluk Mine, will be met by the Department of Water Affairs (DWA) through the implementation of the first two phases of the Mokolo-Crocodile (West) Water Augmentation Project (MCWAP). The MCWAP was "*designed to meet the 25-year planning horizon that anticipates high and growing demand for water for public supply, irrigation, and industrial use in the Steenbokpan-Lephalale corridor in which Medupi is located*" (MR: para. 39). MCWAP Phase 1 involves laying a new pipeline by 2013 along the right-of-way of an existing pipeline. (As noted in the PAD, this Phase also includes extending to Medupi this water transmission main, which is owned by Exxaro and brings water from the Mokolo Dam to the Matimba Power Plant, the Grootegeluk Mine, and the Lephalale Municipality.) Phase 2 will transfer water through a new pipeline from the Crocodile River to the Steenbokpan-Lephalale Corridor by 2015 (see Map 2).
279. The Management Response to Claim No. 2 does not specifically address nor provide information on the impacts of Medupi on water availability and quality in the area. It states however that the scoping processes for both Phase 1 and Phase 2 of the MCWAP were underway at the time the Response was prepared. It further notes that the EIA for both phases of MCWAP was expected to begin in mid-2010.
280. The Bank Management Response to Claim No. 9 states that the Grootegeluk coal mine is not an associated facility of the Project (MR: Annex 1). The Response further states that Medupi operations will not require the opening of a new coal mine but that the nearby Grootegeluk Mine "*will expand production to meet the needs of Medupi*" (MR: p. 25). The Response also notes that a "good quality" amended Environmental Management Program was authorized in terms of the requirements of South African mining law to address issues associated with the expansion of the mine's operations (SDR: p. 69; MR: para. 43).

## 2. Panel Analysis of the Issue of Associated and Indirect Project Impacts

281. In analyzing the Project's impacts on water resources, the Panel took into consideration that these impacts may result not only from the Project itself but also from the coal, water, and sand needed for the construction and/or operation of the Project. For this reason, it first addressed the issue of associated and indirect Project impacts – i.e., the linkage between the Project and the Grootegeluk Mine expansion, the MCWAP's provision of additional water supply for Medupi, and the excavation of sand from the Mokolo River to provide material needed for the construction of Medupi, all of which may have an impact on water resources. This issue is the focus of this sub-section.
282. The sub-section is divided into three parts. The first part presents the overall policy framework for consideration of associated and indirect project impacts; the second contains the Panel's analysis of the additional scale of MCWAP for water supply for the Project, the Grootegeluk Mine expansion and river bed sand-mining in the light of this policy framework; and the third summarizes the Panel's conclusions on the issue.

### a. Policy framework

283. The Requesters' claims related to water resources raise the important policy question of what types of facilities or activities give rise to "associated impacts" of the Project, or are a direct or indirect "impact" of it under relevant policy. Table A1 of OP 4.00, which provides the background normative framework for the application of country systems in the present case, states the principle that "*appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts.*" (emphasis added)
284. Relevant Bank policy does not contain a clear definition of "associated" impacts, and which activities or facilities would be incorporated in considering such impacts. OP 4.01's Annex A, however, refers to the "*ancillary aspects*" of a project, as well as activities that are "*induced*" by the project, stating that the area likely to be affected by a project includes "*all its ancillary aspects, such as power transmission corridors, pipelines, canals, tunnels ... borrow and disposal areas, and construction camps, as well as unplanned developments induced by the project (e.g., spontaneous settlement, logging, or shifting agriculture along access roads)*"<sup>140</sup>. OP 10.04 requires consideration of project externalities, including environmental impacts, but it does not specifically define the scope or reach of impacts that might arise from activities associated with a project. OMS 2.20 provides that economic appraisal requires identification, quantification and evaluation of costs and benefits "*likely to be associated with a project*" (OMS 2.20, para 13)<sup>141</sup>.

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<sup>140</sup> OP 4.01, Annex A, para. 5, January, 1999.

<sup>141</sup> Other normative frameworks not directly relevant to the present case are of potential interest as reference. The International Finance Corporation (IFC), in its updated Performance Standards (Effective Jan. 1, 2012), for example, defines "associated facilities" as those facilities that are not funded as part of the project and that would not have been constructed *or expanded* (emphasis added) if the project did not exist and without which the project would not be viable. The Inter-American Development Bank defines "associated facilities" as "*new or additional works and/or infrastructure, irrespective of the source of financing, essential for a Bank-financed project to function,*" including powerlines, pipelines, construction camps or housing, and project-effluent treatment facilities. The Inspection Panel also has addressed the question of the meaning and scope of associated

285. The Panel's investigation suggests that where new activities/facilities are developed specifically to support the Project (i.e. the Project depends on these activities/facilities), and/or where existing activities/facilities are expanded expressly to meet the needs of the Project and represent a significant increase in the scale, capacity, or size of those facilities/activities in relation to the "without project" conditions, they should be regarded as "associated" with the Project, regardless of the source of financing. That is, their potentially significant effects should be assessed or more simply regarded as potential impacts of the Project, and in either case included in the scope of the Bank's appraisal and evaluation. Furthermore, the need to treat activities/facilities as "associated" is of particular importance when they are to be located in close proximity to the Project, given the greater potential for significant cumulative impacts on the receiving area.
286. The analysis is case-specific, taking into consideration whether the impacts are reasonably foreseeable among other factors. The Panel's expert notes that early and due consideration of infrastructure or activities that are essential to support the Project or closely linked to it, and an explicit definition of the area of influence of the Project, ensure that the combined effects of different Project components are addressed.

#### **b. Panel analysis**

287. This part contains the Panel's analysis of three associated and indirect project impacts in the light of the above policy framework: the additional scale of MCWAP for water supply for the Project, the additional coal mining from the Grootegeeluk Mine expansion, and the additional river bed sand-mining.
288. **Additional scale of MCWAP for water supply for the Project.** The Panel notes that water from Phase 1 of the proposed MCWAP is crucial to the Project. Medupi's water requirements rely on the initial debottlenecking and completion of Phase 1 of the MCWAP; Eskom will sign water supply agreements to take almost half (49.5%) of the Phase 1 water allocation.<sup>142</sup> The Panel thus considers that the transfer of water from Mokolo Dam under MCWAP Phase 1 to Medupi is an impact of the Project, and essential to the functioning of the power plant.
289. There are also important linkages between Medupi and Phase 2 of MCWAP. These include: a) a portion of the water provided by Phase 2 is needed for the reliable functioning of Medupi and especially for the reliable functioning of the Flue Gas Desulfurization (FGD) process (see Section D); b) the Medupi plant catalyzes other industrial developments in the area that themselves will require water that would not be available without Phase 2 and; c) without Medupi, Phase 1 could meet local water needs over a longer period of time, thereby delaying a need for a second phase.

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facilities and induced impacts under Bank policy in some of its previous cases. For example, in the Inspection Panel Investigation Report on the West Africa Gas Pipeline, May 2008. In considering the Project area of influence in relation to a proposed gas pipeline, the Panel noted *"the importance, under Bank policy, of examining impacts linked to the WAGP that may occur both upstream and downstream of the new pipeline, including those that relate to the development of new areas of production and transport."*

<sup>142</sup> EISP First Supervision Back-to-Office Report, 26 October through 4 November, 2010.

290. **Additional coal mining from the Grootegeluk Mine.** The Panel notes that the expansion of the operations of the Grootegeluk Mine to supply coal to Medupi is crucial to the Project.
291. The EIA for Medupi recognizes that additional coal mining from the Grootegeluk mine to supply Medupi is an impact of the Project.<sup>143</sup> The EIA does not, however, attempt to investigate these effects in detail. It explains that *“this omission is premised on the assumption that an expansion in the operations of the mine would require a separate EIA, including a specialist social impact assessment”* (Medupi EIA: p. 413)
292. The Grootegeluk Mine, which supplies coal to Matimba and will supply Medupi, is currently the only coal mine in the Waterberg area of Limpopo Province. It employs 2,000 people and produces 18.8 million tonnes a year (Mtpa) of final coal products. The PAD states that production at the Grootegeluk Mine will be expanded by an additional 14.6 M Mtpa of thermal coal when in full operation (PAD: p. 72) to supply Medupi. The PAD further states that no new coal mines will be developed to supply fuel to Medupi, and because no mining or construction will occur outside the already permitted boundaries of the mine, relevant regulations do not require a full EIA and environmental authorization from DoEA (PAD, p. 72). Rather, according to the PAD, the company is obliged to obtain approval of an amendment to its Environmental Management Program (PAD, para. 273).
293. The Panel notes that the Project is described as a “mine-mouth” coal fired power plant, and includes the construction of a conveyor system from the Grootegeluk Mine that will have a continuous throughput capacity of 2,000 tons per hour (PAD: Annex 4, para. 11). The Loan Agreement states that ‘*Medupi Power Plant*’ means, collectively, *“the super-critical coal-fired base-load power plant in the Lephalale local municipality within the territory of the Guarantor with a gross installed capacity of 4,800 MW and the associated transmission lines and electrical substations, as well as emissions control systems, coal conveyor, ash conveyor and disposal infrastructure, water treatment plant and water pipeline, and access roads to and on the plant site”*<sup>144</sup>. The SDR describes the expanded coal mining at Grootegeluk in the context of “associated facilities” to the Project (SDR, pp 68-71).
294. In light of the above, and as recognized by the Project EIA, the Panel considers that the expansion of coal mining to supply the Medupi Power Plant is an impact of the Project.
295. **Additional River Bed Sand-mining.** With respect to the excavation of sand from the Mokolo River, the Panel has received reports that this sand is being used directly for the construction of the Medupi Power Plant. That this sand could have been supplied from other but more distant sources does not change the reality that sand excavation from the nearby river for Medupi may have significant impacts on the river system that represent a part of larger, cumulative impacts from the plant for the local communities and environment. Local residents living close to the Mokolo River are very worried about the potential impacts on the river of this large scale sand excavation for Medupi. These

<sup>143</sup> Medupi EIR, p. 412-3

<sup>144</sup> Loan Agreement Appendix: para. 25, see also Schedule I, Part A) and that the equivalent of USD 1,766,370,000 have been allocated to the financing of this part of the Project (Loan Agreement: Schedule 2, Section IV).

activities and impacts were, in the present case, a reasonably foreseeable impact of the Project that would not be occurring but for the construction of Medupi.

### c. Conclusions on Associated and Indirect Project Impacts

296. For reasons described above, the additional scale of MCWAP, the expansion of the operations of the Grootegeeluk Mine, and the additional river bed sand-mining along the Mokolo River by sub-contractors for Medupi construction<sup>145</sup> should be regarded as impacts of the Medupi Power Plant.
297. The Panel is mindful that the scope of “associated impacts” is potentially large, and needs appropriate limitations. It would clearly be impractical and inappropriate to define each and every facility and activity linked to the project as an “associated impact”; inputs likely to have insignificant impacts would best be addressed through procurement and supply chains. However, where the associated facilities and/or activities could result in significant individual or cumulative effects, it is important to bring them into the scope of the Project and related appraisal and supervision; the objective being to ensure that the impacts, risks and externalities would comply with the Bank’s policies. The analysis may also make appropriate use of any existing, related analytical work<sup>146</sup>.
298. In the present case, coal, water, and sand for construction and/or operation are essential for the Medupi Power Plant, and are associated with potentially significant impacts on water resources<sup>147</sup>. In this light, and taking into consideration geographic proximity and other factors mentioned above, **the Panel is of the view that the additional scale of MCWAP Phase 1 and Phase 2, the expansion of the operations of the Grootegeeluk Mine, and the impacts of additional river-bed sand excavation from the Mokolo River for Medupi, as described above, are associated with the Project.** This is important for the proper application of relevant Bank policy in the present case, and the requirement, noted above, to ensure that *“appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts.”*
299. The Panel notes and appreciates the fact that Management keeps abreast of progress on the MCWAP project and its EIAs, and of sand mining issues. The Panel also notes, however, that Management is not formally involved in the appraisal or supervision of these facilities and activities. In practice, the impacts of these activities are being assessed in isolation from one another, preventing an evaluation of their combined effect on important attributes. Excluding their consideration from the ambit of the Medupi Power Plant means that impacts of these separate activities are assessed in a fragmented way against the same (as opposed to a changing) baseline, preventing the evaluation of

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<sup>145</sup> Other facilities/activities with the potential to impact on water resources might be similarly regarded as associated with the Project, such as the ashing facility and ash dump (farm Eenzaamheid), the Medupi landfill site (farm Grootvallei), and sewage and water treatment facilities.

<sup>146</sup> In an earlier investigation report, the Panel similarly noted that Project-required assessments may and should make use of relevant existing assessments and documentation. Inspection Panel Investigation Report, Uganda Hydropower Project (Bujagali), p. 40, paras.134-135.

<sup>147</sup> They are also associated with potentially significant other impacts, such as on air quality, public services infrastructure, health and natural habitat.

cumulative impacts and the identification, potentially, of synergies and more effective and efficient means to address these issues.<sup>148</sup>

### 3. Panel Observations on Harms Alleged in the Request

300. This section presents the Panel's observations on the harms related to the impacts of the project on water resources alleged in Claims Nos. 2 and 9 of the Request.
301. The water related concerns of the Requesters and affected people, as further elaborated during the visit of the Panel team, relate both to the impacts of Medupi itself and to the impacts of the additional scale of MCWAP Phase 1 and Phase 2 for the supply of water to Medupi, the expansion of the operations of the Grooteegeluk Mine to supply coal to Medupi, and the additional river-bed sand excavation from the Mokolo River for the construction of Medupi, as described above. These concerns can thus be grouped in four categories: (1) water supply to Medupi and impacts on surface water availability; (2) Medupi's water use and waste water disposal, and impacts on water quality; (3) expanded mine operations to supply coal to Medupi, and impacts on water quality and availability; and (4) river bed sand-mining along the Mokolo River for construction of Medupi, and impacts on groundwater availability. Each is discussed below.
302. **Water supply to Medupi and impacts on surface water availability.** The requesters fear that the planned additional transfer of water from the Mokolo Dam for the Medupi Power Plant under Phase 1 of MCWAP may adversely affect the availability of water for current users along the Mokolo River, especially farmers using water for irrigation; and could also adversely affect the future availability of water for domestic use for the growing population of Lephalale town as well as the minimum ecological flow in the river during drought periods. Local residents expressed fear that water allocation to the Medupi Power Plant will be given priority since Eskom is a "strategic user" and receives preferential treatment, and will hence compromise the supplies to non-strategic water users. There is also concern that these pressures could be exacerbated by delays in commissioning the planned pipeline from the Crocodile River in Phase 2 of the MCWAP.
303. The Mokolo Dam under MCWAP Phase 1 will supply 14.5 Mm<sup>3</sup>/yr to Eskom for use by both the Matimba and Medupi plants. This compares to a combined water requirement of 17.6 Mm<sup>3</sup>/yr for both plants, assuming full implementation of FGD at Medupi<sup>149</sup>.
304. The Panel notes that flow in the Mokolo River, like that of the Crocodile and other tributaries to the Limpopo, varies substantially from year to year and between seasons<sup>150</sup>. Data show that in twelve of the last thirty years there was no inflow from the

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<sup>148</sup> This intention is expressed, e.g., in the EIR for Eskom's proposed additional two power plants in the Waterberg (Ninham Shand, 2008, p.18), which states that, although the EIAs for the power stations and the "requisite coal mine" are distinct, "*cumulative impacts will be taken into consideration where applicable.*"

<sup>149</sup> EISP (P116410) 2<sup>nd</sup> Supervision Back-to-Office Report (n.d.). Para 36 Aide Memoire, South Africa: Eskom Investment Support Project (P116410) and Eskom Renewable Support Project (P122329), Project Supervision and Technical Discussions Mission, September 1, 2011.

<sup>150</sup> See DWAF, 2010 b.

Mokolo River into the Mokolo reservoir<sup>151</sup>. The area is also subject to seasonal droughts. Climate change is expected to increase the variability of rainfall and river flow<sup>152</sup>.



Picture 5: A View of the Mokolo Reservoir (May 2010)

305. **The Panel observes that the key impact of Medupi on water supply and availability downstream of the Mokolo dam is that the plant's operation will involve the "consumptive use" of water that will then not be available to other users downstream.** In the initial years, prior to the installation of FGD, the amount lost to downstream users will be up to 6 Mm<sup>3</sup>/year; after the installation of FGD, the amount lost will increase to up to 12 Mm<sup>3</sup>/year<sup>153</sup>. These are significant amounts, especially in dry years, and may increase the frequency and duration of the periods in which there are no or only small releases from the Mokolo dam, and thus significant water shortages for downstream users along the lower Mokolo River.
306. Concerns about the consumptive use of water by the plant are exacerbated by the variability of flow in the Mokolo, as noted above, and the possibility that future water demand will exceed supply. The EIR for Medupi notes that water availability and water use in the Mokolo catchment are currently—i.e. without the Medupi Power Plant—in balance, but that when allowance is made for the legally required reserve in this system, *"...there would be insufficient water to maintain the required balance"* (EIR: Section 5.5.3). Concerns about the future supply-demand balance (and hence about possible shortfalls in water for downstream users) derives from several sources: the unpredictability and variability in water flows into the Mokolo Reservoir; the lack of information about the actual storage capacity of the reservoir which, after 30 years of operation, is likely to have been reduced; the existing rights and levels of current water

<sup>151</sup> See: <http://www.dwaf.gov.za/hydrology/weekly/ProvinceWeek.aspx?region=LP>

<sup>152</sup> See Turrall, Burke, and Faures, 2011. According to De Villiers and de Wit, 2010, climate change and water quality deterioration are not included in current models used to forecast South Africa's official water outlook scenarios. The authors of that report show that if climate change and water quality are considered in the analysis, the country's water shortages by 2025 appear much larger than they do according to the National Water Resources Strategy.

<sup>153</sup> The net amount of water consumed depends on return flows, on which Project documents do not contain information.

use for irrigation downstream of the Mokolo Dam, on which data validation is still underway; and the uncertainty about whether the construction of the MCWAP Phase 2 pipeline will proceed as originally envisaged.<sup>154</sup>

307. The Panel's expert is of the view that insufficient attention appears to have been given in the Project's analyses of water supply to the unpredictability and variations in flow in the Mokolo River<sup>155</sup> and to the existing rights and level of water use. In addition, the potential effects of climate change on Mokolo River flows, noted earlier, are not adequately analyzed in the MCWAP Phase I EIR nor mentioned in the consultant's Terms of Reference for that assignment.<sup>156</sup>
308. The EIA of MCWAP mentions the need to provide water for the legally required "reserve"<sup>157</sup> in the Mokolo River. However, the Panel notes that if the MCWAP Phase 2 is delayed or curtailed, there is no provision for this reserve, since Medupi's "alternative" water resources (which, as discussed in Section D below, include return flow from Lephalale and pumped groundwater) will all be needed to supply water for the operation of Medupi and the water supply to the Lephalale municipality. In this respect, according to the MCWAP EIA, "*It may be possible that as an interim measure the dam be over-abstracted for a short period before Phase 2 is implemented. This dam will then be assisted to recover by supplying a larger portion of the demand from the Crocodile River*" (Nemai Consulting, 2010b: p. 42)<sup>158</sup>. Taking into account that, according to recent information<sup>159</sup>, the MCWAP 2 will not be completed until at least 2018, the reliability of water supply would not improve for a significant period.
309. The probability of harm from water shortages to other users and the magnitude of its effect increase incrementally as power generation units are commissioned, and remain until the water supply is augmented from Phase 2 of the MCWAP. The MCWAP Phase 1 EIR proposes the purchase of irrigation rights as compensation for affected users. In this regard, the Panel's expert notes that such compensation is only acceptable when alternative livelihoods or employment opportunities are made available. In this case, such alternatives are not readily available; reducing irrigation flows will be especially harmful to subsistence farmers who rely on irrigation water for domestic use and consumption.
310. **The Panel observes that plans for Medupi make inadequate provision to minimize and remedy adverse impacts on water resources availability in the Mokolo river basin. On the contrary, project documents and specifically the EIR for the MCWAP Phase 1 acknowledge that water users will be temporarily disadvantaged**

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<sup>154</sup> Aide Memoire, South Africa: Eskom Investment Support Project (P116410) and Eskom Renewable Support Project (P122329), Project Supervision and Technical Discussions Mission, September 1, 2011, para.36.

<sup>155</sup> It is noted that a few years ago during a prolonged drought, the water supply to the Matimba Power Plant was insufficient, nearly forcing its shutdown.

<sup>156</sup> This appears to be because, as noted in the MCWAP Phase I EIR, "... *global warming studies do not form part of this project study. Due to the national energy crises the project could not follow the normal DWA process, and needed to be accelerated*" (Nemai Consulting, 2010b, Appendix N: p. 26).

<sup>157</sup> The Intermediate Reserve Determination Study for the Mokolo Catchment (DWA 2007) was signed off by the Minister, and is required to be met in terms of the National Water Act 1998.

<sup>158</sup> Considering the variable flow pattern and limited storage capacity of the reservoir, it is not clear that over-abstractation is feasible. Compensation by greater flow from the Crocodile River is only possible after completion of the MCWAP 2. As noted in the text, at present the completion date of the MCWAP 2 is uncertain.

<sup>159</sup> EISP (P116410) 2<sup>nd</sup> Supervision Back-to-Office Report (n.d.)



and their water supply curtailed<sup>160</sup>. Moreover, under the Guarantee Agreement, GoSA has committed to supply all the water needed for the operation of Medupi.<sup>161</sup>

311. The Requesters furthermore are concerned about the impact of the transfer of water from the Crocodile River to the Lephalale area under Phase 2 of MCWAP. According to the Management Response, Phase 2 of the MCWAP involves the transfer of 169.3 Mm<sup>3</sup>/yr<sup>162</sup> through a new pipeline that, bypassing the Mokolo Dam and River, will bring water directly from the Crocodile River to the Steenbokpan-Lephalale corridor (i.e. straight to Steenbokpan) by 2015 (MR: p. 23). The planned transfer of water from the Crocodile River to the Lephalale area is premised on the augmentation of the water flow in the Crocodile River catchment with urban wastewater to be piped from the Gauteng area (which essentially entails a transfer of water from the Vaal River basin to the Crocodile basin) (DWAF, 2010a). The Panel notes that there is concern that serious environmental and health consequences could arise from transporting poor quality water from Gauteng<sup>163</sup> through the Vaal and Crocodile rivers to the Waterberg region. For the Lephalale area, questions were raised about how this additional water will be treated and used.
312. Contrary to expectations, Phase 2 of the MCWAP is not taking place in parallel with Phase 1. Indeed, according to a December 2010 report, “*with current uncertainties it is not possible to define when the implementation of the MCWAP-2 will proceed.*”<sup>164</sup> It now appears likely that a MCWAP second phase, should it go ahead, will comprise a pipeline of reduced diameter. A recent Back-to-Office-Report states that Phase 2 of the MCWAP has been substantially delayed and is likely to proceed in the form of a pipeline that is estimated to transfer only 107 Mm<sup>3</sup>/yr (million cubic meters per year)<sup>165</sup>, rather than the 169.3 Mm<sup>3</sup>/yr indicated in the Management Response (MR: p. 23). This is because the prospects for some of the major industrial developments considered in preparing the MCWAP Phase 2 are now uncertain or significantly delayed, though the PAD suggested otherwise at the time of Project approval<sup>166</sup>.
313. Although Medupi would not be solely responsible for impacts on water resources in the Mokolo and Limpopo rivers arising from the MCWAP Phase 2 (which is ultimately supposed to provide water for a wide range of users), Medupi is currently the main assured user of such water from the augmentation scheme.
314. During the Panel’s field visits, a further concern was raised: the effects that the water transfer schemes related to the Project may have on the Limpopo River, including for people in Botswana on the left bank of the river. The Panel notes that changes to water

<sup>160</sup> MCWAP1 EIR: p. 53

<sup>161</sup> This Guarantee Agreement constitutes an international agreement that calls for GoSA to “*take timely action to ensure adequate supply of water to the Medupi Power Plant for the operations of the Borrower's six units, including the FGD units.*”

<sup>162</sup> *Due to the dynamic nature of MCWAP's planning process, the exact scenario and concomitant details may change depending on the requirements of the end users and their ability to raise funds for the investment.*” MCWAP1 EIR: p.4.

<sup>163</sup> The document entitled “Integrated Water Resources Planning for South Africa”, Department of Water Affairs (2010) has a section on water quality that clearly spells out the problems with the Gauteng waste water.

<sup>164</sup> See <http://www.engineeringnews.co.za/article/disjointed-progress-for-limpopo-water-project-2010-12-03>

<sup>165</sup> EISP Second Supervision Back-to-Office Report (n.d.).

<sup>166</sup> PAD para. 277 states “*MCWAP has been planned for implementation by DWA with or without the Medupi Power Plant...*”. Also, Also, PAD p. 133, para 11 states “*This augmentation scheme will therefore be developed irrespective of the Medupi Project.*”

flow in the Limpopo River, as a result of increased water utilization in the Mokolo basin (without the MCWAP Phase 2) and/or as a result of the MCWAP Phase 2 are likely to have cross-border and downstream impacts. However, neither the scale and extent of these impacts nor their consequences have been analyzed in the EIA. In addition, changes may occur in water quality in the Limpopo River or in groundwater, as a result of increased pollution from the Project and its associated facilities/activities, including expansion of coal mining operations, which could affect downstream water users and freshwater ecosystems in neighboring countries. The RESA is expected to identify the cumulative environmental and socioeconomic impacts of all the planned and existing energy sector developments on both sides of the border between Botswana and South Africa. However, impacts on water resources further downstream (e.g. Mozambique) would fall outside its scope.

315. **Expanded mine operations to supply coal to Medupi, and impacts on water quality and availability.** The Requesters state that expansion of activities in the mines from which the Medupi Power Plant will receive its coal raises environmental concerns, in particular with respect to acid mine drainage. As noted earlier, the Management Response to the Request states that the Grootegeluk coal mine is not an associated facility of the Project, that Medupi operations will not require the opening of a new coal mine since the nearby Grootegeluk Mine will expand production to meet Medupi's needs, and that a good quality amended EMP was authorized to address issues associated with this production expansion.
316. As also noted earlier, the Panel considers that the expansion of coal mining to supply Medupi is an impact of the Project. In this context, the Panel examined the extent to which the issue of acid mine drainage is addressed as a potential impact of the Project. As described elsewhere in this Report, the Medupi EIA recognizes certain impacts connected to the influx of labor linked to expanded mining operations at Grootegeluk (Medupi EIA, pp. 412-413). It further states that it does not attempt to investigate this issue in detail, on the assumption that the expansion in mine operations to supply Medupi will be considered in a separate EIA. The Medupi EIA otherwise does not address other key impacts of the expanded mine operations, including potential issues of water contamination as a result of acid mine drainage.
317. Cumulative impacts on river systems and on groundwater quality were key concerns raised by interested and affected parties (I&APs) during the EIA/EMPR process for expansion of Grootegeluk Mine (EMPR, 2006: p 21). As noted by Management, the EMPR provides additional information relating to the impacts of the expanded mine operations, including in relation to air and water resources.
318. With regard to water availability, the Panel takes cognizance of the EMPR's assessment that there is likely to be a cumulative impact on water use due both to the increased demand from the mine itself and due to the increased population of Lephalale/Marapong. Environmental impact studies rate the impacts on water resources in the Mokolo catchment as '*very high*', and the cumulative impacts of water use as '*very high*' without mitigation.<sup>167</sup>

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<sup>167</sup> Mitigation is in the form of DWAF securing an alternative water supply. Synergistics Environmental Services, 2006: p. 51.

319. The effects of mine expansion on groundwater levels and quality around the mining areas are expected to be low (Synergistics Environmental Services, 2006: Section 9.2). Mitigation of impacts on water resources comprises lining and containment of areas where contamination could occur, and 'implementation of water supply scheme' is given as mitigation of cumulative impacts on water demand.
320. The Panel notes, however, that the issue of acid mine drainage as a consequence of the expansion of Grootegeluk Mine is not mentioned in the PAD. In response to a concern raised about acid mine drainage, the SDR for the Project states that "[a]s coal mining is not part of the EISP, it is not relevant to the SDR." It further states that issues relating to the coal mine are addressed in the EMPR for the coal mine.
321. The Management Response (pgs 25-26) notes that the EMPR for the coal mine has identified acid mine drainage as an issue and proposes steps to address it. Specifically, it states:
- "Concerns about acid mine drainage were raised by I&APs [Interested & Affected Parties] during the consultation process on the Amendment to the EMPR. Measures to avoid groundwater pollution were incorporated into the design of the two new beneficiation lines, i.e. lining and containment in areas where pollutants could come into contact with soil or groundwater resources. This will include lining of the stockyard footprint, which will remove a current source of contamination by stormwater runoff. In addition to these design measures to avoid future groundwater contamination and remediate an existing source, the risk of acid mine drainage is considered low because of the semi-arid conditions and because the coal is generally rich in oxides and low in sulfides (average total sulfur content in the coal is 1.1 percent, ranging up to 1.2 percent)."*
322. The Panel's expert notes that acid mine drainage (AMD) formation is difficult to stop once it starts. If left unchecked, the formation of acid drainage will continue for decades or even centuries after mining has ceased. Since AMD often only manifests in the long term, its early detection and remediation is crucial. Monitoring is seen as a 'late stage' measure for managing AMD; accurate characterization of the mine pit and waste rock for - and prediction of - AMD, followed by measures to prevent and treat likely AMD, offer the best approach to environmental and risk management<sup>168</sup>, followed by monitoring. According to the International Network for Acid Prevention, "treating acid drainage once it has occurred, or mitigating environmental impact after it has occurred, is usually an admission that something has gone wrong either in the characterisation, planning, design or operation of a mine"<sup>169</sup>. Some lessons from other experiences with AMD are summarized in Box 3 below.

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<sup>168</sup> Acid -Base Accounting, Techniques and Evaluation (ABATE), Usher BH, Cruywagen LM, de Necker E, Hodgson FDI, South African Water Research Commission Report Number 1055/2/03, 2003.

<sup>169</sup> The International Network for Acid Prevention (INAP), 2009. Global Acid Rock Drainage Guide (GARD Guide) <http://www.gardguide.com/>.

### Box 3: Lessons from Experience - the Problem of Acid Mine Drainage (AMD)

According to the Council of Scientific and Industrial Research (CSIR) of South Africa (AMD Briefing Note 2009/02, August 2009), AMD from coal mining is problematic in the Highveld Coalfield in Mpumalanga, and has been reflected by media attention on the consequences of severe pollution seen in the Olifants River Catchment. It is likely that new coal mining in the Waterberg Coalfield (Limpopo Province) will lead to similar problems in that area in the future. There is an estimated 62ML/day post-closure decant from coal mines in the Highveld Coalfield and around 50ML/day of AMD discharging into the Olifants River Catchment, reducing the quality of water for irrigation and municipalities, as well as damaging freshwater ecosystems. Further remediation is urgently required. The threat of AMD to the environment will not be solved in the short to medium term, and is likely to persist for centuries to come. It is also not solved by a single intervention, but will require the integrated implementation of a range of measures. Such measures include active water treatment, passive water treatment systems (e.g. constructed wetlands), controlled placement of acid-generating mine waste, and prevention of water ingress into mine voids and of AMD loss from mine voids.

A 2005 paper related to this topic also is instructive: *"Experience indicates that mines that have ceased production less than 20 years ago have not yet reached a steady state where water starts to decant. The complexity of the mine's hydrology and geochemistry may result in decant running acid at first and then becoming neutral. Other mines decant when only a portion of the mine remains flooded and the effluent runs acid or alkaline and can stay that way indefinitely. Geochemical reaction kinetics are very complex and serious water pollution problems may arise long after closure."*

*Source: Post-mining rehabilitation, land use and pollution at collieries in South Africa. Limpitlaw, M. Aken, H. Lodewijks and J. Viljoen. 2005. Paper presented at the Colloquium: Sustainable Development in the Life of Coal Mining, Boksburg, 13 July, 2005.*

323. Monitoring, as relied on as mitigation in both the Medupi EIA and the Grootegeluk EIA/EMPR, is important to detect changes in groundwater quality, but it would not prevent, minimize or remediate these changes. The Panel's expert notes that many EMPRs for mines look only at a relatively short (typically 5 year) period when mining has ceased to manage negative impacts and rehabilitate mined land. AMD, however, may become evident after that time, when the mine has been issued with a closure certificate. Accordingly, there is a real risk that the need for long term monitoring and corrective action may not be addressed.
324. In the present context, the Medupi Power Plant, the Grootegeluk Mine and foreseeable future coal mining are all of relevance in respect to the issue of acid mine drainage. While the proposed lining of storage areas and discard piles would help to collect polluted runoff, this action does not consider impacts of the open cast mine itself, changes in levels of pumped groundwater and/or oxidation of previously underground rock/minerals exposed to air. Since additional coal mines are probable in the Waterberg<sup>170</sup>, the potential cumulative additive impact of pollutants and their migration are significant.
325. **Medupi's water use and waste water disposal and impacts on water quality.** The Requesters and other affected people are concerned that Medupi's FGD pollution abatement technology requires the disposal of wastewater and slurry containing chemicals, with potential risks of groundwater contamination and of seepage of polluted water into the Mokolo River.

<sup>170</sup> For example, a new announcement about a rail link to the Waterberg that could handle up to 80 million tons of coal per year for export (Creamer Media's Mining Weekly, 10-06-2011)

326. The Management Response does not specifically address the potential impact of Medupi on the pollution of ground and surface water resources in the Mokolo basin. However, as part of its response to the concerns raised in the Request about acid mine drainage (MR Annex 1, p 24), Management notes that “*groundwater quality in the project area is naturally variable and generally high in salinity, with generally low groundwater gradients due to limited rainfall recharge*”. These observations are based on groundwater monitoring and modeling at the Grooteegeluk Mine and the Matimba power plant as well as the national groundwater data base. “*The monitoring data show that the majority of boreholes in the project area have very low sustainable yields. Thus there is very little groundwater use in the project area (...) and most of the inhabitants in the project area receive delivered (piped) water supply from the municipality, Eskom, or the Grooteegeluk Colliery*”. “*Naturally high and variable salinities in groundwater (...) make it difficult to distinguish natural variability in groundwater quality from pollution plumes caused by industrial activity*” (MR; Annex 1, p 25). Similarly it will be difficult to attribute the occurrence of groundwater pollution in the Medupi area with certainty to the operation of the power plant, even if such a link appears likely. Management acknowledges detectable presence of some contaminants due to stormwater runoff in the Matimba area and notes that mitigation efforts will be made to reduce pollution and acid mine drainage from stormwater runoff through stockyards (MR: p. 26).
327. The Safeguards Diagnostic Review for EISP states that the Medupi Power Plant is designed for zero wastewater discharge, that surface water and groundwater would be monitored, and that solid waste sites and the ash dump would be lined. But neither this Review nor the PAD nor the Management Response provides substantive information on the planned treatment and/or disposal of sludge and wastewater from the FGD process.
328. The Panel notes that, according to the EIR accepted by Management, the apparent risk of groundwater pollution is moderate, at least in the near future, as the transmissibility of the underlying aquifer is low (EIR: p. 95). However, there is potential for adverse impacts if poor quality water is allowed to enter surface water resources and/or seep into the groundwater. In the view of the Panel’s Expert, the absorption capacity of both the Mokolo River downstream of Medupi and of local groundwater is small. Discharge of large quantities of untreated wastewater would have serious implications for local water resources. There is a risk of pollution unless wastewater is effectively treated before its discharge, potential sources of pollution are effectively sealed or lined, and monitoring and adaptive management are in place.
329. Potential impacts of the disposal of FGD wastes are inadequately addressed in the Medupi EIR accepted by Management; likewise, recommendations for mitigation of these impacts are minimal. The Medupi EIR refers to the increase in effluent and solid waste associated with the use of FGD in a number of places (e.g. 16.2.4 of the Medupi EIR), and the potentially significant effect on the life and extent of the ash dump (e.g. 13.2.3 of the Medupi EIR). Possible disposal options are covered in 6.6 and 6.7 of the Medupi EIR, together with a preliminary risk assessment and a number of “management options”; no firm recommendations are given and no specific alternatives are evaluated.
330. The Panel’s expert has noted that a borehole close to the ash dump has low pH and elevated sulfate concentrations linked to “*possible AMD*” (EIR: Section 6.6.3). Moreover, the Panel takes cognizance of the fact that DWA considers the rapid and

uncontrolled growth of informal settlements as a source of concern with regard to the surface and groundwater quality in the Mokolo Catchment (MCWAP1 EIR: p. 82)<sup>171</sup>. Groundwater is the main source of water supply to these rural communities and is also used widely for irrigation in the Limpopo Water Management Area and in the neighboring countries; any adverse impacts are thus likely to be significant.

331. There is a considerable risk of groundwater contamination from the coal storage and wastewater storage areas of Medupi (as also from the Grooteegeluk Mine as noted earlier). Groundwater quality is to be monitored but, apart from a wide range of possible mitigation measures that “could be” used, no firm or specific recommendations are made (EIR: Sections 13.2.3 and 16.2.1 ).
332. The Panel notes that monitoring can help to detect problems with mitigation measures that have been implemented, and thus flag the need for additional measures, but this cannot substitute for designing good mitigation “up front.” Given capacity constraints in those authorities tasked with compliance monitoring and enforcement (see Chapter 3), deferring the consideration of water quality effects is problematic.
333. **Additional sand-mining along the Mokolo River for the construction of Medupi and impacts on groundwater availability.** As noted earlier, some people living close to the Mokolo River have expressed concern that ongoing additional sand mining along this river by sub-contractors supplying the main contractor for Medupi construction (see Picture 6) has degraded the aquifer and reduced the availability of water for drinking and irrigation. The Panel has been informed that the water level in the wells of some riparian water users has dropped and they are forced to go deeper to find water. Stakeholders have also expressed concern that Eskom’s current environmental safeguards practices do not cover its suppliers, especially mining companies.
334. As detailed earlier, the Panel considers sand mining in the Mokolo River to be an impact of the EISP.
335. It is widely recognized that riverbed sand-mining may cause adverse physical, water quality and ecological impacts if not carried out responsibly. Lowering of the stream bottom through sand mining, for example, may lead to bank erosion, and sand mining may also affect linked groundwater systems. A preliminary guidance document issued by DWAF in 1999 noted the potential adverse environmental effects caused by the mining of sand from rivers, and provided guidelines for the evaluation of potential impacts<sup>172</sup>.
336. According to information provided by Requesters and local farmers, water shortages for downstream water users along the lower Mokolo River often occur during drought periods when there are no releases from the Mokolo Dam. In the past, riparian water users could depend on water supplies for their domestic use and irrigation from the shallow aquifer in the sand bed along the river. In the view of affected riparian water users, extensive additional sand mining apparently related to the construction of the Medupi Power Plant has lowered and widened the riverbed, damaged the impermeable

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<sup>171</sup> There are approximately 450 informal structures located in informal settlements in Lephalale Town (southeast of the urban core) and the Marapong area.

<sup>172</sup> “Preliminary Guidance Document for Authorisation and Licensing of Sand Mining Gravel Extraction, in terms of Impacts on Instream and Riparian Habitats”, L. Hill and C.J. Kleyhans, IWQS, March 1999.

clay layer, and led to less water being available in the sandy aquifer. Riparian water users now have access to water from the sand layer only for a short period each year, after peak flow of the river. Although sand mining has taken place historically in the Mokolo River<sup>173</sup>, the Panel was informed that it has not been at the current scale or frequency<sup>174</sup>. The Panel also heard concerns from local people that sand mining in part was being undertaken illegally, without the requisite authorizations, and that, in the granting of licenses for sand mining, conditions imposed by competent authorities appeared not to be adhered to nor enforced. During its visit, the Panel team saw vast amounts of sand stockpiled along the river, purportedly to be trucked away to the Medupi Power Plant. The Panel notes, however, that the impacts of sand-mining are limited in space (a limited number of riverine residents) and time (the construction phase).



Picture 6: A view of sand mining along the Mokolo River (May 2010)

337. In response to stakeholder concerns that Eskom's current environmental safeguards practices do not cover its suppliers, Bank Management notes that there are no provisions in South African law that would require Eskom to manage the impacts of its suppliers. And the SDR in its "Summary of Stakeholder Consultations, Pretoria, December 9-10, 2009" states that "*The Bank's environmental and social safeguard policies also do not contain in their present form this type of requirement*" (SDR: Annex 5, Issue 47, p. 136).

<sup>173</sup> A 2006 report on the state of the Mokolo River (DEAT, 2006b) had warned that sand mining "*appears to be uncontrolled and needs to be more carefully regulated to minimize the negative impacts on the river system*". This same report noted that "*It seems unlikely that the sand mining activity in this catchment [Lower Mokolo] has properly been evaluated in an EIA*".

<sup>174</sup> According to interviews, more than 60 new licenses as well as "retrospective" authorizations for illegal sand mining in one stretch of the Mokolo River have been submitted to Department of Economic Development, Environment, and Tourism (DEDET) and appear to be directly linked to the construction of Medupi.

#### 4. Panel Analysis and Findings

338. As is clear from the above analysis, the construction and/or operation of the Project creates risks of harms to both water availability and quality. These potential impacts are of particular importance given that the region is marked by water scarcity and multiple demands for its scarce water resources.
339. As indicated above, the potential harms alleged by the Requesters and affected people include the Project's impacts on surface water availability as a result of water supply to Medupi, on water quality as a result of Medupi's water use and waste water disposal, on water quality and availability as a result of expanded mine operations to supply coal to Medupi, and on groundwater availability as a result of river bed sand-mining along the Mokolo River for construction of Medupi. The Panel considers that the Requesters' allegations of harms are credible, and that the harms may affect the Requesters' rights or interests as residents in the impact area of the plant, and thus are potentially of a serious character.
340. The Panel notes that these impacts of the Project on water resources and ecosystems are cumulative in nature. As is clear from the observations in the previous sub-section, the Project and its associated activities may cumulatively reduce the availability and quality of water to other users in the area. These may be further reduced by the additive effect of an influx of people being employed at the Grootegeeluk mine and Medupi plant, and the trends of an expanding population in Lephalale.
341. The paragraphs below present the Panel's findings on whether the Bank complied with relevant operational policies and procedures, and whether, if instances of non-compliance were found, they were likely to cause the harms alleged in the Request. Because of the interactive and cumulative nature of the impacts, the Panel's findings for the four different types of harms discussed in the previous sub-section are presented jointly. The presentation is divided into three parts: general comments, specific findings, and additional findings related to Claim No. 9.

##### a. General Comments

342. The Panel notes that the focus of Management in relation to water resources appears to have been on ensuring that the Medupi power plant had a reliable source of water supply, and that insufficient attention was given in Project documents to the potential impacts that the use of water by the plant might have on other users and to the evaluation of the potential significance of Project impacts on quantity and quality of surface and groundwater resources<sup>175</sup>. The evaluation of the potential significance of impacts on water quality, on maintenance of "the reserve," on the affected freshwater

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<sup>175</sup> For example, "It would seem that the view of Eskom is that water supply is detached from the project...and DWAF must ensure water supply irrespective of the environmental impacts" (EIR: Issues Trail, p. 91). Bank Management, recognizing water availability for FGD as a "moderate" risk (PAD: Section E, p.43, para. 146 (c)(iii)), similarly appears to have considered water in terms of its supply rather than considering the wider impacts on freshwater ecosystems and users, and the implications associated with that supply, or the risks of its failure: in response to questions as to why water had not been addressed earlier in the EIA and SDR, Management replied that "the issue of water supply was addressed in the final SDR and will be thoroughly addressed in the EMF" (SDR: Annex 5, Issues 32-34).



systems<sup>176</sup> and the services they provide, and on non-strategic and downstream water users (some of whom may be particularly vulnerable<sup>177</sup>) is, in the view of the Panel, inadequate.

343. In this context, the Panel notes that the EIA for the Medupi plant, accepted by the Bank, lacks an adequate analysis of these linkages and related impacts. The Medupi EIA actually defers to the MCWAP EIA process (which had not yet commenced) for the assessment and mitigation of impacts and risks associated with water supply. As a result, Management accepted a safeguard document that did not effectively address the impacts of providing an adequate supply of water for Medupi's effective and reliable operation. This raises issues of compliance under relevant policy and appears to fall foul of a 2000 ruling that "incremental decision making" is legally incorrect in South Africa<sup>178</sup>.
344. In the Panel's view, the Medupi EIR accepted by Management and the EIR for the MCWAP Phase 1 pay insufficient attention to the cumulative effects on water flow in the Mokolo and Limpopo rivers of the Project and its associated activities (coal mining and the additive effect of an influx of people being employed at the mine and Medupi plant), coupled with the trends of an expanding population in Lephalale. The Medupi EIR also falls short of adequately addressing the project's potential cumulative effects on water quality and the associated need for greater water storage and treatment capacity, taking into account that the workforce at Medupi and the expanded Grootegeluk Coal Mine will add to requirements for water and wastewater treatment.
345. Furthermore, according to the Panel's expert, the impacts on water quality in the Mokolo and Limpopo rivers resulting from the MCWAP Phase 2 are not adequately assessed in the Scoping Report. As noted earlier, there is reason for concern about AMD, considering the likely expansion of coal mining in the Waterberg District and the transfer of return water from the Vaal and Crocodile River area.
346. Both the Waterberg Environmental Management Framework (Environomics Environmental Consultants and others, 2010) and the transboundary Regional Environmental and Social Assessment (RESA) that is being developed collaboratively by GoSA, the Government of Botswana, Eskom, and the Bank, have the potential to help in managing cumulative impacts on water resources locally and as shared with Botswana. In the judgment of the Panel's expert, however, their likely effectiveness in mitigating the range of cumulative impacts on water resources is not clear.
347. South Africa's NEMA principles require a "*risk averse and cautious approach*," environmental justice and special attention to vulnerable parties, and the minimizing and remedying of impacts on ecological integrity. The basic policy framework relevant to

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<sup>176</sup> Provision for "the reserve" in the National Water Act, 1998 safeguards the ecological function of affected freshwater systems. Ignoring the reserve will adversely affect the delivery of ecological services, contrary to the Natural Habitats Objective and Operational Principles in OP 4.00 Table A1. The services provided by freshwater systems are required to be addressed in terms of s2 of NEMA with regard to a range of impacts on ecosystems and ecological integrity, and in terms of OP 4.00 Table A1 (Natural Habitats).

<sup>177</sup> As described in Chapter 4 above, s2 of NEMA requires that environmental justice be pursued so that adverse impacts do not unfairly discriminate against any person, particularly vulnerable and disadvantaged persons, and that equitable access to resources be pursued.

<sup>178</sup> Judge H. Nel, Cape High Court. 2000. Paradyskloof case. The Wildlife & Environment Society of South Africa.

the Project also requires an adequate assessment of the Project's potential cumulative impacts. The Panel could find not find evidence that due attention has been paid to these principles in either the assessment of impacts or design of mitigation measures.

348. The Panel notes that the way that impacts on water resources have been addressed in the project may not be consistent with the operational principle in paragraph A1 of Table A1 of OP 4.00 relating to the assessment of indirect, cumulative and associated impacts. The Panel's expert notes that the potential cumulative impacts of both the expanded mine and the power station on groundwater quality/resources (together with other issues such as an increase in labor force and public services infrastructure) should have been identified early on in the EIA process, taking into account the likely increase in coal mining and coal-fired power plants in the area. Early recognition of potentially significant cumulative, indirect and associated impacts would enable collaboration between proponents, competent authorities, and other stakeholder groups. Moreover, it would allow for potential synergies and more effective and efficient joint options for mitigation and adaptive management, and the optimum allocation of associated responsibilities at least between the Grootegeluk Mine and the Medupi plant.
349. **In sum, the current situation is that Medupi is being constructed when the full spectrum of likely impacts on water resources has not been reliably identified or assessed.**

#### **b. Specific Findings**

350. **For reasons noted above, the Panel finds that there has been inadequate consideration of the Project's direct, indirect and cumulative impacts on availability and quality of surface and ground water resources. This is not consistent with OP/BP 4.00.**
351. **This shortcoming is of particular concern due to the scarcity of water resources in the region, the associated risks and in light of competing demands for those resources. The implications of these instances of non-compliance are thus important.** As detailed earlier, the construction and operation of the Medupi plant entails significant risks of adverse impacts on the availability and quality of surface and ground water resources in the area. **The Panel finds that the instances of non-compliance noted above have likely weakened the ability of the Project to take effective steps to minimize or avoid these risks, and provide measures to compensate for harms that cannot be avoided.**
352. **The Panel further finds that the Project's consideration of the impacts of Medupi on water resources was not based on a risk-averse approach, as required under the terms of OP/BP 4.00 and the NEMA s2 principles. Such an approach is not evident in the PAD or the Medupi EIR, the SDR, or the MCWAP documentation accepted/endorsed by Management.**

#### **c. Additional Comments and Findings Related to Claim No. 9**

353. The Panel notes that the expansion of the Grootegeluk Mine to supply coal to Medupi, together with a larger workforce, will result in cumulative impacts of potential significance linked to increased water use on river systems, and on surface water and groundwater quality.

354. The Panel considers that the combined impacts of the Grootegeluk Mine and the Medupi Power Plant on water resources (including on affected river systems and groundwater quality) have not been adequately addressed. Moreover, the Panel notes that the additional impacts of foreseeable new coal mines in the Lephalale area on water resources in general, and on groundwater quality in particular, have not been assessed.
355. In the context of the concerns about expanded mine operations and its potential impacts on acid mine drainage discussed in the previous section, and in light of the relevant policy framework, the Panel is of the view that it would have been appropriate for Management to find out whether or not the risks of AMD had been evaluated and measures to prevent contamination were in place, and to obtain assurance that monitoring would continue for sufficient time to ensure that any AMD would be detected and remediated. In the view of the Panel experts, the EMPR does not contain sufficient assurance that the appropriate measures are in place to address AMD.
356. In sum, the Panel's view is that Management should have taken a broader look at expansion of coal mining to supply the Medupi Power Plant, given that it entails associated and cumulative impacts of relevance and that the expansion of the Grootegeluk Mine will increase water use and risks of water pollution, particularly with regard to Acid Mine Drainage in the longer term. **The Panel finds that this is a combined cumulative impact of the Project that was not properly assessed, as required by OP 4.00.**

## **D. Impacts on Air Quality and Health**

357. This section of the Report presents the Panel's analysis on claims raised in the Request that the Project will have serious negative impacts on local and regional air quality, and that these have not been adequately identified or addressed as required by Bank policy. It begins with a review of the Request and the Management Response. It then presents relevant factual considerations, key issues and potential impacts, and the Panel's findings.

### **1. Requesters' Claims and Management Response**

#### **a. Requesters' Claims**

358. The Requesters claim that the expected "*significant*" emissions from the coal-fired Medupi Power Plant will cause health impacts, and they state that local communities are seriously concerned about these potential impacts (Claim No. 1).<sup>179</sup> In particular, they state that communities that live in the residential areas of Marapong and Onverwacht, in the vicinity of the plant, will be exposed to "*increased levels of particulates and sulfur dioxide, which already exceed local and international air quality limits.*"

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<sup>179</sup> According to the Issues Trail that is appended to the Environmental Impact Report for Medupi, people living close to the Matimba Power Plant have raised issues relating to air pollution as an ongoing concern (EIR: Issues Trail).

## b. Management's Response

359. Management states that it has reviewed the extensive environmental, social, and health analysis undertaken by Eskom as part of the EIA process and notes that this is based on robust air quality modeling, an appropriate baseline and parameters as inputs to the models, and conservative thresholds (e.g., ambient air quality criteria). The Management Response states that there will be no significant incremental impact of air emissions from the Medupi Power Plant on human health from particulate matter, mercury and other heavy metal emissions, and sulfur dioxide (para. 59), and that the human health risks of not immediately installing abatement technology are acceptable (para. 63).



Picture 7: Women fetching water in Marapong

360. Management explains that, since South African regulations require air quality impact analysis to examine cumulative impacts, the cumulative impact of adding the Medupi Power Plant's emissions to existing ambient air quality conditions was a key input into the air quality model used in the Medupi Power Plant's Environmental Impact Assessment (2005-06) and that the predictions of future conditions represent cumulative impacts (MR: para. 53).
361. The expected low level of impact, according to Management, is mainly (1) because Medupi's emissions will be reduced by the sequential installation of FGD pollution abatement technology in the smokestacks and (2) because the most populated areas in the project vicinity--Marapong and Onverwacht--are located "normally" upwind of the power plant, to the north and east respectively (MR: para. 58). According to the Management Response, areas that are normally downwind of the plant, and will have the highest SO<sub>2</sub> levels as a result of the emissions from the Plant, are mostly sparsely populated large game farms. Management states that, based on monitoring data and the modeling of current conditions, the EIR for Medupi concludes that "*little potential exists for (...) health risks due to sulfur dioxide levels*" at present, even in the high-exposure areas downwind of the plant, where population density is low (MR: para. 58).



Picture 8: View of Marapong Township and Matimba Power Plant

362. The Management Response also states that the risk to human health from the cumulative mercury emissions of the Medupi and Matimba power plants is low because emissions are predicted to be “*significantly lower than the most stringent guidelines for public exposure*” (MR: para. 60). It notes that the CALPUFF dispersion model<sup>180</sup> used in the environmental impact assessment for Medupi gives conservative predictions of future ambient air quality conditions, and thus that the EIR presents a “worst case” scenario for assessing human health effects and compliance with air quality regulations (MR: para. 50).
363. The Management Response states that though the predicted particulate emissions downwind of the Medupi Power Plant comply with national standards, those near the ash dump site at times exceed European Commission guidelines. However, the Management Response states, the design of the ash disposal system will mitigate against the generation and proliferation of ash dust.
364. Also, Management states that under the new emission standards that were adopted by GoSA in April 2010<sup>181</sup>, the Medupi Power Plant will be allowed to operate for five years as an existing plant with respect to emissions and ambient air quality, but then must install within the following three years pollution control equipment that brings it into line with the more stringent emissions limits for new power plants. The Management Response (MR: para. 65) states that the conclusions and predictions of the Medupi EIR remain valid even if examined against the 2009 Ambient Air Quality Standards. According to Management, the human health risks of not immediately installing FGD at

<sup>180</sup> CALPUFF is a USEPA multi-layer, multi-species non-steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation, and removal. CALPUFF can be applied on scales of tens to hundreds of kilometers.

<sup>181</sup> Listed activities (activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage) and associated minimum emission standards identified in terms of Section 21 of NEM: Air Quality Act 39 of 2004; 31 March 2010; effective from 1 April 2010. No 248. These so-called ‘emission standards’ are distinct from the National Ambient Air Quality Standards that were promulgated in terms of the NEM Air Quality Act 39 of 2004, 24 December 2009, No 1210.

Medupi “have been examined rigorously as part of the EIA process, and have been found to be acceptable” (MR: para. 63).

365. In a recent Aide Memoire (Aide memoire, September 2011, para. 34), Management states that per the RoD for Medupi, an air quality study was carried out which confirms that air quality in Marapong is not affected by power generation at Matimba, and therefore will not be affected by Medupi. The study does not recommend any actions for air quality control at Matimba or Medupi to control air pollution at Marapong.
366. Moreover, the Management Response states that “the DEA intends to recommend to the Minister that the region around Medupi—the Waterberg airshed—be designated as a national priority area for air pollution control” so as to deal with the “cumulative effects of any future development that may occur in the affected airshed” (MR: para. 67).<sup>182</sup> The action to be proposed “would be pro-active and designed to avoid the deterioration of ambient air quality that could otherwise occur if, as expected, there is further residential and industrial development (besides Medupi) that would increase emissions of air pollutants generally” (MR: para. 67). The Management Response also states that due to the direction of the wind, the Waterberg Biosphere Reserve will not be impacted by emissions from the Medupi Power Plant, as it is not within the Medupi Power Plant airshed.
367. The Management Response states that in addition to the above, assessment of cumulative impacts will be the subject of the Waterberg Environmental Management Framework (EMF). This framework, it is stated, will examine current conditions and long-term management options for biodiversity conservation, air quality, water supply, agricultural development, ecotourism, and industrial and population growth and will be prepared in consultation with stakeholders. It will lead to the development of a strategic environmental management plan for the Waterberg District Municipality.<sup>183</sup> Finally, the Management Response refers (para. 68) to the transboundary Regional Environmental and Social Assessment (RESA) being managed collaboratively by GoSA, the Government of Botswana, Eskom, and the Bank. The RESA will provide for air quality monitoring and management and covers the Waterberg area.

## 2. Panel Observations on Harms Alleged in the Request

368. **Key issues.** The Panel notes two issues which are relevant to the claims of non-compliance and harm in relation to the impacts on air quality:
- consistency with applicable standards on ambient air quality (which draw on a range of considerations including health effects) under the operational framework for the Project; and
  - health impacts as distinct from regulatory standards. Although ambient air quality standards take into account public health risks, actual health impacts depend on the

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<sup>182</sup> An airshed is a part of the atmosphere that behaves in a coherent and similar way with respect to the dispersion of emissions. It typically forms an analytical or management unit. It may also be used as a geographic boundary for air quality standards.

<sup>183</sup> In fact, preparation of the EMF (Environomics Environmental Consultants and others, 2010) was underway at the time of the Management Response; it was completed in December 2010.

concentration of pollutants, the numbers of people impacted, their susceptibility to adverse impacts, and the effects of exposure.

369. The potential harm to public health arises from the emissions of sulfur dioxide (SO<sub>2</sub>), nitric oxide (NO<sub>x</sub>), heavy metals (e.g. mercury) and particulates that Medupi, once operational, will add to the background levels of these pollutants already emitted by the Matimba Plant, the Grooteegeluk Coal Mine, and other activities (e.g. brickworks) in the Lephalale area--and to those likely to be emitted by planned industrial establishments in the Lephalale area and vicinity.
370. **The Project EIA Accepted by Management.** According to the EIR for Medupi (EIR: pp. 265, 281), sulfur dioxide emissions from the existing Matimba Power Plant are predicted to be responsible for exceedances of South Africa's ambient air quality standard, particularly downwind of the facility.
371. Given this baseline, it is evident that no future development resulting in sulfur dioxide emissions within the same area can be in compliance with the South African standard (EIR: p. 281). The EIR concludes (p. 286) that *"the addition of 3 new 800 MW PF units with no sulfur dioxide abatement in place would result in significant increases in the magnitude, frequency, and spatial extent of non-compliance with SA standards. A further 3 units would more than double the magnitude and spatial extent of non-compliance, whilst resulting in a 3 to 4 fold increase in the frequency of exceedance of air quality limits."* The EIR also states that *"all proposed power station configurations are indicated to be in non-compliance with SA standards"* for sulfur dioxide (EIR: p. 281; emphasis added).
372. People living downwind of the Matimba and Medupi Power Plants in the expected maximum impact zone to the southwest of the Matimba plant are likely to be exposed to emissions, although population density in that zone is low (about five persons per km<sup>2</sup>). The residents of Marapong (17,000 people, 75 people per km<sup>2</sup>) and Onverwacht/Lephalale (3,000 people, 180 people per km<sup>2</sup>) would also be exposed to the cumulative emissions from Medupi and Matimba (EIR: pp. 283-286). The Panel's expert has further noted that because the wind does not continuously blow from the northeast, people in all directions will be affected by plant emissions - even if not in the "maximum impact zone."
373. If Medupi operates without SO<sub>2</sub> abatement measures, South Africa's ambient air quality standards for SO<sub>2</sub> will be violated (Medupi EIR: Appendix Q) and hence there are likely to be adverse impacts on the health of those individuals exposed to elevated concentrations of emissions (particularly SO<sub>2</sub> and potentially also fine particulate matter). According to the Air Quality Assessment prepared as part of the EIA for Medupi, the health risk associated with the operation of six units at Medupi without SO<sub>2</sub> abatement is defined as "high"<sup>184</sup> for residents of Marapong and "moderate to high" for the residents of Onverwacht. With at least 90% control efficiency in SO<sub>2</sub> abatement, risks would be reduced to "moderate."
374. The health risk potential in the expected maximum impact zone to the southwest of the Matimba Power Plant is deemed by the EIR to be low mainly because the area is

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<sup>184</sup> Significant effects may be noticed by sensitive individuals and action to avoid or reduce these effects may be needed. Chronic respiratory ailments in adults may be aggravated (EIR: Air Quality Impact Assessment).

sparsely populated. The Panel's expert observes, however, that this characterization fails to capture the large risk present for those individuals who do live in the area. As elaborated below, the risk to each individual's health remains high, based on maximum predicted impacts.

375. **The Panel's Analysis.** Several factors give rise to uncertainties and risks regarding Management's conclusions that the Medupi investment will have no significant incremental impact on air quality and associated health effects.
376. First, while Medupi might meet the emission standards for thermal power stations specified in terms of the NEM: Air Quality Act 2004, its effects on ambient air quality and health are likely to be significant, particularly without SO<sub>2</sub> abatement. The Medupi EIR does not make firm recommendations with regard to the need for, or timing of, implementation of SO<sub>2</sub> abatement technology. The lack of clarity on this issue is carried through to the 2009 draft Environmental Management Plan for the Operational Phase for Medupi, for example in "...should the power station be required to be retrofitted with FGD at a later stage."<sup>185</sup>
377. The Panel notes that Bank Management has recognized this issue and specifically included in the Loan Agreement a time-bound plan to install SO<sub>2</sub> abatement technology in the form of FGD.<sup>186</sup> However, Eskom is not required to install FGD until between 2018 and 2021, or at a later date to be established by the Bank in consultation with the Borrower. This plan implies that up to six generation units of Medupi could operate without SO<sub>2</sub> abatement for at least three years (between 2014/15<sup>187</sup> and 2018).<sup>188</sup>
378. For this reason--and contrary to the finding of Management that health risks are low--the Panel believes that the risks to health will be high in the "maximum impact zone" and in the towns of Marapong and Lephalale, and exacerbated given the (at minimum) three-year gap between the start of operation of six units of the power station and the installation and operation of SO<sub>2</sub> abatement. Compliance with the ambient air quality standard in Marapong is not assured; SO<sub>2</sub> levels are predicted to be at the daily limit and are likely to be augmented by emissions of SO<sub>2</sub> from domestic fuel use. Without FGD, according to the EIR as noted above, health risks would be "high" to "medium high" in this area. The FGD technology chosen for Medupi requires water to operate. Should there be a delay in supply of the necessary water to the power plant, as discussed below, the operation of FGD would similarly be delayed, with protracted harm to health.
379. Second, the accuracy of predictions with regard to air quality in relation to Medupi's cumulative emissions, effects on ambient air quality and on human health is not certain. The Panel's expert believes that the CALPUFF model, used in the Medupi EIR, was not optimal for estimation of air quality impacts in the context of the area of potential impact immediately surrounding the Medupi Power Plant site. This model is primarily intended for regional air quality and transport modeling, neither of which is relevant to

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<sup>185</sup> Savannah Environmental (Pty) Ltd., 2009, "Medupi Power Station, Limpopo Province. Draft EMP for Operation and Maintenance," April. p. 1.

<sup>186</sup> Loan Agreement, Schedule 2, Section 1, paragraph C (2).

<sup>187</sup> According to the SDR, para. 54, water supply from Phase 2 of the MCWAP is not expected to become available until 2014 at the earliest "by which time all six units at Medupi are expected to be operational."

<sup>188</sup> The SDR (Paragraph 185) notes that "Operation of the six units of the Medupi plant without FGD was predicted to raise the number of times the interim daily ambient standard would be exceeded in the maximum impact area downwind to 33 times per year, and to more than double the size of that impacted area downwind."



near field impacts at the Medupi site, as well as for considering the aerodynamic effects of nearby buildings and complex terrain – none of which applies to the Medupi site<sup>189</sup>. Meteorological, baseline air and emissions data also require further validation with respect to appropriateness, and thus outputs of the model are questionable and need to be refined. As a result, all claims with respect to air quality impacts are based on what may well be serious underestimates of air quality impacts within 1 to perhaps 15 kilometers from the proposed plant.<sup>190</sup>

380. Third, while the EIA acknowledges health risks exist for project area residents, no specific health risk assessment was undertaken, and the significance of variables influencing the potential for negative impacts on the local community was not addressed<sup>191</sup>. Actual effects on health will depend on the levels of exposure and susceptibility of affected persons to airborne pollutants. In the Air Quality Impact Assessment (AQIA) for Medupi, risks of exposure were categorized as high in Marapong and Onverwacht/Lephalale. Lephalale has a relatively high level of HIV/AIDS infection compared to other parts of South Africa (Lephalale Municipality, 2009/2010); this infection level could increase vulnerability to respiratory tract ailments and thus the severity of health impacts and the strain on local--already under-capacitated--clinics and public health services.<sup>192</sup> About one in three residents of Marapong are unemployed (EIR: Section 5.7.5, p. 60) and thus considered to be vulnerable to negative health effects.
381. Fourth, the unplanned settlements in the area constitute another factor bearing on the potential health impacts of the power plant. Despite the “*sudden, rapid poorly planned expansion of the urban area of Lephalale*”<sup>193</sup> and the encroachment of informal settlement around Marapong to the foot of the Matimba Power Station, the EIR for Medupi assumes that no residential settlements would be developed within the main impact areas of the power station(s) during their operational phase. It states that “*should this not be the case the exposure potential, and hence the health risk potential, would need to be reassessed*” (EIR: Air Quality Impact Assessment, Section 9.1.4). The AQIA notes that the use of FGD will reduce plume rise and result in potential increases in

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<sup>189</sup> The Panel’s expert questions the use of a regional dispersion model (CALPUFF) when the concerns are primarily impacts closer to the points of emission. Local winds may differ from mesoscale patterns, especially as a result of terrain effects and channeling of winds. If the meteorological data used for modeling are not representative of the area of impact then the validity of modeling results is suspect. The Panel’s expert notes that other available models might have been more appropriate, e.g., AERMOD or ADMS.

<sup>190</sup> The EIR does not make clear whether the maximum impacts are the maximum impacts modeled or the maximum impacts in populated areas only. No emission estimates were found for Medupi (as opposed to Matimba) and the performance of Medupi/emissions with FGD is not certain.

<sup>191</sup> The Panel’s expert notes that this assessment can be conducted using WHO dose/response standard methods (Ostro, 2001, and others), credible air quality modeling and net air quality impact data, and demographic data from within the area of impact.

<sup>192</sup> Concern about the high rate of HIV/AIDS infection in Marapong and Lephalale was expressed by a number of stakeholders interviewed by the Inspection Panel; this infection level could increase vulnerability to respiratory tract ailments and thus the severity of health impacts. In addition, depending on the duration of exposure to elevated levels of SO<sub>2</sub> over time, the incidence of chronic respiratory ailments may rise. The link between HIV infection and respiratory diseases is well established and serious; for example, among HIV-infected children, respiratory disease is the commonest cause of morbidity and mortality (see for instance, Stephen M Graham and Diana M Gibb, ‘*HIV disease and respiratory infection in children*’, British Medical Bulletin, 2002;61: 133–150 available at <http://bmb.oxfordjournals.org/content/61/1/133.short>).

<sup>193</sup> Environomics Environmental Consultants and others, 2010, “Environmental Management Framework for the Waterberg District,” December 2010 (hereinafter referred to as EMF).

localized, ground-level concentrations of pollutants not removed by SO<sub>2</sub> abatement (EIR: AQIA Section 9.7.3); potential impacts on local communities could thus be exacerbated.

382. Fifth, there are also concerns relating to potential downwind impacts on air quality. The wind direction in the affected area of Limpopo Province and neighboring Botswana is predominantly northeasterly. In addition, there are infrequent easterly and westerly winds that could serve to combine emissions from different coal-based energy facilities.<sup>194</sup> Cross-border transport of harmful emissions from the Matimba and Medupi Power Plants is thus highly likely,<sup>195</sup> although its significance has not been assessed.
383. The Panel notes that the RESA is expected to examine and determine ways to manage the cumulative environmental and socioeconomic impacts of all the planned and existing energy sector investments on both sides of the border. The two participating governments - South Africa and Botswana - have already established a cooperative framework for the management of transborder environmental and related social impacts from development projects affecting the two countries (PAD: para. 279).
384. The Panel's expert determined that people downwind of the Grooteegeluk Mine and the two power stations, and in Lephalale town and Marapong, are particularly vulnerable to cumulative health impacts from air pollutants. Residents of the town of Lephalale and Marapong are likely to be affected by an influx of job seekers and laborers associated with both Grooteegeluk Mine and Medupi, and may suffer should the local municipality be unable to provide infrastructure and health services in accordance with the growing population.
385. The AQIA undertaken as part of the Medupi EIA assessed the combined emissions of Matimba and Medupi, but not other known cumulative impacts (e.g. of the expansion of Grooteegeluk Mine). No measures are proposed in the EIR to offset the increase in air pollution levels in the airshed due to the Medupi Power Plant, taking into account the reasonably foreseeable development of additional polluting activities in that airshed in future<sup>196</sup>.
386. The Panel notes that the EIA/EMPR (EMPR 2006: p.30-32) for the expansion of the Grooteegeluk Mine assesses the cumulative impacts of the mine, Medupi and Matimba power stations: PM10 particulate emissions are the main emissions from the mine;

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<sup>194</sup> The Panel understands that this issue is addressed in the draft "Regional Environmental and Social Assessment of coal-based energy projects along the Botswana- South Africa border: Phase 1 – preliminary analysis of cumulative impacts and preparation of terms of reference for a detailed study", SE Solutions. October 2010.

<sup>195</sup> Long-range transport of concentrated pollutants (SO<sub>2</sub>, PM10, and NO<sub>x</sub> among others) is a well-recognized phenomenon in Southern Africa especially under the highly stable conditions that are known to prevail over the plateau. It is conceivable that long-range transport could result in elevated concentrations of SO<sub>2</sub>, PM10, and NO<sub>x</sub> in intensely settled areas of Botswana and could circulate in towards urban and industrial centers of South Africa. It has been found that transport of air to Botswana occurs more than 30% of the time, and that 41% of all the air that is transported from the Highveld Priority Area of South Africa affects countries that border on South Africa, through direct or re-circulated transport.

<sup>196</sup> The SO<sub>2</sub> emissions from Medupi, modeled to be at the permissible daily limit of ambient air quality standards, would leave little capacity for other SO<sub>2</sub> emitting activities in the airshed in future. The Panel notes that the Medupi RoD conditions cover the option of installing SO<sub>2</sub> abatement measures in respect of the existing Matimba power station as well as the Medupi power station in order to ensure compliance with air quality standards. This option does not seem to have been addressed as a potential remedy to reduce SO<sub>2</sub> levels.

future base case operations could result in a non-compliance zone of up to ~10.0 km to the west and west-south-west of the mining authorisation area; SO<sub>2</sub> impacts are essentially the same as those assessed in the Medupi EIA; and Hydrogen Sulfide emissions, while having low health risk, may exceed odor thresholds downwind<sup>197</sup>.

387. Although the Waterberg EMF and the RESA, and the possible declaration of the Waterberg Priority Area for air quality management<sup>198</sup>, have some potential to manage cumulative impacts, the scope and appropriateness of the scale of these instruments to the project-specific issues, and their outcomes and application, are not yet explicit. In addition, these instruments would only have a bearing on future projects in the region. They would have no influence on mitigation measures for Medupi, though the latter will affect a number of values and change the context for future development.
388. Whilst the EMPR for the expansion of the Grootegeluk coal mine assessed the cumulative impacts of Medupi, Matimba and mine expansion, the Medupi Power Plant did not take cognizance of “reasonably foreseeable” future developments at the time the EIA was undertaken that would negatively affect air quality in the Lephalale area (e.g. additional coal-fired power stations plus coal mines, at least). Consideration of such developments would probably enable additional impacts to be taken into consideration in finalizing the project design and determining the appropriate level of mitigation measures. The Panel notes that DEA wants to manage the area so that additional developments can be authorized in future.<sup>199</sup>
389. **Risks related to delays in water supplies to Medupi.** As noted above, the Medupi project relies on the installation of wet flue gas desulfurization (FGD) pollution abatement technology to enable it to meet legislated air quality standards and to mitigate adverse health effects. Obtaining the water needed to operate wet FGD in turn relies on the timely delivery of Phase 2 of the MCWAP. The EIR for the MCWAP Phase 1 (p. 15) states that “... it is clear that the FGD technology at Medupi Power Station cannot be fully implemented without the MCWAP Phase 2 in place or without the full return flow and groundwater resources in place. The recommended engineering approach is that the FGD implementation should commence when Phase 2 is committed to and the implementation thereof already initiated.”
390. There is concern that delays in completing Phase 2 of the MCWAP may affect the current schedule for installation of FGD in the Medupi Plant, and thus have negative impacts on air quality and health. As noted earlier, water supply to Medupi has not been assured. It appears to be assumed that the needs of the power plant will be met by DWA since Eskom is a strategic water user: water augmentation schemes “are required to ensure the negative impacts are reduced” (EIR: Table 6.10); “hence the assumption that water will be made available for power-generation-associated-emissions-control technologies” (EIR: Table 6.9). But there are significant risks associated with this assumption, because the go-ahead of Phase 2 of the MCWAP relies on sufficient

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<sup>197</sup> EMPR for Grootegeluk mine expansion, Synergistics Environmental Services 2006

<sup>198</sup> In terms of the NEM: Air Quality Act, 2004.

<sup>199</sup> Proposed Waterberg Coal-fired power stations, EIA and EMP: DEAT Chief Air Pollution Control Officer meeting notes. Ninham Shand Consulting Services. 28 November 2008.

demand and cost recovery via water use charges from large industry (e.g. Sasol), energy generation (Eskom) and mines, all of whose prospects are uncertain<sup>200</sup>.

391. The high risk that water supply issues pose to the Medupi project's viability and to the use of SO<sub>2</sub> abatement technologies and the ability to mitigate health impacts effectively, is noted in the Medupi EIR, although it is stated that the proposed water augmentation scheme will make these risks "tolerable."
392. If the commissioning of the MCWAP Phase 2 is delayed beyond 2018, the Lephalale Municipality will supply return flows from the Lephalale wastewater treatment plant for capture and use by Eskom. This captured return flow is assumed to be 50% of the water delivered to Lephalale, i.e., return flows of about 2.9 Mm<sup>3</sup>/yr<sup>201</sup>. The supply to Medupi is to be further augmented by groundwater supply<sup>202</sup>. Documents used in preparing the Medupi Power Project forecast that the combination of water from the dam, together with return flow and pumped groundwater, will be sufficient to meet Eskom's full requirements for Matimba and Medupi, including full FGD at Medupi, in case the MCWAP Phase 2 commissioning is delayed beyond 2018<sup>203</sup>.
393. Of concern to the Panel is the fact that the scope and timing of Phases I and II of the MCWAP, and thus plans for water supply to Medupi, appear unreliable and subject to change even though the PAD suggested otherwise at the time of Project approval<sup>204</sup>. The lack of certainty about augmentation of water supplies has introduced contingency plans such as the proposed use of return flows from Lephalale's wastewater treatment plant plus use of groundwater<sup>205</sup>. But the Panel could find no assessment in Project documents of the reliability of these sources. These volumes of water do not appear to provide an adequate margin of error or "buffer." The Panel notes the reported increase in the presumed sustainable yield from the Mokolo Reservoir (PAD para. 275) and the uncertainties associated with a reliable supply of water from the Mokolo system until the MCWAP Phase 2 has been finished, but it has found no record that Management discussed these uncertainties and/or asked for studies to be carried out commensurate with the risks involved.<sup>206</sup>

<sup>200</sup> EISP (P116410) 2<sup>nd</sup> Supervision Back-to-Office Report (n.d.)

<sup>201</sup> The Panel's expert considers this figure unlikely to be reliable. Often a considerable part of a household's wastewater is not discharged into sewers but used on site for urban and peri-urban agriculture, or discharged into drainage ditches and septic tanks. In addition, connections to the water supply system may exceed the number of connections to the sewerage system. In periods of drought the municipal water supply is likely to be reduced and water conservation measures would reduce even further the fraction of the water supply that is returned. Distribution losses in the supply network, in the sewers, and in the water treatment all contribute to a much reduced return flow as fraction of the supply.

<sup>202</sup> EISP (P116210) 2<sup>nd</sup> Supervision Back-to-Office Report (n.d.)

<sup>203</sup> Desk Review: Waterberg EMF and MCWAP I EIR & EMP. Draft Internal Report, May 2011.

<sup>204</sup> PAD para. 277 states "MCWAP has been planned for implementation by DWA with or without the Medupi Power Plant (...)." Also, Also, PAD p. 133, para 11 states "This augmentation scheme will therefore be developed irrespective of the Medupi Project."

<sup>205</sup> This is reflected in World Bank "Eskom Investment Support Project Supervision: Waterberg EMF and MCWAP Phase 1 EIA and EMP." May 2011. However, according to the Medupi EIR (Issues Trail), "the proposed new power station would not rely on groundwater abstraction as a source of water."

<sup>206</sup> In this context the Panel wishes to quote a comment on the Medupi EIA by a provincial environmental authority: "How can the ISEP [sic] process select this site on the criteria of availability and accessibility of primary resources such as water...if the outcome of the studies [DWAF studies] is not finalized and also to be able to take decisions regarding water quantities and supply, water use and imbalances in the system?" (EIR: Issues Trail).

394. According to the Panel's expert, the incremental water requirements from a growing Lephalale population, an expanding coal mine and the Medupi Power Plant have not been considered in water allocations. Consequently the stop-gap measures to supply water to Medupi in the event of a delay in the MCWAP Phase 2 do not assure a reliable and adequate supply of water for Medupi and the operation of wet FGD<sup>207</sup>.
395. **Emission Abatement Technologies and Options.** The Panel notes that Management raised the issue of technology selection with Eskom and explored options that would reduce negative impacts. According to the PAD (p. 43), "*Absent FGD, measures to mitigate sulfur-dioxide emissions from the power plants*" represent a "substantial risk." The Panel notes that this identification of risk in the PAD was proper, in compliance with Bank policy.
396. The Panel takes note of the Bank's requirements of the Borrower by mid-2013 to "*develop, adopt, and thereafter implement a program, satisfactory to the Bank, to install FGD equipment ... taking into account technical, environmental, and financial criteria in accordance with terms of reference to be discussed with the Bank.*" The Panel also notes that such a program may include an independent feasibility analysis of alternative control technologies (SDR: p.74, para. 226). Management has informed the Panel that it will not plan any action on this front until it has reviewed the status report from Eskom regarding water supply, which it expects to receive by the end of June 2013.<sup>208</sup> According to the SDR, the Bank has "proposed" for Eskom to "*provide the Bank with a plan for FGD installation and include consideration of alternative, less water-intensive dry FGD, in the event that sufficient water is not available or allocated to support wet-FGD technology*" (SDR: p. 64, para. 190)<sup>209</sup>
397. The Panel takes cognizance of the fact that Management discussed with Eskom the potential for reducing the timeline for installing FGD by considering other technologies, including semi-dry FGD and activated carbon technology (ReACT), both of which would require considerably less water than wet FGD.<sup>210</sup> Management stated in the SDR (p. 64, footnote 158) that "*Eskom remains committed to this option should FGD installation become necessary and has made irreversible plant design decisions and material commitments based on the future use of wet FGD.*" The Loan Agreement provides for the installation of six FGD units to commence by March 31, 2018 and to be operational by December 31, 2021.
398. The Panel notes, however, that the Loan Agreement allows for the postponement of these dates at the discretion of the Bank following consultations with the Borrower (Loan Agreement, Schedule 2, paras. 10-11). The Panel observes that, according to the Management Response, Medupi was expected to come into operation beginning in 2012

<sup>207</sup> Other relevant factors include the significant variability of river flow into the reservoir and the reduced, but unknown, storage capacity of the Mokolo Reservoir.

<sup>208</sup> Management response email July 11th, 2011.

<sup>209</sup> This provision is echoed in the PAD, p. 215, which notes that if sufficient water were not available to Eskom, the Bank would recommend that Eskom "*investigate the feasibility of using a less water intensive, dry FGD technology prior to commencing full operation.*"

<sup>210</sup> The PAD (p. 217, para. 70, Annex II) refers to an eventual "*independent feasibility analysis of alternative control technologies in the event that sufficient water is not available or allocated to operate the wet-FGD units.*" Management has informed the Panel that there will be no action on this issue until the Bank has had a chance to review the status report from Eskom on the water supply issue (expected end June 2013 as per Loan Agreement), and unless it is established that insufficient water is available from the MCWAP.

(MR: Annex 1, § 20) and to be fully operational by 2017. In this context, delays in the implementation of FGD technology would compound the negative effects of air pollution from the facility.

399. The Panel notes that alternative approaches to pollution abatement are not systematically assessed in the Medupi EIR accepted by Management. A comparative evaluation of these alternatives should normally inform the design of the Project, including the optimal generating unit size. Instead, the EIR defers to the findings of Eskom studies and criteria, which are limited to technical and financial/economic criteria<sup>211</sup> and exclude environmental and social considerations.
400. The Panel notes that no systematic comparative analyses of emission abatement options and associated impacts, including infrastructure or services required to provide the required materials and manage and dispose of wastes<sup>212</sup>, were undertaken to inform the choice of wet FGD. Sections of the EIR accepted by Management repeatedly point to the need for more detailed assessment of emission abatement and FGD options<sup>213</sup>. The Panel considers that the absence of such an analysis is not in keeping with the requirements of OP/BP 4.00 that appropriate studies be undertaken proportional to potential risks.
401. As noted in the previous section, technology to reduce SO<sub>2</sub> emissions is only to be installed three to four years after all six units are operating against background levels of SO<sub>2</sub> that exceed ambient air quality standards and pose health risks. In addition, there is uncertainty about an assured supply of water to enable installation of emission reduction technology that could exacerbate air quality and associated health risks. The time lag between full operation of Medupi, the lack of emission reduction technology, and the uncertainty about timing of that technology all have a bearing on air quality and consequent health effects and point to the need for timely mitigation measures.

### 3. Panel Analysis and Findings

402. South Africa's NEMA principles require a "*risk averse and cautious approach*," environmental justice, and special attention to vulnerable parties (see above). The Panel considers, however, that Bank Management, in appraising the Project and assessing the related environmental and social safeguard documents, did not adequately address a number of Project shortcomings that reflected a failure to adhere to these principles and the overall objectives of Bank operational policies.
403. The Panel notes that the EIA/EMPR for the expansion of the Grooteegeluk coal mine assessed the cumulative impacts of Medupi, Matimba and mine expansion on air quality

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<sup>211</sup> Technologies were evaluated based on resource (limestone or dolomite) availability, proven technology, effective emissions reduction, technology risks and economic viability. EIR: pp. 18-19.

<sup>212</sup> E.g. FGD-related transport impacts are of 'high' significance. 13.3 of Medupi EIR 2006.

<sup>213</sup> The EIR mentions that options need to be "*holistically addressed and assessed in terms of economic, environmental and technical criteria, to determine the best technology to be applied*" (EIR: Issues Trail, p.71). It also points to the need for a more detailed assessment of wet waste and wastewater streams associated with wet FGD, and of options for recycling and treating water to minimize impacts on clean water supplies (EIR: Table 6.10). Moreover, a review of Medupi's compliance with the Equator Principles states that a detailed comparative analysis of abatement (FGD) options should be undertaken, "*to ensure that the installation of FGD does not create more problems than it solves*" (SE Solutions, 2008).

and health, in line with the requirements of Bank policy. The Panel acknowledges the challenges of identifying “reasonably foreseeable” future developments in a changing policy context. However, in light of cumulative impacts on air quality, due consideration should have been taken of other probable projects in the area (e.g. additional coal mines and coal-fired power stations), in determining an appropriate level of mitigation measures for the project.<sup>214</sup>

404. No specific overall health impact/risk assessment was undertaken and aside from the installation of FGD, no explicit mitigation measures to protect health are specified in the EIR. Importantly, South Africa’s NEMA Principles require particular attention to be given to avoidance of impacts on vulnerable communities.
405. Only the Environmental Management Plan for Medupi’s construction phase (Bohlweki Environmental, 2007) has been finalized; the EMP for the operational phase, as of the date of this report, is being drafted.<sup>215</sup> It is not clear whether or not an EMP has been prepared for the construction phase of the ash dump, as required in terms of the NEM Waste Act 59 of 2008 authorization for that facility<sup>216</sup>, to address management of particulate emissions. Monitoring of the air quality around Marapong, Medupi, and Matimba is required in terms of the EISP’s Record of Decision. But it is noted from the Medupi Environmental Impact Report that monitoring is not planned in the prevailing downwind areas from Medupi where maximum concentrations of emissions are likely.
406. The Panel also notes that there is a discussion of mitigation measures in Project documents, however, it has identified shortcomings in respect to impact minimization and/or compensation measures to address adverse impacts in the following areas:
- for affected parties in the “maximum impact zone” where air quality standards would be exceeded for at least three years, and in Marapong and Onverwacht/Lephalale where the risks of exposure to SO<sub>2</sub> are likely to be high<sup>217</sup> in the period of operation of Medupi without FGD.
  - risks of exposure were categorized as high in Marapong and Onverwacht/Lephalale
  - for Marapong town. The RoD conditions include a requirement for Eskom to initiate a program of support for initiatives aimed at improving air quality in Marapong. The program is to be included in the construction-phase EMP and carried through to the operational-phase EMP. Eskom has completed research on

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<sup>214</sup> According to the 2008 Environment, Health and Safety Guidelines (World Bank Group; EHS) on Air Emissions and Ambient Air Quality, as a general rule, emissions from a single project should contribute at a rate no higher than 25% of the applicable ambient air quality standards, so as to allow additional, future sustainable development in the same airshed. Airshed-specific offset measures should be implemented through (a) the installation of new or more effective controls at other units within the same power plant or at other power plants in the same airshed; (b) the installation of new or more effective controls at other large sources in the same airshed; or (c) investments in systems to substitute for the use of coal.

<sup>215</sup> Management has informed the Panel that the project is experiencing delays which push back commencement of operations of the first unit to perhaps March 2013; Management believes therefore it is too early for Eskom to begin work on submitting a detailed Operational EMP to the DEA for review and approval. (November 9, 2011)

<sup>216</sup> An authorization was granted on 28 October 2009, requiring a Construction Phase EMP (2.1.3); this requirement post-dates the Construction EMP prepared for the Medupi power station (2007).

<sup>217</sup> Medupi EIR section 9.6.2, 2006.

this matter and has presented the findings to the local authority for implementation (EIR: p. 239)<sup>218</sup>

- to offset the increase in air pollution levels in the airshed due to the Medupi Power Plant, taking into account the reasonably foreseeable development of additional polluting activities in that airshed in future. In particular, no consideration seems to have been given to promoting a switch to less polluting fuels in Lephalale and Marapong by ensuring the supply of electricity to those areas through stepping up local reticulation.<sup>219</sup>
- to control future settlement patterns and avert risk of exacerbated health impacts in areas of high exposure; the high rate of informal settlement in the area (e.g. the base of Matimba Power Plant) is a concern.

407. The Panel concludes that the Requesters' allegation of potential harm on these issues is credible, that such harm may affect the Requesters' rights or interests as residents in the impact area of the plant, and that the harm is potentially of a serious character. **The Panel finds significant shortcomings in Management's due diligence assessment of air quality issues and of the development of responsive and timely mitigation measures to address risks of serious harm. This is not in compliance with the provisions of OP/BP 4.00.**
408. The Panel further finds that an analysis of the cumulative effects of the Grootegeluk mine, Medupi and Matimba on air quality in the local airshed was carried out as part of the EIA/EMPR for expansion of the Grootegeluk Mine. The Panel finds that this is largely consistent with OP/BP 4.00. However, the Panel is of the view that due consideration should have been given to probable future projects in the area (e.g. additional coal mines and coal-fired power stations), in determining the appropriate level of mitigation measures for the project.
409. **The Panel finds that it is likely that these shortcomings in meeting relevant policy requirements have reduced the ability of the Project to assess and respond to the significant potential negative air quality impacts of Medupi in an integrated and effective manner.** As described above, the Panel has found an absence of adequate mitigation measures for a number of key ambient air quality impacts associated with the Project. The Panel is of the view that the lack of an integrated analysis will hamper efforts to meet required air quality standards and avoid significant risks to health within the airshed, particularly in the context of the anticipated cumulative impacts of Medupi and anticipated future investments and developments.

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<sup>218</sup> According to Management, "*the opportunities are in the realm of the local authority to address.*" Management Response email, July 11th, 2011, notwithstanding the RoD requirement of Eskom to include support for this program in both the construction and operational phase EMPs.

<sup>219</sup> About 70% of households in Lephalale Municipality and 75% in Marapong have electricity for household lighting, according to the Lephalale Spatial Development Framework (second draft, November 2006: section 2.1.1.2). It is noted that "*virtually all households*" in the town of Lephalale itself have access to electricity. However, it is also noted that Eskom, not the local authority, is licensed to provide and sell electricity to Marapong communities and that there are "*severe delays in the installation of the appropriate infrastructure*" (section 2.4.6).



410. The Panel notes that Management is supporting a study of cumulative impacts in the context of a broader Regional Environmental and Social Assessment that is ongoing.<sup>220</sup> **The Panel notes the importance of these initiatives and their potential to help manage cumulative impacts at a regional scale.** The initiatives are not expected to have an influence on mitigation measures for Medupi, though they could change the context for future development in the area and help to regulate future emissions.

## E. Impacts on Climate

411. The Request for Inspection also raises concern about the potential impacts of the Project on the global problem of climate change, due to large-scale greenhouse gas emissions from the Medupi coal-fired power plant financed under the Project. The Requesters consider that these impacts of the Project have not been adequately considered and addressed as required by Bank policy (Claim No. 10).
412. The discussion below presents the Panel's analysis and findings in respect to the claims in the Request relating to the issue of climate change.

### 1. Requesters' Claim and Management Response

413. **Requesters' Claim.** The Request for Inspection details three main claims relating to climate change impacts from the Project (Claim No. 10):
- The proposed loan will compromise the World Bank's commitments on climate change, and make it more difficult for South Africa to meet its greenhouse gas (GHG) reduction commitments.
  - Despite claims that the Medupi plant will use "*cleaner coal technology*" and will be "*carbon capture and storage-ready*," there is no certainty whether these measures will be sufficient to control the "*enormous amounts*" of pollutants emitted. Separately, the Request claims that the Project failed to consider adequately alternatives to coal, a claim which relates, *inter alia*, to concerns about GHG emissions.
  - World Bank support for the Project would be in contravention of the Bank's criteria for support to coal plants. This claim is supported by the Expert Panel report (Expert Panel, 2010), which raises doubts about the World Bank supporting Medupi without adequately complementing it with renewable energy development.<sup>221</sup>

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<sup>220</sup> As noted in the PAD, "*because several coal-fired power stations are operating or being built on both sides of the Botswana-South Africa border, and both countries envision future expansion of industry and power generation in this area, there is a need to address the possible cumulative, long-range, and transboundary effects of these investments. Consequently, in the course of preparation of the Morupule B Generation and Transmission Project in Botswana, the Bank initiated discussions with the authorities in both countries to jointly undertake a Regional Environmental and Social Assessment (RESA)*" (PAD: para. 279). The Waterberg EMF and the possible declaration of an expanded Waterberg Priority Area for air quality management (in terms of Government Notice 30 September 2011 in terms of the NEM Air Quality Act 2004) are other important ongoing initiatives.

<sup>221</sup> Request for Inspection, p. 5, para. 28.

414. **Management Response.** Management notes that the GoSA's commitment to climate change mitigation is signaled by a number of national and international commitments to pursue a low carbon growth path. South Africa, in Management's view, has expressed a commitment to balance the urgent need for new generation capacity with the development of low-carbon energy technologies, demand-side management programs, and efficiency improvements.<sup>222</sup>
415. Management notes that the Medupi plant will be fitted with advanced combustion technology to reduce carbon, nitrous oxide, and sulfur emissions during operation. The Project, according to Bank Management, allows South Africa to meet its urgent need for energy to support national development efforts while strengthening climate change mitigation interventions by financing concentrating solar power (CSP) and wind energy plants.
416. In 2008, South Africa's Cabinet endorsed the Long-Term Mitigation Scenarios study to reduce carbon emissions, and the proposed World Bank loan supports those plans. The intention is to ensure that carbon emissions peak during 2020-25, plateau for a decade, and begin declining thereafter.
417. Management notes in the PAD that Medupi uses the best available and reliable technology<sup>223</sup> which reduces emission levels of conventional pollutants to comply with international good practice and minimizes CO<sub>2</sub> emissions to levels below what would result from the use of conventional pulverized coal combustion (i.e. sub-critical) technology. Medupi will be equipped with highly efficient fabric filters to reduce particulate emissions, low NO<sub>x</sub> burners to control nitrogen dioxide and, eventually, wet FGD technology to reduce SO<sub>2</sub> emissions.
418. Management believes that presently there are no domestically available alternatives for energy generation other than coal, and that coal will "dominate" South Africa's energy mix for the next 10-15 years. The only large-scale renewable alternative to coal in South Africa, according to the Management Response, would be CSP but the technology for this option is not yet developed enough to make it a viable provider of base-load power.
419. Thus, according to Management, the EISP allows South Africa to meet its urgent energy security needs through the 4,800 MW Medupi Power Plant and at the same time "supports interventions to mitigate climate change" (MR: p. 21) through the implementation of the Government's low-carbon strategy by financing the 100 MW Upington CSP plant which will be the largest of its type in the world and the 100 MW Sere Wind Power Project which, according to Management, will also have considerable demonstration impact.
420. Moreover, Management states that the Project meets all six criteria of *Development and Climate Change: A Strategic Framework for the World Bank Group* (World Bank, 2008), an approach which has been reinforced by the Board. This, according to Management, has been confirmed by an independent Expert Panel (Expert Panel, 2010) which reviewed the Project against the six criteria (MR: Annex 1§22, p. 37).

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<sup>222</sup> See Management Response, pages iv, 6, and 37 on the balance between generating capacity needs and low-carbon growth.

<sup>223</sup> Management notes in the PAD (p. 35, para. 117) that the decision to use super-critical technology was made in 2006 by Eskom.

## 2. Panel Observations, Analysis and Findings

### a. Impact of the Project on International Obligations

421. The first concern of the Requesters is that the loan “*will compromise*” World Bank commitments on climate change, and make it more difficult for South Africa to meet its own policy commitments on climate change.
422. As noted earlier in this Report, the Panel only investigates issues that relate to Bank Management’s compliance with its operational policies and procedures, and related issues of harm. In this context, the Panel notes that Bank operational policy does not contain explicit climate-change targets, especially relating to greenhouse gas emissions.<sup>224</sup> Bank policy does, however, set forth various requirements to identify and address potential adverse transboundary and global impacts of a project, including those relating to climate change.<sup>225</sup> These provisions are considered in subsections (b) and (c) below.
423. In addition, and of relevance to the first claim, Table A1 of OP 4.00 states the operational principle that there should be an assessment of the “*adequacy of the applicable legal and institutional framework, including applicable international environmental agreements*” and that it should be confirmed that such framework provides that “*the cooperating government does not finance project activities that would contravene such international obligations*” (OP/BP 4.00: Table A1).
424. As noted above, GoSA has internal plans and programs, including the LTMS and Integrated Resource Plan for Electricity (Revision 2, also known as IRP2), that indicate its intentions to reduce GHG emissions. These constitute important government intentions and commitments, though not international legal obligations.
425. The Panel concurs with the statement in the Management Response that several national and international commitments have signaled the GoSA’s commitment to pursuing a low-carbon growth path, including:

*“(a) ratification of the United Nations Framework Convention on Climate Change (UNFCCC) in August 1997, and accession to the Kyoto Protocol in July 2002;*

*(b) adoption of a National Climate Change Response Strategy (2004), which outlined a broad range of principles and policy measures for mitigation and adaptation to climate change;*

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<sup>224</sup> It is also important to note, in this regard, that *Development and Climate Change: A Strategic Framework for the World Bank Group* (World Bank, 2008) is not a Bank operational policy and procedure but a strategy document.

<sup>225</sup> As described previously, OP 10.04 contains requirements to consider the global externalities of a Project, including those arising from emissions of greenhouse gases. OP 4.00 contains operational principles to consider transboundary and global impacts in the environmental assessment process for a Project, to prevent or mitigate significant project impacts that are identified, and to consider feasible alternatives to a project to reduce or avoid such impacts. Relevant provisions of South African law applicable to this project provide that “*global and international responsibilities relating to the environment must be discharged in the national interest*” (NEMA: Section 2).

*(c) association with the Copenhagen Accord of 2009, which has led to South Africa's political commitment to implementing economy-wide emission targets for 2020."*

426. In response to questions about the EISP, a GoSA publication refers to the "non-binding" commitments in the Copenhagen Accord (2009). Its specific statement reads:

*"South Africa is pursuing an energy strategy compatible with both our commitments in the Copenhagen Accord to reduce emissions by 34 percent below the 'business as usual' level by 2020 and 42 percent by 2025. This strategy includes meeting urgent generation expansion while committing to an aggressive program to enhance energy efficiency measures and introducing renewable energy as well as demand-side management."*<sup>226</sup>

427. The Panel notes that the commitments indicated in relation to the Copenhagen Accord are assumed voluntarily, and not as a matter of international legal obligation, and that the GoSA (a non-Annex I party to UN Framework Convention on Climate Change) does not have a target and timetable obligation under the Kyoto Protocol to reduce GHG emissions. The Panel notes that South Africa does not have a specific obligation to reduce GHG emissions under an international environmental agreement within the meaning of the relevant operational principle of OP 4.00. **In this context, an issue of policy compliance by Management on this point does not arise.**
428. This does not mean, of course, that Bank financing should make it difficult for the country to meet the commitments it has made, even if not legally binding. The Panel observes, in this regard, that a key element of the Project objective is to support both economic growth objectives *and* the long-term carbon mitigation strategy of the Guarantor.
429. The question of whether Bank Management has acted inconsistently with other relevant policy requirements, as alleged in the Request, is considered below.

#### **b. Measures to Reduce GHG Emissions**

430. The Requesters' further claim that there is no certainty that capture technologies will be able to control the "*enormous amounts of pollutants*" from the plant, and that the Project gave inadequate consideration to "alternatives to coal." It is the Panel's understanding that the Request questions the adequacy of the technologies selected for Medupi, as well as the consideration of mitigation measures and alternatives more generally, in view of the need to minimize emissions of GHGs.
431. The Panel notes that Bank policies applicable to the Medupi project include provisions to adequately assess and mitigate the potential negative impacts of a project. OP 4.00, Table A1, states that potential impacts include "*transboundary and global concerns*"

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<sup>226</sup> See the South African Government's Response to Questions on the Eskom Loan Application to the World Bank, available at: [http://www.treasury.gov.za/comm\\_media/press/2010/2010040701.pdf](http://www.treasury.gov.za/comm_media/press/2010/2010040701.pdf).

(see Chapter 4 above). As stated above, these principles are reflected in South Africa's NEMA.<sup>227</sup>

432. Furthermore, OP 10.04, para. 8 notes that a project may have “*domestic, cross-border or global externalities*”, and defines global externalities to include “*emissions of greenhouse gases*.” It further provides that such global externalities, except under certain situations, “*are fully assessed (to the extent tools are available) as part of the environmental assessment process and taken into account in project design and selection*.” In addition, as also noted above, several Bank policies contain the requirement to consider feasible and available project-level alternatives that could reduce potentially significant harmful impacts of a project while meeting basic project objectives.
433. The Panel notes that climate change presents serious, potentially catastrophic risks.<sup>228</sup> The 2011 Human Development Report<sup>229</sup> observes that the health risks posed by climate change “*are immense and diverse*” due to increased risk of extreme weather events, rising sea levels and changing dynamics of infectious disease due to higher temperatures (p. 53). Rising sea levels will displace people and inundate low-lying lands; island countries and coastal zones with a low elevation are seriously threatened, and in some cases entire populations are at risk (p. 36). Millions of people who fish for a living will be threatened due to impacts on fish and marine resources (p. 4). Indigenous populations will face serious risks as they “*often live in ecosystems particularly vulnerable to climate change*” (pp. 54-55), and climate change plays an increasing role in loss of species and biodiversity (p. 38). The report concludes that the impacts will be especially hard on the poor: “*[i]n sum, the poorest countries bear many of the costs of climate change, and the prospect of worsening global inequality is very real*.” (p. 37).
434. Like other countries, South Africa is vulnerable to climate change. The recently developed PAD by Bank Management for the Eskom Renewable Support Project states that climate change “*already negatively impacts human health, agricultural production, plant and animal biodiversity, water resources, rangelands, human settlements, infrastructure and disaster management capacity in the country*.”<sup>230</sup> This PAD also notes that South Africa itself contributes over 1% of global CO2 emissions, higher than its share of the global population and economy.
435. In line with the claim presented to the Panel, and the relevant issues of policy, the discussion below first considers: Did the Project adequately consider and adopt technology and policy measures to control and mitigate GHG emissions; and then, did

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<sup>227</sup> Chapter 6 of the NEM Air Quality Act 39 of 2004 provides for the Minister to investigate and prescribe measures to control air pollution across South Africa's boundaries that may have a significant detrimental impact on air quality, the environment or health in a country, and/ or violates, or is likely to violate, an international agreement binding on the Republic in relation to the prevention, control or correction of pollution (s50(1)(b)). The contents of atmospheric emission licenses ‘must specify’ greenhouse gas emission measurement and reporting requirements (s43(1)).

<sup>228</sup> See the IPCC 2007 Report, the 2011 UN Human Development Report; the 2007/8 UN Human Development Report, the Stern Review (2006), and Statements from the G8+5 nations in advance of the UNFCCC Meeting in Copenhagen (2009).

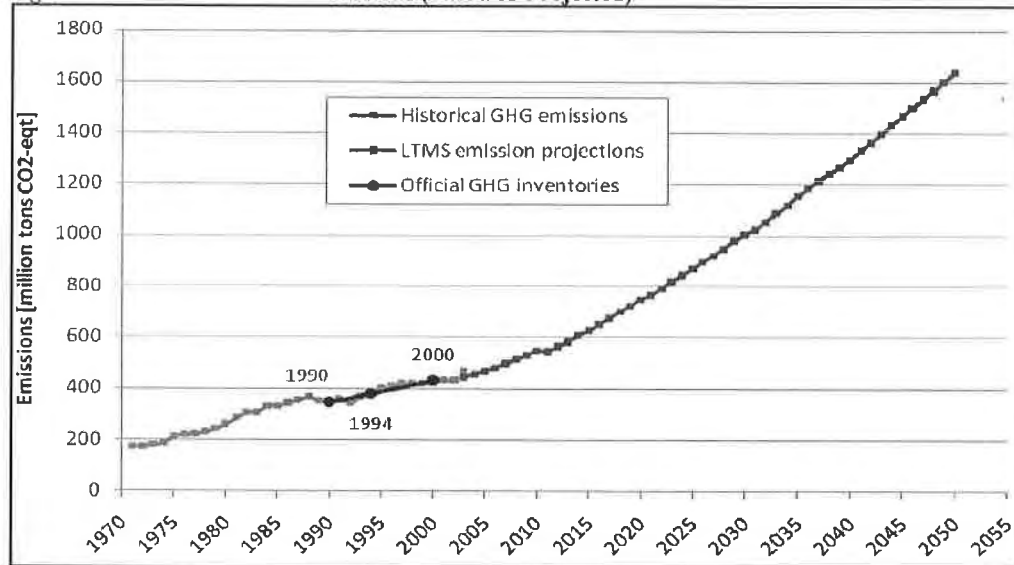
<sup>229</sup> United Nations Development Programme, Human Development Report 2011, “Sustainability and Equity: A Better Future for All”, 2011.

<sup>230</sup> PAD, Eskom Renewable Support Project (Report No: 64634-ZA), October 3, 2011, p. 2, para. 6.

the Project adequately consider viable alternatives to the Project to reduce these pollutants in light of Project objectives?

436. **First, did the Project adequately consider and adopt technology and policy measures to control and mitigate GHG emissions in line with Bank Policy?** Here the Panel examines the issue of the cumulative carbon emissions from EISP. The best available CO<sub>2</sub> emissions baseline for South Africa is shown in Figure 1 using projections based on GoSA's Long-Term Mitigation Scenarios (LTMS), which rely on the latest development scenarios, modeling tools, and data.<sup>231</sup> During the next two decades (2010-30), South Africa's emissions are projected to grow by about 500 to 1,000 million tons per year of CO<sub>2</sub> equivalent. To this overall growth, Medupi would contribute about 30 million tons per year (or 6% initially and declining over the period).

**Figure 1: South Africa GHG Emissions (Past and Projected)**



Sources: Thapelo Letete, Mondli Guma and Andrew Marquard, *Information on Climate Change in South Africa: Greenhouse gas emissions and Mitigation Options*, Energy Research Centre, University of Cape Town, 2009; LTMS=Long term mitigation scenarios, (DME Study).

437. Table 8 of the PAD summarizes a number of climate change mitigation efforts under the Project. It highlights gains through demand-side management (DSM) efficiency improvements and a renewable energy feed-in tariff (REFIT).<sup>232</sup> The PAD states (para. 169), "As shown in Table 8, CO<sub>2</sub> emission savings from the GoSA DSM program and the REFIT renewable energy program exceed the incremental emissions from the Medupi Power Plant for the life of the coal-fired power plant."

<sup>231</sup> ERC (2007), LTMS Study.

<sup>232</sup> Both the DSM and REFIT programs are GoSA initiatives. The feed-in tariff is a method of encouraging growth in renewable energy sectors by setting a fixed price for renewable power and guaranteeing sustained priority grid access for generators supplying renewable power (see Dewey and LeBoeuf presentation on South Africa's REFIT Program). The DSM program, led by Eskom, is an approach to integrating and optimizing energy use so that consumption can be matched with supply, ensuring better grid health.

**Table 1: CO<sub>2</sub> Emissions – Medupi Power Plant v/s GoSA REFIT & DSM Programs**

	DSM program		Renewable energy program (REFIT)		Total [2]+[4]	Medupi Net CO <sub>2</sub> emissions	Net impact [5]-[6]
	Energy	Avoided CO <sub>2</sub> emissions	Energy	Avoided CO <sub>2</sub> emissions			
	GWh	Mtpy	GWh	Mtpy		mtpy	mtpy
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
2009	428	0.4	0	0.00	0.4		-0.4
2010	662	0.7	500	0.52	1.2		-1.2
2011	1,156	1.2	1,000	1.03	2.2		-2.2
2012	3,058	3.1	2,000	2.06	5.2	2.4	-2.8
2013	5,291	5.4	4,000	4.12	9.6	7.2	-2.4
2014	7,140	7.4	6,000	6.18	13.5	11.5	-2.0
2015	8,782	9.0	8,000	8.24	17.3	15.6	-1.7
2016	10,477	10.8	9,000	9.27	20.1	16.7	-3.3
2017	12,172	12.5	10,000	10.30	22.8	16.7	-6.1
2018	13,867	14.3	10,000	10.30	24.6	16.7	-7.9
2019	15,562	16.0	10,000	10.30	26.3	16.7	-9.6

Source: Table 8, PAD, p. 52.

438. The Panel's expert believes, however, that interpreting the results of PAD Table 8 (duplicated above) in this manner could be misleading, because the REFIT program does not actually reduce Medupi GHG emissions. Renewable growth incentivized by REFIT will certainly avoid emissions from future carbon-intensive energy development, but it was not devised specifically to mitigate the emissions from Medupi. Emissions reductions can only be attributed to low carbon energy sources when those sources are being developed *in lieu* of more carbon emitting energy sources. They cannot be counted as offsets if they are unrelated. In other words, the comparison offered in PAD Table 8 emphasizes that Bank-financed emissions will be offset by independent GoSA programs, but fails to demonstrate adequately that the Project appropriately addresses its own externalities. In this light, the Panel, based on expert opinions, questions the conclusion presented in the PAD on net GHG emissions.
439. Apart from this, the Project includes mitigation measures in the form of technologies applied to Medupi Power Plant itself to reduce its GHG emissions. The PAD states that Eskom's choice of super-critical technology "*will result in an emissions savings of about 150 million tons (based on Eskom proposed new coal plants) over this (2010-30) period, when compared with a coal-fired power plant using sub-critical technology*" (PAD: para. 152). As noted in the PAD, the decision to use this technology was made by Eskom in 2006, independent of Bank engagement.
440. Another technology consideration with potential implications for greenhouse gas emissions from the power plant itself is Eskom's choice of wet FGD versus semi-dry or dry FGD technology to control sulfur emissions from Medupi. The Panel expert notes that the difference in carbon emissions among the FGD technologies is small, at 1-2% of total emissions from combustion, and that therefore the choice of wet FGD technology does not make a significant change to Medupi's GHG emissions profile.<sup>233</sup>

<sup>233</sup> Other implications of this technology choice are addressed elsewhere in this report.

441. The PAD further argues that the Bank and Clean Technology Fund support for the EISP components covering CSP (solar) and wind power activities will give a strong boost to the renewable energy programs envisaged in the Government's Long-Term Mitigation Scenarios, and that the EISP components focusing on railway electrification and supply-side efficiency will also support the GoSA's low carbon strategy. The PAD (para. 144) states that *"The project is consistent with the South African LTMS and its global strategy of supporting climate change mitigation, which defines the path of the energy sector for a low carbon economy."* The PAD further asserts that *"the proposed project would strongly support interventions on mitigation of climate change"* (PAD: para. 65).
442. Nevertheless, these efforts noted in the PAD are also in the context of a major increase in GHG emissions from Medupi, as well as the potential lock-in effects of continued coal-dependence in South Africa's Integrated Resource Plan (IRP). In addition, the Panel notes that the Bank's financing with its own resources for EISP consists of US\$ 3.04 billion for Medupi (Component A of the Project) and US\$ 260 million for the two renewables in (Component B). The Bank also is administrator of a Clean Technology Fund (CTF) loan of US\$ 250 million for renewables (also related to Component B).<sup>234</sup> The Project thus provides important support to renewables, but it also results in a far larger investment of Bank resources into the Medupi coal-fired power plant.
443. As noted previously, Table A1 of OP 4.00 includes the key operational principle to *"prevent, at least minimize, or compensate for adverse project impacts and enhance positive impacts through environmental management and planning..."* South African's national environmental management principles (NEMA s2) similarly requires measures to avoid, or minimize and remedy, adverse impacts, and a strict mitigation hierarchy to avoid impacts that could undermine sustainable development and, where these impacts cannot be *"altogether avoided,"* to *"minimize and remedy"* (emphasis added) these impacts (NEMA: s2(4)(a)).
444. **The Panel finds that steps have been taken to adhere to this policy framework, including selection by Eskom of super-critical technology, financing of the Majuba Rail Project, and financing of renewables as part of the Project.** The Panel considers that these efforts constitute an important recognition of other options available to provide electricity and reduce negative externalities in the context of the critical need for power to support development in South Africa.
445. Nevertheless, the magnitude of emissions from Medupi far outweighs emissions avoided by these measures. **The Panel notes that the description of the net results of mitigation efforts under the Project fails adequately to demonstrate that the Project is directly addressing its own externalities.**
446. In addition, a major corollary to the mitigation measures and programs is the need for follow-up--that is, the Bank's responsibility to continue supporting the capability and willingness of the GoSA to deliver on the mitigation components in the EISP in the near term, and to move towards a lower carbon future in the longer term (e.g., as envisaged in the LTMS).

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<sup>234</sup> The CTF loan was approved by the Bank's Board of Executive Directors on October 27, 2011. This is the first CTF loan in Sub-Saharan Africa.



447. **Second, did the Project adequately consider viable alternatives to the Project to reduce GHG emissions, in light of Project objectives and in line with Bank Policy?**
448. Bank policy requirements raise the important question of how to construct the most realistic “without-Medupi scenario” for GHG emissions. The Panel’s expert notes that any feasible alternative to Medupi would also give rise to GHG emissions, and that the mitigation measures associated with EISP need to be evaluated against such alternatives. As noted above, Medupi is projected to contribute around 30 million tons per year of GHG. The Panel also notes that a key underlying issue for this analysis is that Bank Management received the request for the loan at a time when the Project was already underway. This is addressed in Chapter 6.
449. In the absence of Medupi, energy or electricity would have to be provided through alternatives. According to the PAD (Annex 9, paras. 27-29), one alternative would be liquefied natural gas (LNG) combined-cycle power plants. The net increase in GHG emissions from Medupi, compared to the LNG alternative, would be 13.3 million tons per year. A second alternative is self-supplied power (candles, kerosene, batteries, and other sources for domestic use, and diesel generators for industrial or commercial use). Compared to this alternative, the net increase in emissions from Medupi is estimated at 12.8 million tons per year of GHG. In the latter case, however, economic and social costs of shortages as well as local air pollution are very significant (PAD, Annex 9 Economic Analysis, para 27; see also below). Other potential energy supply options include hydro and other renewables, nuclear power, and measures that reduce demand so that the amount of supply needed is reduced.
450. World Bank consultants prepared an economic analysis for Medupi<sup>235</sup> to supplement Eskom’s analysis. This report provides the basis for the PAD’s estimates of the impact of GHG emissions on the least economically costly alternative to Medupi. The estimates provided in the PAD, taken from the Medupi economic analysis and based on data used in a widely accepted review (Stern Review, 2007), indicate electricity production costs plus global carbon damage costs for different generation alternatives, including Medupi. They show that carbon damage costs add to production costs by US\$ 29 to US\$ 85 per ton of CO<sub>2</sub> for each generation option. According to the PAD, if carbon damage costs are priced at US\$ 29 per ton CO<sub>2</sub>, only the hydro alternative (Inga III or Grand Inga on the Congo River in DRC) has a lower cost than Medupi. At a damage cost of US\$ 85 per ton CO<sub>2</sub> (the “upper end of the damage valuation in the Stern review”), only the Inga and nuclear alternatives are cheaper—but other considerations, such as timing and financing costs—definitely rule out the latter two.<sup>236</sup> In this light, the PAD concludes that “...the proposed Medupi Power Plant is the least cost alternative available to South Africa for development” (PAD: p. 168).<sup>237</sup>
451. Going beyond the US\$ 29-85 price range, the PAD estimates a shadow price of US\$ 105 per ton of CO<sub>2</sub> for CCGT-LNG (the next alternative that is feasible in the required time

<sup>235</sup> Meier, P., 2010, “Medupi Economic Analysis,” February (hereinafter referred to as “Medupi economic analysis”).

<sup>236</sup> See PAD, page 168, para. 20 and also providing cost data through “shadow” prices for CCGT-LNG.

<sup>237</sup> Elsewhere, the PAD notes that under the 2009 IRP the least-cost reference expansion plan results in construction of coal-fired and nuclear power stations to meet the demand over the planning horizon. It states that, “This outcome is not surprising given the relative low cost of coal-fired power stations and high domestic reserves of coal to meet future demand as well as low cost of coal” (PAD: Annex I, para. 66).

frame). CCGT-LNG has an energy production cost of US cents 9.5 per kWh (64% higher than Medupi), and GHG emissions amounting to about 50% of Medupi's emissions. The next feasible alternative would be CSP (solar), which has a shadow price of US\$ 115 per ton CO<sub>2</sub> and production cost of US cents 14.8 per kWh (more than 2.5 times higher than Medupi). The PAD data (PAD: Annex 9, Table 1 and paras. 15-20) indicate that other alternatives are progressively more economically costly.

452. In this context, another key argument is that without the Medupi Power Plant, or the provision of a similar amount of capacity from other sources, South Africa would have faced severe issues of energy insecurity and power shortages. The PAD notes that the economic and social cost of inadequate electricity supply is “*unacceptably high*” (PAD: para. 31) due to outages and need for more self-generation, and summarizes the loss of GDP due to power shortages (para. 29). More generally, several decades of research in both developing and developed countries have confirmed that power outages and an unreliable power supply have disastrous consequences for the economy; the resultant costs are usually several-fold larger than the cost of supplying reliable power (Munasinghe, 1990; Woo and Pupp, 1992).<sup>238</sup>
453. The Panel notes that the lead author of the report referenced by the PAD to calculate damage from carbon emissions (Stern Review, 2007) has recently indicated that the report's findings underestimate the costs of carbon damage.<sup>239</sup> The Panel does not fault Management for using the earlier figures, which were widely endorsed at the time. In fact, Management included in its GHG analysis in the PAD a box recognizing that the research on the social cost of carbon is “*large and growing*” (PAD, Box 1, p. 171). The new information is reflective, however, of the larger issue of adequately accounting for impacts of GHG emissions and global climate change, particularly with respect to investments that will be in place for decades.
454. In sum, the externality relevant in this section of the Panel's evaluation consists of GHG emissions. When this externality is added to the base production costs for different generation sources, the PAD concludes, as indicated above, that Medupi is the “*least-cost alternative*” within the time frame needed to meet demand growth, even after GHG externalities (over a reasonable range of values) are included.
455. This conclusion is based on certain assumptions about the timing and level of energy demand in the country.<sup>240</sup> It also focuses solely on cost factors associated with electricity production costs and the externality of GHG emissions; whereas other factors and negative externalities associated with Medupi must also be considered in examining Project alternatives under Bank policy. It should also be noted that conventional least-cost analysis is usually based on the costs to the borrower/host country, whereas carbon damage costs include global social costs that will be borne mainly by people outside the country.

<sup>238</sup> More references are available at: [http://www.sciencedirect.com/science?\\_ob=ArticleListURL&method=list&ArticleListID=1752137565&view=c&acct=C000050221&version=1&urlVersion=0&userid=10&md5=6d61fba15dc5ff8ce47670625e482202&searchtype=a](http://www.sciencedirect.com/science?_ob=ArticleListURL&method=list&ArticleListID=1752137565&view=c&acct=C000050221&version=1&urlVersion=0&userid=10&md5=6d61fba15dc5ff8ce47670625e482202&searchtype=a)

<sup>239</sup> Interview with Lord Nicholas Stern, 2011. Technology Review: MIT Publication of July/August 2011. (Lord Stern notes that the science looks more worrying now, and suspects that the costs of the impacts of unabated climate change are greater.) See also remarks of Lord Stern at the World Bank, July 14, 2011.

<sup>240</sup> According to page 13 of the PAD, the South Africa Power Pool (SAPP) expansion plan calls for the installation of 9,200 MW of base load capacity by 2015 and 18,800 MW by 2025.

456. **The Panel finds that Management acted consistently with Bank policy in preparing an extensive analysis in the PAD on the issue of GHG externalities, and notes that this analysis is additional to the information provided in the Medupi EIA.**
457. **The Panel notes, however, that this is not a complete analysis of alternatives, as it focuses only on electricity production cost and the externality of GHG emissions.** The Panel's overall assessment of Management's actions with respect to Project externalities and the economic analysis is set forth elsewhere in this Chapter and in the next. The discussion takes into account a broader set of project externalities in addition to GHG emissions, including in particular impacts on air and water resources, and considers the assessment by Management of other alternative project scenarios in light of the Project objective. **The Panel notes in this regard that Bank policy, and corresponding provisions of South African law, does not focus narrowly on "least cost" as referred to in the PAD, but on whether there are other feasible alternatives available that could meet project objectives and reduce or avoid significant externalities and impacts.**
458. **In addition the Panel has identified certain important issues and concerns in relation to GHG costs.** The Panel notes that the figures in the PAD, although adequate at the time of appraisal and through no fault of Management, may have underestimated the costs associated with damage from CO<sub>2</sub> emissions. This concern becomes greater when emissions are looked at in a cumulative context. The Panel raises this as a point deserving serious attention in the analysis. It also points to a more systemic concern about how to deal with this type of global issue effectively in the context of long-term project activities where risks may be rising.
459. Moreover, the Panel notes that Management's comparisons are based on current costs, whereas the costs of CSP, wind power, and photovoltaics are continuing to decline significantly relative to coal.

**c. Bank strategy on climate change and for renewable energy**

460. The Request for Inspection claims that Bank support for the Project is not consistent with the Bank's strategy relating to climate change.
461. As noted in Chapter 1, it is not the role of the Panel to judge the consistency or "compliance" of a Project with Bank "strategy" documents, as these are not operational policies and procedures of the Bank. The Panel does consider, however, whether Project documents accurately assess the potential impacts and risks from a project, in compliance with Bank operational policies (as described earlier in this Chapter) and in support of informed decision making.
462. The Panel notes, in this regard, the statement by Management early in the PAD for the Project, that *"The present project, as well as the longer-term partnership envisaged between the government of South Africa and the World Bank will enable the country to achieve a low carbon trajectory."*
463. The Panel considers that the broad statement early in the PAD is not easily justified, and unfortunately may convey an overly optimistic view of the Project on this matter. The statement in the PAD to the Board should not be divorced from its consequences, which are a broad shared concern of the GoSA and the international community. The Panel is

concerned, in this regard, that Management has overstated the weight of mitigation measures, thereby not adequately recognizing or addressing the issue posed by the magnitude of Medupi's net emissions.<sup>241</sup> As noted previously, along with the measures for mitigation included in the Project, and along with its significant benefits for electricity generation and development, Medupi will emit and lock in significant levels of GHG emissions for many years, with larger impacts when viewed on a cumulative basis.

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<sup>241</sup> Also the Panel understands that the RESA in preparation notes that South Africa's emissions of GHGs will increase significantly with the large scale development of coal-based energy projects.

## **Chapter 5: Compliance Analysis at Project Level: Social, Economic and Other Claims**

464. This Chapter continues the Panel's analysis and findings on issues of compliance and harm at the project level. It focuses, in particular, on claims in the Request that relate to social and economic issues, including livelihoods and poverty reduction, and cultural heritage and practices, as described in Chapter 1 of this Report. The analysis refers back to the same policy framework as outlined in Chapter 4, and builds on the issue-specific discussion of impacts and externalities of the Project in that Chapter.
465. The Chapter also includes the Panel's findings on compliance and harm in relation to two cross-cutting issues raised by the Request: the economic assessment of the Project's costs and benefits, including its externalities; and the review and analysis of Project alternatives on the specific claim of whether there was a proper analysis of "alternatives to coal".

### **A. Impacts from an Influx of Laborers**

466. The discussion below presents the Panel's analysis on claims raised in the Request that the Project will have adverse effects on local communities and overwhelm local services due to the influx of people and workers for the construction, and to the effects of other new activities and development linked to Medupi. (Claim number 5).

#### **1. Requesters' Claims and Management Response**

467. In several meetings during the Panel's field visits with local residents, representatives of the African and White communities expressed concerns about social and environmental effects of labor migration to the area in relation to the Medupi Power Plant. The Request refers to the consequences of "*a significant expansion of mining in the area,*" and other local stakeholders whom the Panel met referred to the cumulative effects of all new industrial activity on local public services, communal health, and security.
468. Management acknowledges that the expanded workforce will put pressure on housing and municipal infrastructure and services, and that increases in sexually transmitted diseases and social conflict can occur. However, Management states, in relation to associated coal mining at Grootegeluk Mine, that "*the amended EMPR contains measures to address these impacts*" (MR: p. 26).

#### **2. Panel Observations on Harms Alleged in the Request**

469. In 2006, the local government predicted that the population would increase by about 15% over the next six years, but added a word of caution: "*There is a lot of speculation about new development which is envisaged for Lephalale. The statistics as captured can therefore change drastically. All the information is not yet available but is unfolding in pieces*" (Lephalale IDP, 2007/2008). The Panel was informed that the ongoing construction of the Medupi plant engages a workforce totaling about 9,000, with more

than half not coming from the local area.<sup>242</sup> In addition, a substantial number of unregistered job seekers have come to the area.

470. The Lephalale municipality experiences “*Huge backlogs in service infrastructure and networks in the underdeveloped areas*” that “*(...) require municipal expenditure far in excess of the revenue currently available within the local government system*” (Lephalale Municipality, 2006). Also, the Municipality states that the Medupi Power Plant “*is already putting pressure on the municipality for the provision of more potable water, electricity and expansion of waste water treatment systems. The influx of people from surrounding areas and outside the municipality has lead to a growth in informal settlements. The municipality has forged good relations with traditional authorities under which the majority of residents are staying in communal land*” (Lephalale IDP, 2010-2011, p. 15).
471. According to the first supervision report for EISP<sup>243</sup>, Eskom is investing in housing construction, electricity supply, and sewage systems in the Marapong and Lephalale communities. The Panel was also informed that Eskom contributes to the municipal revenue in the form of property tax on land and structures. Property tax currently supplies about 10% of municipal revenue, and the Panel understands that the Medupi development would not directly result in any major increase in the municipal authority’s revenue base. However, in a meeting with the Municipality Manager, it was explained that the municipality expected to benefit from various social investments of corporations such as Eskom and Exxaro. A Lephalale Development Forum has been established to this effect and to facilitate dialogue between major development stakeholders.
472. Industrial development of the scale envisaged for the Lephalale area represents a major challenge for a small and under-resourced municipal administration. It raises the issue of whether local authorities will be able to muster the required financial and human resources to cope with the rapid expansion in the number of job seekers to the area as a result of both Medupi and associated coal mining.
473. The EIR (p. 414) identifies the following adverse social impacts related to the new industrial activities brought in by the Medupi investment:
- “***Influx of job seekers.*** *Because of high unemployment rates in the region, it is possible that news of the proposed development could lead to an influx of job seekers into the area.*”
  - “***Impacts on the local municipality.*** *It was determined during the scoping study that the power station would bring about a significant increase in the demand for housing and infrastructure in the surrounding area. This increase would have a substantial impact on the local municipality.*”
  - “***Impacts on public safety and daily movement patterns.*** *It was determined that the construction and operation of the power station are likely to result in an increase in traffic volumes. This could lead to damage of local roads and*

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242 According to the First Supervision Back-to-Office Report for EISP, 4,700 of the 8,300 construction workers were not from the Lephalale area.

243 EISP First Supervision Back-to-Office Report, 26 October through 4 November 2010.

*increased speeding through town, thereby impacting on the safety and daily movement patterns of residents in surrounding communities.”*

474. The EIR states that conflict might arise between the newcomers and local residents from the perception that *“outsiders are taking up jobs that could have gone to unemployed members of the local community”* (EIR: Section 15.5.3). Informants to the Panel mentioned growing animosity against immigrants coming to the area. The Municipality, according to informants, has not been able to prevent the establishment of new informal settlements.
475. The same section of the EIR notes that *“[A]n influx of construction workers and job seekers might be accompanied by an increase in crime. Even if particular instances of crime are not as a result of the newcomers, they may still be attributed to them by local communities.”* This concern was also corroborated by the Panel’s interviews.
476. Evidently, pressure will increase on existing public services and infrastructure and, according to the EIR, substantial new investments will be needed in access roads, water, sanitation, housing, health care, and schools. *“Meeting these demands will imply significant capital expenditure on the part of the municipality. In view of the fact that the municipality already suffers from a lack of funds, it would be essential that discussions between Eskom and the Local Authority are initiated. Agreement would need to be reached regarding mandates and responsibility for issues relating to the upgrading of infrastructure and the allocation of land for housing”* (EIR: pp. 431-2).
477. **Cumulative impacts.** The Panel’s investigation has highlighted that the additive impacts of labor for Grootegeeluk Mine and Medupi Power Plant would place cumulative pressure on public infrastructure and services--which in turn has potential to exacerbate impacts on both air quality and water resources where infrastructure and services (e.g. health, access to electricity, access to clean water and sanitation) are inadequate.
478. The Panel notes that the potential risks in terms of deterioration of public services, public health problems, environmental degradation, and increasing crime and social unrest are very real. The key question for the Panel is whether these risks were adequately considered in the Project’s EIA, and whether adequate mitigation measures were identified to enhance the financial and manpower capacity of the Lephalale municipality.<sup>244</sup>

### 3. Panel Analysis and Findings

479. The Panel notes that the EIR confirms that the Medupi plant has major socioeconomic implications and, potentially, impacts of *“high significance”* on public infrastructure and services (EIR: Sections 15.5.2-15.5.4). The EIR rates the significance of *“change in local infrastructure requirements”* as *“high”* in the construction and operational phases of the project (EIR: Section 15.5.4), and the significance of social problems arising from

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<sup>244</sup> The PAD states that key concerns identified beyond the mine site boundaries are *“increased water use, traffic and traffic hazards, possible exposures to dust on two adjacent farms, and indirect effect of expanded employment such as pressure on local infrastructure and housing due to a larger workforce, and elevated incidence of HIV/AIDS and other sexually transmitted diseases associated with an influx of workers and job seekers. The recommended amendments to the EMPR address all of these impacts”* (PAD, pp. 72-73).

an influx of people as “moderate”. The mitigation potential of both impacts is rated as “moderate”.

480. The Panel finds that the mitigation measures given in the EIR lack specificity. The main mitigation measure identified is *“timely negotiation with the Local Municipality, the LSDSC, and the LDC to identify resources required to meet increased demand for services, infrastructure, and land for housing and to discuss possible support by Eskom to the municipality”* (EIR: p. 433). The Panel further notes that the EISP RoD makes little reference to responsibilities of Eskom for addressing effects on public services or infrastructure, other than to state that the siting and management of construction camps, sanitation, ablution and housing facilities, as well as all recommendations and mitigation proposed in the EIR, must be addressed in the EMP.
481. The Panel finds that the influx of workers is a key concern in the Grootegeeluk Mine expansion EMPR<sup>245</sup>, together with pressure on local housing and public services infrastructure (EMPR: p.42-43). However, no specific mitigation measures to address these impacts are given, other than to ensure appropriate accommodation and consult with the local authorities/ municipality.
482. Impacts of the Medupi Power Plant on public infrastructure and services were raised as issues by stakeholders during the EIA process, as recorded in the SDR Summary of Stakeholder Consultations (SDR: Annex 5, Issues 46, 51); so was the lack of financial and human resources of the Lephalale Municipality to cope with the added burden. The failure of the RoD to include conditions addressing these impacts was expressed as a concern (SDR: Annex 5, Issues 46, 51).
483. The Panel finds that a number of issues raised in public consultations, and identified in the Issues Trail, have been inadequately addressed in the EIR. They include the assessment and mitigation of impacts on roads, water supply and reticulation, sewerage and sewage treatment works, housing<sup>246</sup>, waste management and disposal<sup>247</sup>, clinics and health services, and schools. Impacts of the Medupi Power Plant on public infrastructure and services were raised as issues by stakeholders during the EIA process and in the SDR review (see SDR: Annex 5, Issues 46, 51), as was the lack of financial and human resources of the Lephalale municipality to cope with the added burden. The failure of the RoD to include conditions addressing these impacts was expressed as a concern. The inability of the existing waste dump and sewage treatment works to cope with current

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<sup>245</sup> An estimated 1000 workers during construction and 350 during operation.

<sup>246</sup> There is “enormous” demand for housing in Lephalale: a backlog in 2007 of 20,575 houses. Informal settlements exacerbate service delivery problems. Waterberg District Municipality, 2010, p. 13. The Municipality has indicated that it does not have land for additional housing developments. Synergistics Environmental Services, 2006, p.19.

<sup>247</sup> Activities applied for in the Medupi project include sewage treatment plants and storage facilities for dangerous or hazardous substances controlled by national legislation. T (pp.78-79) that “the management of all types of waste” will be considered within the EIA, no description of either activity is given, and associated impacts are not addressed. According to the Issues Trail hazardous waste would be “stored in an approved place at the power station and would then be disposed of at the Holfontein landfill site in Gauteng. The domestic waste would be disposed at the existing municipal landfill site.” It was noted that this landfill site was not licensed. The Issues Trail also states that “comprehensive recommendations” regarding domestic and hazardous waste management and disposal will be made in the environmental management plan (EIR: Issues Trail, pp. 86 and 79 respectively). The EMP does not provide comprehensive guidance or indicate sites for disposal of either type of waste.



loads, as well as the poor state of roads--due largely to construction traffic to and from Medupi--was raised in interviews with the Inspection Panel.

484. The Panel's expert considers that the NEMA principles have not been adequately applied in the assessment and implementation of the Project in respect to this issue, and information on which the assessment is based is unreliable.<sup>248</sup> These principles include those relating to responsibility for pollution<sup>249</sup> and environmental<sup>250</sup> degradation, and consequent adverse health impacts, and environmental justice.<sup>251</sup>
485. In view of the above, the Panel's assessment is that the issue of impacts of the Medupi Power Plant on the local municipality and public services for which the Municipality is responsible is serious, and potentially detrimental to the rights and interests of the Requesters. The EIA did not adequately identify mitigation measures commensurate with its conclusion of impacts of "*high significance*" on public infrastructure and services, as required by OP/BP 4.00 and relevant NEMA principles.
486. Although the EMPR is relatively thorough in its analysis (e.g. skills audit, employment over time, breakdown of temporary vs. permanent employment, etc), and in identifying potential impacts (e.g. pressure on services), it is similarly silent on specific mitigation measures for these impacts. Like Medupi, mitigation relies largely on "*consulting with local authorities*" to find workable solutions. Furthermore, the cumulative impacts of both the Medupi plant and expansion of the Grooteegeluk Mine on public infrastructure services were not addressed. **The EMPR for expansion of the Grooteegeluk Mine is similarly silent on specific mitigation measures for these impacts. Management's acceptance of the EIA with these shortcomings is not consistent with OP/BP 4.00.**
487. Although Eskom is investing in a number of important areas, the Panel considers that measures to mitigate and compensate for negative impacts on public services and infrastructure should have been based on better identification and assessment of specific harms. The Panel further considers that reliance on piecemeal negotiations with the municipal authority for support in upgrading already ailing infrastructure is unreliable and inadequate, and not consistent with the NEMA Principles—particularly the principle that the costs of remedying pollution<sup>252</sup>, environmental<sup>253</sup> degradation and

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<sup>248</sup> For example, at the peak of the construction phase of the project, 2,000-3,000 people (Scoping Report Issues Trail: p.25), 5,000 (EIR 15.5.1), or 5,000-8,000 (EIR: Issues Trail, Section 15.5.3, p. 33) would be employed. According to Eskom's Medupi Power Station information leaflet and video, 9,000-10,000 people would be employed on site.

<sup>249</sup> Defined as '*any change in the environment caused by substances,...noise, odors, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future*'.

<sup>250</sup> Defined as '*the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth, micro-organisms, plant and animal life, any part or combination of... and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being*'.

<sup>251</sup> Regarding environmental justice, equitable access, the person responsible for pollution, environmental degradation or adverse health effects having to pay, and the requirement to minimize and remedy negative impacts, as shown in Addendum 1.

<sup>252</sup> Defined as "*any change in the environment caused by substances,...noise, odors, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on*

consequent adverse health effects, and of preventing, controlling, or minimizing further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.<sup>254</sup>

488. The consequence is that project impacts are being externalized and there is a high risk that the responsibility for addressing them will fall to an under-capacitated Lephalale Municipality. As noted in the EIR (Section 15.5.3, p. 432), “(...) *the municipality already suffers from a lack of funds.*”

## **B. Cross-Cutting Issue: Inadequate Analysis of Project Externalities**

489. In carrying out its compliance analysis on those allegations of harm related to impacts on air pollution and health, water availability and quality, climate change, and pressures on local infrastructure and services, the Panel examined the economic analysis of the Project prepared by the Bank to assess whether the Bank had properly addressed the environmental and health-related externalities of Medupi, which derive from these impacts. This sub-section sets forth the Panel's analysis and findings in relation to this issue

490. **Policy.** As set forth in the section on Policy Framework in Chapter 4, OMS 2.20 (para. 13) states that “*Economic appraisal requires identification, quantification, and valuation of the costs and benefits likely to be associated with a project.*” In addition, OP 10.04 requires that the economic evaluation of a potential investment must take into account any domestic and cross-border externalities, and may take into account global externalities. OP 10.04 (para. 8) states that:

*“A project’s global externalities...are considered in the economic analysis when (a) payments related to the project are made under an international agreement, or (b) projects or project components are financed by the Global Environment Facility. Otherwise, global externalities are fully assessed (to the extent tools are available) as part of the environment assessment process and taken into account in project design and selection.”*

491. OMS 2.20 (para. 13) continues, “...these tasks frequently involve major conceptual and practical problems...” OMS 2.20 (para. 14) goes on to say: “*The extent to which the above problems complicate project appraisal varies a great deal among different sectors, so that the specific form of analysis for a project must be tailored to the “state of the art” in the respective sector.*” Thus, with respect to “Externalities,” OP 10.04 uses the language, “*The economic evaluation of Bank-financed projects takes into account [emphasis added] any domestic and cross-border externalities*” (para. 8) but it does not

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human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.”

<sup>253</sup> Defined as “the surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth, micro-organisms, plant and animal life, any part or combination of... and the interrelationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.”

<sup>254</sup> Regarding environmental justice, equitable access, the person responsible for pollution, environmental degradation or adverse health effects having to pay, and the requirement to minimize and remedy negative impacts as referred to in Chapter 3.

explicitly require their valuation unless the “state of the art” is generally considered appropriate to the task.

492. Paragraph 4 of OP 10.04, in the section on “Non-monetary benefits (costs)” states as follows:

*“If the project is expected to generate benefits that cannot be measured in monetary terms, the analysis (a) clearly defines and justifies the project objectives, reviewing broader sectoral or economy wide programs to ensure that the objectives have been appropriately chosen, and (b) shows that the project represents the least-cost way of attaining the stated objectives”*

493. **Relevant externalities.** The environmental and health-related externalities of key relevance in the Medupi Power Plant include potential air pollution (including SO<sub>2</sub> and GHG emissions), impacts on water quality and availability, and impacts relating to pressures on local infrastructure and services.<sup>255</sup> These claims raise issues at both the domestic and cross-border levels.<sup>256</sup>
494. **Air quality.** Changes to air quality can create health problems; both the increased mining activities and the Medupi Power Plant’s SO<sub>2</sub> emissions have the potential to adversely impact health (EIR: pp. 188-190).<sup>257</sup> The air quality risks are exacerbated by the risks associated with uncertain availability of water to operate the FGD units. Coal-fired power plants have been found to increase health risks for certain medical conditions and to reduce the productivity of people affected.<sup>258</sup>
495. Even if environmental costs are difficult to quantify and value, both OMS 2.20 and OP 10.04 require they be “taken into account” in the design and selection of project alternatives. While damages from air emissions continue to be difficult to estimate, the technology and methodologies for estimating non-marketed impacts have advanced significantly over the years. Chapter 7 of the World Bank *Handbook on Economic Analysis of Investment Operations* (World Bank, 1998) provides guidance on “Valuing Environmental Externalities,” and explicit examples of SO<sub>2</sub> damage valuation are available from other Bank operations.<sup>259</sup> Thus, Management could have calculated environmental damages from incremental emissions had these been judged relevant.
496. The Medupi economic analysis considers potential damages from incremental and cumulative emissions of SO<sub>2</sub> and particulates to be minimal, as a result of two assumptions: that prevailing winds blow away from population centers rather than toward them, and that FGD will be used to treat the flue gas emitted from the Medupi

<sup>255</sup> The Requesters’ Claims No. 1, 2, 5, 11, and 12 have a bearing on these issues.

<sup>256</sup> The PAD (para. 146, Section E (c. ii) and (c. iii)) rates “absent FGD” as a “substantial risk”, and water supply as a “moderate” risk to the Project, p.43.

<sup>257</sup> The mining, ashing, and plant operation will be associated with emissions that have the potential to negatively impact health. The emission of SO<sub>2</sub> and NO<sub>x</sub> undergoes secondary transformation processes which increase the concentrations of airborne particulates which can also pose further health risks. Epstein and others, 2011, p. 85. OMS 2.20: p. 13 includes health as a relevant factor to consider in the economic appraisal of a project.

<sup>258</sup> Clean Air Task Force, September 2010. “The Toll from Coal: An Updated Assessment of Death and Disease from America’s Dirtiest Energy Sources”.

[http://www.catf.us/resources/publications/files/The\\_Toll\\_from\\_Coal.pdf](http://www.catf.us/resources/publications/files/The_Toll_from_Coal.pdf)

<sup>259</sup> Such as the PAD for the Bank’s Shandong Power Plant Flue Gas Desulfurization Project (Report No. 38067-CN).

- Power Plant.<sup>260</sup> The economic analysis briefly discusses potential project benefits arising from forgone damages from the household, commercial, and industrial energy and lighting sources that would have been used in the absence of electricity from the project. But it does not value these benefits, nor does it provide cost estimates for the - presumably small or non-existent - potential damages from air quality degradation near the plant location.
497. **The Panel considers that the economic analysis should have included calculations of potential harm from air quality degradation in the area of the Medupi Power Plant and compared that harm with the reduced harm occurring in the counterfactual that was used in estimating the WTP for electricity (candles, kerosene, dry cells and captive generators).** These calculations should have focused on two categories of impacts from Medupi: (a) unmitigated incremental emissions occurring during the approximately three-year period when Medupi would operate without FGD, and (b) in later years, after FGD is fully operational, the incremental additions to cumulative airshed deterioration. **Thus, the Panel finds this aspect of the economic analysis to be non-compliant with the previously specified sections of both OMS 2.20 and OP 10.04.**
498. **Water resources.** Water is South Africa's "*most limiting natural resource*" (DEAT, 2008).<sup>261</sup> For this reason, the opportunity costs of water are likely to rise in the future; requirements for the treatment of wastewater are likely to increase (with cost implications) and there is a risk of the water supply becoming increasingly unpredictable and/or unreliable in light of climate change.
499. The economic analysis includes opportunity costs at R20 per m<sup>3</sup> for the six Mm<sup>3</sup> of water per year to be used in dry cooling and the additional six Mm<sup>3</sup> per year of water to be used to operate the FGD units. However, it does not include opportunity costs for the two Mm<sup>3</sup> of incremental water used each year by the Grootegeeluk Mine in supplying coal to Medupi. The sensitivity of the economic rate of return (ERR) is tested for increases in the opportunity cost of water, and the switching value<sup>262</sup> is presented as ">R200 per m<sup>3</sup>." **The Panel finds that the failure to cost the 2 Mm<sup>3</sup> of water per year required for expansion of the Grootegeeluk Mine does not comply with OMS 2.20 requirement that economic evaluation identify, quantify and value all costs and benefits likely to be involved in the project.**<sup>263</sup>
500. The analysis of risks focuses on probabilities of the switching values being exceeded and states that the potential impact on the ERR of higher opportunity costs of water is

<sup>260</sup> Among the "*Project (operation-specific) risks*" stated in the PAD (p. 43) are that "*Absent FGD, measures to mitigate sulfur-dioxide emissions from the power plants would not be consistent with World Bank environment health and safety guidelines for new thermal power plants, nor with South Africa's proposed emissions standards for new plants (Substantial)...*" and that "*Sufficient amount of water might not be available in time for the commissioning of the last three units or the FGD equipment (Moderate).*" Deteriorating water quality and SO<sub>2</sub> emissions can also cause loss and degradation of habitat resulting in species impact and loss. Epstein and others, 2011: p. 83.

<sup>261</sup> In 1966 a Commission of Enquiry into Water Matters identified water as a major constraint on future economic growth and national prosperity, establishing water resource management as a national strategic priority. Turton and others, 2004.

<sup>262</sup> Water cost at which the ERR would drop to the cutoff rate of 10%.

<sup>263</sup> While the water for the mine expansion was not included in the economic analysis, the Panel notes that the economic opportunity cost of water (Rand 20/M3) used in the remainder of the economic analysis appears "ample" in the sense of being almost triple the cost of current standards for desalinating water.

“vanishingly small” (Meier, 2010: para. 109).<sup>264</sup> Though the focus on price/value testing in this analysis of risks is inconsistent with discussion of risks at other points in the same paper and in the PAD,<sup>265</sup> it is consistent with the requirement of the OP 10.04 (para. 6) statement on “Risk,” i.e. that “...the Bank’s economic evaluation considers the sources, magnitude, and effects of the risks associated with the project by taking into account the possible range in the values of the basic variables and assessing the robustness of the project’s outcome with respect to changes in these values.” **The Panel finds that this approach to analyzing risks in the economic analysis is consistent with OP 10.04.**<sup>266</sup>

501. **Economic analysis of alternatives.** The economic analysis for Medupi shows the project’s ERR and Economic Net Present Value (ENPV) to be robust with respect to changes in key cost parameters such as the opportunity cost of water. Tests by the Panel’s expert reveal that this robustness extends to factors such as degradation in air and water quality.<sup>267</sup> On the other hand, this robustness would not be present in the economic analysis of alternatives, carried out according to OP 10.04 in which the sensitivity tests focus on the cost of each alternative, where the analysis would not be distorted by the output values resulting from previous errors in planning by the project implementing authority.<sup>268</sup> However, sensitivity testing of alternatives to Medupi did not include domestic and transboundary externalities.<sup>269</sup>
502. The analysis of alternatives presented in the PAD and in the underlying Medupi economic analysis (Meier, 2010) features only one sensitivity/switching value for externalities: that for GHG (carbon). It fails to present sensitivity tests of the choice of alternatives with respect to air quality and water externalities. In this regard, OMS 2.20 provides that:

*“Assessment of the sensitivity of the project viability to changes in the key parameters of the project, with a judgment on the likely variation from the basic assumptions. In addition, where there are large risks, further quantification of the risks through formal risk analysis is also desirable, and recommendations regarding precautionary measure which should be taken to reduce these risks (para. 17). For large and complex projects, consideration should be given to having a risk analysis to determine whether risks could be reduced by design changes.”*

503. As described in Chapter 4 (Climate Change), the Medupi economic analysis concludes that Medupi is the “least cost” alternative within the time frame needed to meet the

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<sup>264</sup> The opportunity cost of water, at R20/M3, amounts to less than 3% of the annual economic operating costs of Medupi at full development and less than 1% of annual benefits at full development, net of annual economic operating costs.

<sup>265</sup> This is a common problem found in the pricing of water and in the operation of water ‘markets’ in most countries.

<sup>266</sup> The Panel’s expert notes that this analysis highlights an ambiguity in the specific language used in the discussion of Risk in OP 10.04

<sup>267</sup> This robustness of the ERR and ENPV results from the willingness to pay for electricity being high because of pent-up demand from delays in expanding the system. Thus, at full development—in 2016 and afterwards—net annual benefits from Medupi are four times as large as gross annual costs.

<sup>268</sup> Incremental electricity should encounter similar willingness-to-pay values regardless of how it is supplied.

<sup>269</sup> OP 10.04, para. 6: “The main purpose of this analysis is to identify the scope for improving project design, increase the project’s expected value, and reduce the risk of failure.”

demand growth, even after GHG global externality costs (over a reasonable range of values) are included. The economic analysis conducts extensive testing of the effect of CO<sub>2</sub> damage costs on the choice of project alternatives but does not conduct comparable tests of the effect of domestic and transboundary externalities on the choice of project alternatives. The lack of these tests is consistent with a presumption that the domestic and transboundary externalities of the base case would be minor but inconsistent with previously presented Panel findings that domestic and transboundary externalities are likely to be major.

504. In sum, the Panel determined that the economic analysis contains an inadequate consideration of risks --in particular, with regard to water and air externalities-- associated with the choice of alternatives. The economic analysis includes extensive testing of the sensitivity of the choice of alternatives to CO<sub>2</sub> values but does not test for the sensitivity of alternatives to domestic and transboundary externalities associated with water availability and quality nor air quality degradation. **The Panel finds that this omission constitutes non-compliance with OMS 2.20. As a result, the Board did not receive important information for decision-making.**

### **C. Impacts on Livelihoods and Local Poverty Reduction**

505. This section presents the Panel's analysis on claims raised in the Request that the Project will have adverse effects on local livelihoods, including farming and ecotourism, and that it is not supporting Bank policy commitments to provide benefits to locally affected people and support poverty alleviation (Claim No. 3).

#### **1. Requesters' Claims and Management Response**

506. The Requesters claim that the Medupi Power Plant will have "detrimental" impacts on the livelihoods of people living in and around Lephalale because the industrial activity and pollution will negatively affect agriculture, livestock rearing, and ecotourism.
507. Management believes that none of the issues the Requesters raise related to livelihoods can be considered potential detrimental impacts (MR: p.23). The Management Response (p. v) states that the Environmental Impact Report (EIR) for EISP "adequately" identifies and addresses the impacts of the Medupi Power Plant on livelihoods and that Management is confident that mitigation measures are in place to avoid or minimize such impacts. Management says it reviewed the EIR and concluded that that report had adequately identified and addressed the Project-related impacts on people's livelihoods and on the environment in the Project area during the construction and operation of the Medupi plant, and that appropriate measures had been put in place to avoid or mitigate them.
508. Moreover, Management believes the Record of Decision (RoD) for the Project requires a monitoring system that includes representation of local communities. It does not provide any detailed analysis of this claim, though it urges consideration of the fact that GoSA has identified the Waterberg area as a priority area for industrial development and population growth.

509. More generally, the Management Response justifies the Project in terms of its positive contribution to poverty alleviation at the country-wide level: “(T)he Project will support the Government’s poverty alleviation efforts by avoiding electricity shortfalls in the medium term. Such shortfalls would slow down growth, cause significant job losses, and adversely affect the poor” (MR: p. iv).

## **2. Panel Observations, Analysis and Findings**

510. The normative policy framework applicable to the present Project contains specific provisions to achieve the objective of poverty reduction, and by implication to avoid impacts that would limit prospects for achieving this objective.
511. In the context of country systems, as applied through OP/BP 4.00, South Africa’s NEMA Principles require environmental justice and special attention to vulnerable parties (Addendum 1). In addition, OP 1.00 on Poverty Reduction provides, *inter alia*, as follows:

*“The Bank’s mission is sustainable poverty reduction. Poverty encompasses lack of opportunities (including capabilities), lack of voice and representation and vulnerability to shocks. The Bank’s support for poverty reduction is focused on actions, consistent with its mandate, to increase opportunity, enhance empowerment, and strengthen security. Within this broad framework, a critical priority is promoting broad based growth, given its proven importance in reducing poverty.”*

512. To the same ends, OP 10.04 indicates that a proper economic analysis must examine a project’s consistency with the Bank’s poverty reduction strategy. Table A1 of OP 4.00 further states the operational principle that the environmental assessment process should include an assessment of socioeconomic impacts, and that measures to prevent or minimize impacts should be accompanied by action to “(...) enhance positive impacts through environmental management and planning that includes the proposed mitigation measures, monitoring, institutional capacity development and training measures (...).”
513. Thus, in the Panel’s view, the Requesters’ claim raises two different issues that need to be distinguished. The first is whether the Medupi Power Plant is likely to have long-term adverse economic impacts on commercial agriculture and nature-based tourism. The second is whether such impacts would negatively affect efforts to reduce poverty in the Lephalale Municipality (i.e. to improve the livelihoods of what is often referred to as the indigent population in the area). These two issues are discussed in turn below. In its assessment of the Claim, the Panel considers Lephalale Municipality as the impact area of the Medupi plant.

### **a. Commercial Farming and Ecotourism**

514. Industrial development in Lephalale Municipality is very recent and the area is undergoing rapid transformation. The local economy was entirely dominated by large commercial farms until coal mining started 30 years ago, and agriculture still contributes some 30% of output. Agricultural production statistics for 2005 indicate that game farming was the largest revenue generator, followed by cattle farming and citrus production. After the official opening of the Grootevlei Coal Mine in 1981, Eskom

built an air-cooled power station (Matimba) close to the coal mine. The Matimba Plant was officially opened in 1989. While the scale of industrial development in Lephalale over the next decade is uncertain, the cumulative socioeconomic and cultural impacts will no doubt become substantive.

515. Municipal planning documents state that the importance of tourism to the local economy is likely to continue growing. *“One of the municipality’s main assets is its large areas that are relatively well preserved, particularly the Waterberg mountain ranges. The magnificence and beauty of these mountains, together with their wilderness atmosphere and rich habitat diversity, provide unmatched opportunities for tourism development”* (Lephalale Municipality, 2006:p.97). This potential is related to the hunting and ecotourism industries, but is also linked to any expansion of industrial operations and related business tourism (Lephalale IDP, 2007/2008, p.50).
516. In recent years a large number of farms have been converted from livestock farming to game farming and today there are some 510 game farms within Lephalale municipality. Tourism has been growing rapidly, primarily related to hunting and ecotourism on these farms, and local stakeholders are concerned about the cumulative effects of coal-based industrialization. In a meeting with the Panel, the Confederation of Hunters’ Association of South Africa highlighted three types of impacts that would, in their minds, affect the area’s tourism potential: on landscape quality, aesthetic value, and the sense of place. These are all factors representing fundamental resources for game farming.
517. Most local commercial farmers, and especially those who have invested in game farming, do not support the Government’s decision to promote further industrial expansion based on the Waterberg coalfields. The Panel heard from Requesters and other residents during its field visits that local game farms had experienced a reduction in visitors and that several ecotourism-based farms had closed down. A delegation of the Confederation of Hunters’ Association of South Africa, Bushveld Hunters’ and Conservation Association, and Endangered Wildlife Trust informed the Panel that 50% of the hunting in South Africa happens in Limpopo Province and expressed concerns about the negative impact that electric power lines have on wildlife and their habitat, and also the changes that the bushveld landscape will have to undergo due to Medupi and its associated facilities. Representatives of the Agricultural Union of South Africa (North) informed the Panel about the negative socioeconomic impact that they believe Medupi will have on the Lephalale area by changing the quality of the local landscape, sense of place, and aesthetic value which they believed to be a fundamental resource for game farming.
518. The Panel is not aware of any recent empirical studies of the economic effects of the existing and proposed power plants in the area on commercial agriculture and game farming. On the one hand, there is a probability that commercial agriculture, game farms, and ecotourism in Lephalale municipality, as stated in the EIR, may stand to benefit economically from an expanded local market due to urban growth, growth in business tourism, and improvements in transport to the area. This would depend on successful efforts to minimize air pollution, as discussed above, and future assurance to farmers of access to a reliable supply of good quality water.
519. It is worth noting that the current game-farming and ecotourism industry developed *after* the establishment of Grooteeluk Coal Mine and the Matimba Power Plant. Although



ecotourism in the literature is often depicted as an alternative to industrial exploitation of natural resources, there is also ample evidence from other countries, such as Costa Rica, that ecotourism destinations can thrive in close proximity to urban centers provided proper environmental control measures are in place (Inman and others, 1996).

520. The cumulative effects of likely industrial investments over the next decades will likely change the area's sense of place, and factors representing fundamental resources for game farming will be impacted by industrial development in Lephale.



Picture 9: A View of the Waterberg Biosphere Reserve

521. The EIR for Medupi states that the proposed power station development will not adversely affect the existing overall tourism industry in the area but it does not specifically evaluate the possible impact of emissions from Medupi on tourism. In contrast, the EIR states that Medupi could potentially increase tourism numbers to the area (albeit in the form of business tourism) as well as broadening the profile of the area as a unique ecotourism destination. The Waterberg Biosphere Reserve, recognized by UNESCO since 2001 and a high-value tourist destination, is at its closest some 40 km south of the Medupi site. The Medupi EIR states that the Reserve is unlikely to be significantly affected by emissions from Medupi, because prevailing winds are from the northeast.
522. **The Panel finds that the EIR's assessment of possible impacts on tourism is not comprehensive and certain conclusions are not backed by empirical analysis. In this sense, the Panel finds that Management's assessment of these aspects of the EIR is not fully consistent with OP 4.00, Table A1's requirement that the country system should call for "appropriate studies [to be] undertaken proportional to potential risks and to direct, and as relevant, indirect, cumulative, and associated impacts."** On the other hand, the Panel notes that though the Medupi investment will contribute to further urbanization and a change of the sense of place, the net effect of this factor on ecotourism and commercial agriculture is difficult to predict.

## **b. Local Poverty Reduction**

523. The Panel notes that the PAD does not identify local development impacts as part of EISP's development objectives and key indicators. Key project outcomes are all on a national scale: increased reliable power, increased renewable energy supply, and reduction in carbon intensity. This notwithstanding, the Medupi plant is a core element of GoSA's plan for making the Lephalale Municipality of the Waterberg District a nationally strategic area for future industrial development. Municipal planning documents argue that the challenge for the future is to stimulate greater economic diversification and more inclusive growth, and that this requires investments in agriculture, tourism, and mining (Lephalale Municipality, 2007/2008, p. 46).
524. As detailed in Chapter 2 above, as many as 98 percent of residents in the municipality, with its highly divided society, can be considered as living in poverty. Public infrastructure is ageing and access to services including education and sanitation is limited. One in three children do not attend school. Data from 2000 to 2005 show that most local jobs are in community services, mining, and agriculture. The local business sector is still small and depends mainly on local purchasing power, which for the majority rural population is very low.
525. The Matimba Power Plant provides a major contribution to the local GDP but with limited local employment generation. The economic effects of the Medupi plant will likely be similar to those of Matimba.
526. Given the tremendous development backlog in the vicinity of the Medupi Power Plant, people have high expectations and demands for employment benefits and improved community services. Local residents question whether the Medupi development will generate pro-poor economic growth in the form of revenue sharing, job creation, and expansion of and improved access to basic services. Representatives of the local community, whom the Panel met during its visits, welcomed the Medupi development but expressed strong sentiments of having been marginalized in the planning process. They expressed strong concerns that local people have not been benefiting from the Project; that the majority of jobs are going to outside laborers; that rural communities see no improvement in social and physical infrastructure (including electricity); and that urban poor communities (e.g. Marapong) may suffer from deteriorating public services due to the influx of laborers.
527. The local population, the Panel was told, by and large welcomed new opportunities for employment and economic growth, but felt that they were not benefitting from the Project as they should. The Panel notes that members of the black and white communities tend to look at the new industrial boom with quite different perspectives. The Panel was informed that white commercial farmers were not only worried about economic and environmental effects per se but more generally about the dramatic changes in the area's sense of place.
528. Representatives of traditional leaders (i.e. the Seleka, Shongoane, and Mokurunyane traditional councils), in meetings with the Panel, also raised the sensitive and emotional issue of land claims. The land where Medupi is being built historically belonged to the Seleka tribe. *"Now we are just called to bless the project and provide cheap labor for*

*the project.*”<sup>270</sup> They claimed that promises made by Eskom had not been fulfilled, and that very few people from the local communities had been employed directly by Eskom. According to the same informants, contractors working for Eskom have recruited about 40% of their laborers from local communities. They claimed that many of these people have been registered as local employees, but are in fact immigrants from neighboring countries. The Panel was unable independently to verify these and similar claims about lack of benefits to nearby communities, but noted the high level of disillusionment expressed.

529. On the other hand, both Eskom and Bank Management informed the Panel about a wide range of development benefits to local communities, including resources for the upgrading of sewerage systems in Lephalale town, improved electricity reticulation, and housing construction. Eskom has supplied medical equipment to village clinics, and paid for investments in crèches and primary schools. The Panel was informed that Eskom had introduced several measures to promote recruitment of laborers from the municipality and that 35-40% of workers (October 2010) are from within a 70 km radius of Medupi.<sup>271</sup> Eskom, as well as its main subcontractors (Hitachi, Siemens, and Alstom), have invested in technical education involving about 2,000 local young people. Eskom also emphasizes local contracting for goods and services, such as feeding contracts.
530. The Panel notes and commends the various efforts to enhance recruitment of people resident in the area, as well as supporting the Municipality of Lephalale in the rehabilitation and upgrading of public infrastructure. The Panel notes, however, that such actions and commitments are not derived from an assessment of impacts and required commensurate mitigatory measures in line with South Africa’s NEMA principles, which include a “polluter pays” approach<sup>272</sup> and require environmental justice and special attention to vulnerable parties (Addendum 1).
531. Looking at the Project from a poverty reduction perspective at the local level, it is likely that Medupi may cause some loss of jobs in agriculture and tourism. This loss would probably be offset by growth in mining and local businesses stimulated by the Medupi development. The Panel notes that Medupi will create direct employment during plant construction, and other jobs will be created due to activities related to the power plant. The direct poverty-reducing effect of the Medupi plant itself, however, would be limited, especially after the construction phase is completed (while 9,000 are employed during the construction phase only 500-600 will be employed during operations), similar to the effects of the Matimba plant on the local economy (Lephalale Municipality, 2007/2008).

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<sup>270</sup> During the field visit some community members complained about the fact that the lands bought by ESKOM in the past belonged to their grandparents. Pertinent legal procedures exist in South Africa under the Restitution of Land Rights Act (Act 22 of 1994). The cut-off date for lodgment of restitution claims was 31 December, 1998. The Panel has no information on whether any attempts have been made to file claims on land to be used for the Project.

<sup>271</sup> The Issues Trail of the Medupi EIR states that “Eskom will include a requirement in contracts with their contractors that a strategy is developed and implemented to employ as far as possible people from the local community.” (Issues Trail, p. 2). See also paragraph 257 of the PAD (measures of Corporate Social Responsibility).

<sup>272</sup> i.e. that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling, or minimizing further pollution, environmental damage, or adverse health effects must be paid for by those responsible for harming the environment.

532. The Panel finds that such links between the Medupi Power Plant and issues of poverty in the impact area of the plant are not addressed in the Project's PAD or SDR, and feature only indirectly in the EIR accepted by Management. Social and livelihoods impacts are dealt with in the PAD and SDR primarily in terms of resettlement.
533. **The Panel considers that Management did not adequately consider these issues relating to poverty reduction at the local level in Lephalale in its appraisal of the Project. Failing to do so in a project entailing such large investments and local impacts is not consistent with the spirit of OP 1.00 to “increase opportunity” and “enhance empowerment” and “strengthen security,” in this case for the indigent population of the municipality. This is also not consistent with provisions on poverty reduction of OP 10.00<sup>273</sup>. Properly addressing this issue might have resulted in a more proactive approach to address conditions that affect or benefit the livelihoods of poor and vulnerable communities.<sup>274</sup>**
534. For instance, given that Medupi is an energy project and that benefits relate in part to providing universal access to electricity and switching from other, more polluting fuels to electricity, it would have been expected that a priority measure at the local scale would be to ensure reticulation to the urban and potentially rural communities. This measure would also constitute an important mitigation measure for probable air quality impacts, particularly within the urban centers, with additional mitigation for potential adverse health effects linked to air quality. This measure is not mentioned in the EIR.

## **D. Impacts on Cultural Heritage and Practices**

535. The discussion below presents the Panel's analysis on claims raised in the Request that the Project will have adverse effects on cultural heritage, through the destruction of grave sites and on cultural practices through destruction of areas with plants of cultural and medicinal significance (Claim number 4).

### **1. Requesters' Claims and Management Response**

536. The Requesters claim that cultural practices in the area could be negatively impacted by the “destruction” of grave sites during construction of the Medupi plant and changes in the availability of sources of traditional medicinal plants as a result of the Project. During the Panel's field visits, local community members elaborated upon their concerns about impacts on grave sites of their family members. The Panel also heard from a traditional healer that the Project was leading to the loss of areas where medicinal plants grow and restricted access to other existing areas.

<sup>273</sup> As stated above, OP 10.00 provides that Bank-financed investment projects are to “help borrowers make the best use of their resources—natural, financial, and human—to alleviate poverty, protect the environment and enhance the effectiveness of their public and private sectors” and that each investment project “must...contribute to poverty reduction and sustainable economic growth.”

<sup>274</sup> In this context the Panel wishes to quote the conclusion of a recent evaluation of the Bank's safeguard policies (*Safeguards and Sustainability Policies in a Changing World – An Independent Evaluation of World Bank Group Experience*, 2010: p. 61). Commenting on the limits of Bank policy, it says: “The Bank's policies and systems emphasize appraisal of environmental and social risks and proposed mitigation plans to ensure compliance with safeguard policy requirements. Strengthening client capacity and enhancing positive impacts tend to take a back seat to mitigating the adverse impacts induced by Bank-financed investments.”

537. Management states in its Response that the conservation of cultural resources is a key issue treated in the Record of Decision (RoD) for the EISP and that it is satisfied South Africa has the necessary regulations and Eskom the institutional capacity to implement the Project while conserving the natural habitat and physical cultural resources in the area (MR: para. 31).
538. Management writes that five graves were discovered during the field survey for the Medupi Power Plant: four in an informal cemetery outside the Power Plant's boundary and one within the boundary. The grave within the site perimeter was exhumed and relocated in November 2007 in accordance with the National Heritage Resources Act (Act 25 of 1999) and the Environment Conservation Act (Act 73 of 1989) which, according to Management (MR: para. 5), is "consistent" with the Bank's Operational Principles outlined in OP 4.00 Table A1.
539. With respect to traditional herbs and medicinal plants, Management states that the plant communities on the Project site were found to be characteristic of the surrounding bushveld, and that clearing of the site would not significantly reduce the availability of plants with medicinal uses associated with cultural practices in the area. Management notes that only a few have been classified as rare, threatened, or endangered species (MR: para. 5).

## **2. Panel Observations, Analysis and Findings**

540. **Grave sites.** In a meeting with local black residents with ties to the Medupi area the Panel received statements from four individuals claiming that graves of their relatives are on the Medupi site and that they had not been properly notified about the location and construction of the plant. The Panel met with one person who confirmed that an exhumation/burial ceremony was held at the behest of the family, for the grave of a child found on the Naauwontkommen farm (now the site of the power plant) which was relocated to a cemetery in Marapong. The Panel has not independently been in the position to validate their claims.
541. The Panel observes that some people claim that graves in the area allocated for the power plant have not been identified and exhumed. The Panel would also like to mention that more grave sites might be discovered after the routes of the transmission lines leading from Medupi are finalized. This issue is further addressed in the compliance analysis below.
542. The Panel notes that the EIR for Medupi identifies the high significance of graves and graveyards and that these sites are protected by South Africa's National Heritage Resources Act No. 25 of 1999 when they are older than 60 years.
543. The National Heritage Resources Act, 1999 defines graves and burial grounds, including ancestral graves, as part of the national estate. The EIR states (p. 381) that "*(T)wo cemeteries were identified. One of these falls just outside the area of proposed development and would therefore not be impacted on directly. The other consists of a single grave,*" and concludes that "*(T)hese features do not present a problem for the proposed development.*" This section of the EIR has been reviewed by the South African Heritage Resources Agency. The Panel visited the cemetery outside the plant area which contained graves of members of a family of early White settlers (allocation of farms to

White settlers started about 60 years ago). The cemetery had been fenced in at the expense of Eskom.

544. The Panel notes that grave sites were identified and addressed in the Medupi EIR as part of the heritage study (section 12). Furthermore, it is the Panel's assessment that Eskom has made good-faith efforts to identify any grave sites that may be affected by the construction. The Bank has been assured that if any oversight has been made, Eskom would respond to any grievances in accordance with the provisions of the South African National Heritage Resources Act.
545. **Plants of value to local communities for cultural or medicinal purposes.** The Medupi plant site (to occupy about 700 ha on the Naauwontkommen property) and ancillary infrastructure including the ash dump (500-1,000 ha on the Eenzaamheid property) are located in an area of mixed bushveld. The issue raised is primarily one of access and not one of whether the land in question contains rare or threatened species or habitats. The Panel observes that local communities who may depend on this area to gather plants and herbs for cultural or medicinal purposes may be negatively affected either through these plants being destroyed or through being denied access to them.
546. The Panel finds that though an Ecological Impact Assessment was carried out under the EIA, it did not assess potential impacts on the availability of medicinal plants. The EIR mentions that the establishment of construction camps may lead to degradation of surrounding natural areas in part through collection of medicinal plants, suggesting that there are such plants of value in the local area being collected. Neither the level of dependence of local communities on such plants, the level of demand for their use, nor the availability of substitute areas from which plants could be gathered, was assessed.
547. Management's response to this issue focused on the conservation status of plants, and the characteristics of broad vegetation communities being similar to those of the surrounding areas. The Panel notes that the importance of plants for medicinal and traditional cultural purposes often bears no relation to their conservation status.
548. While noting that the EIR does not fully assess the consequences of Medupi for the availability of medicinal plants, it is the Panel's view that the consequences are likely not to be serious given the distance of the Medupi site from human settlements and the availability of similar habitats in the area.

## **E. Impacts of Involuntary Resettlement**

549. The discussion below presents the Panel's analysis on claims raised in the Request that the Project will displace people in a manner not consistent with Bank Policy (Claim No. 6).

### **1. Requesters' Claims and Management Response**

550. The Request claims that "*the route for the associated transmission lines for Medupi has not been determined, and there is potential for involuntary resettlement there.*" The Request also states that the Project could cause involuntary resettlement due to the construction of the wind, solar, and rail components. Moreover, the Requesters believe the World Bank has remained "*ambiguous*" about whether South Africa's national

legislation on resettlement is equivalent to World Bank policy, and since the World Bank is applying the Country Systems approach to the Project, they feel this issue of equivalence should be examined in the interest of the potentially displaced persons.

551. Management states in its Response that there is no evidence that involuntary resettlement will take place as a result of the wind and solar component of the Project, and that acquisition of the right-of-way for the Majuba Rail Spur was completed in 2008 and involved rights-of-way and outright purchases (MR: p. 29 §11). Management notes that 13 families of farm laborers are expected to be impacted by noise and that agreements have been reached with the landowners to resettle most of these families further away from the railway. Eskom is overseeing this process (EISP First Supervision BTOR, October/November 2010, pp. 3-4). Management states that the land for the Medupi site was purchased and involved no involuntary resettlement. The Response makes no specific reference to the *“approximately 2,244 km of 400 kV/765 kV transmission lines, and five associated substations”* that are a component of the Project, according to the Loan Agreement (LA: Schedule 1, Project Description, Part A ( 1 b)).
552. Management states, however, that South African legal requirements for resettlement and compensation are broadly consistent with Bank policy, and that Eskom’s procedures and practices compensate appropriately for the differences found. Management adds that the SDR identified two gaps in the South African regulatory framework. One gap related to the monitoring of resettlement actions and reporting on progress until project completion. This was found not to be a gap in Eskom’s practice because Eskom does this type of monitoring regularly. The second gap was filled when Eskom disclosed the Project’s Resettlement Policy Framework (MR: para. 29).

## 2. Panel Observations, Analysis and Findings

553. Although the Requesters voice broad concerns about the Bank’s equivalence evaluation of South Africa’s resettlement legislation, none of the Requesters claims that the implementation of the Project may be detrimental to their right or interests on this matter. Management claims that there is no evidence that involuntary resettlement will take place as a result of the wind and solar component of the Project and acquisition of the Right-of-Way for the Majuba Rail Spur was completed in 2008 and involved rights-of-way and outright purchases (MR, §11, p.29).
554. Management informs that thirteen families of farm laborers are expected to be impacted by noise and agreements have been reached with the landowners to resettle most of the families further away from the railway. Eskom is overseeing this process (EISP First Supervision BTOR, October/November 2010, pp. 3-4), and the Panel has not been informed about any instances of deterioration of livelihoods due to involuntary resettlement.
555. **The Panel observes that the Requesters did not raise any specific instances of policy violation and related harm with respect to involuntary resettlement.** This pertains to the following Project components: the Medupi plant, the solar and wind facilities and the Majuba Rail Spur. **This Report does not include any assessment of resettlement activities related to the transmission lines and associated substations to be built under the Project.** In this context, it is important to note that the Panel has

been informed that Eskom has developed a draft integrated land acquisition and compensation policy, which is being reviewed by Bank experts (Aide Memoire, September 1, 2011, para. 43).

## **F. Impacts on Energy Access by the Poor**

556. The discussion below presents the Panel's analysis on claims raised in the Request that the Project will not provide energy access to the poor (Claim No. 7).

### **1. Requesters' Claims and Management Response**

557. The Requesters claim that the Bank provides no evidence for its argument that the Project will enable Eskom to provide electricity to the 20% of South African population that presently has no access to electricity. The Requesters believe that the Project will mainly benefit large industries.
558. The Panel perceives that the Requesters' claim translates into two different questions. First, will the increased supply of electricity to the national grid from Medupi improve the access to electricity by South Africa's low-income households? Access to electricity is a matter of price and affordability to households, and of expansion of the system of power supply, including off-grid solutions, and actual availability of power, and the question is how Medupi will contribute to any of these factors. Second, will the Medupi investment in any way constrain the ability of GoSA and Eskom to deliver on the commitment to provide electricity to all South Africans?
559. More broadly, the Request reflects a community and civil society-based concern that the Panel wishes to bring to the attention of the Board. The Panel has heard many expressions of concern during its field visits (see Box 4), and from civil society organizations in South Africa, that large scale energy generation projects do not necessarily increase access to electricity at affordable levels to the poor, and in some cases may increase their electricity costs.

#### **Box 4: Views of Soweto Residents about Access to Electricity**

During its field visits, the Inspection Panel met with representatives of NGOs that work and live in Soweto, a township in Johannesburg. These residents, all of them women, spoke at length about their household energy needs and challenges. Below is a small sampling of what they said:

I have experienced blackouts first hand, and I don't think Medupi will make a difference to me in terms of being able to access affordable electricity. The Eskom loan has been requested of the World Bank in my name and in the name of the people of South Africa, but we will not benefit. I wonder if there could be other options that would bring more benefits and have less impact on the future as I am a young person and would have to live with the impacts of the project.

I am hugely affected by electricity tariff increases. In addition to electricity, I have to buy water which is so expensive that I don't flush the toilet all day in order to save costs.

I don't think the FBE in reality is free as I have to buy a voucher and pay to install a meter first in order to receive the free electricity.

*Source: IPN Meetings with NGO Representatives from Soweto, May 2011.*



560. Management states that South Africa and Eskom have increased overall access to electricity from 34% to 81% since 1994 and though the Project does not finance new connections, the Government has made provision for connecting the remaining 19% of households, the majority of whom are poor, by 2014.
561. Management, in its response, emphasizes that the Government's Free Basic Electricity (FBE) policy provides 50 kWh per month to poor households free of charge, and that presently about 25 percent of households benefit from this policy (MR: para. 16). Management states that the poor are also sheltered from the full impact of tariff increases in general by the lifeline tariff, which is based on cross-subsidies, for consumers using less than 350 kWh/month of electricity (MR: p. iv).
562. Management states that the Bank plays no role in tariff setting, which is done by the independent National Energy Regulator of South Africa (NERSA). The Bank has reviewed the tariff structure and "*believes that the announced tariff minimizes the impact on the poor*" (MR: Annex 1, § 18). Moreover, Management does not believe that poor and residential consumers will pay a disproportionate share of the costs for building this Project and also points out that many of South Africa's special pricing agreements will be renegotiated as publicly announced by the GoSA (MR: Annex 1, § 19).

## 2. Panel Observations on Harms Alleged in the Request

563. Between 2005 and 2007, approximately 309,000 households were electrified (NERSA, 2006). 75% of households were already electrified in 2006. For those receiving the 50 kWh per month of free basic electricity, this translates into no restriction on the draw-down of current. Given the numbers of households involved, this policy will lead to a serious and growing peak-load increment. While there are no assurances that most presently unelectrified households will receive electric current in the next three years (as proposed by the Government), a considerable effort is being made.
564. The price that households pay for electricity depends partly on whether or not the supply is provided directly by Eskom or retailed by municipalities, but in both cases the essential price is controlled by NERSA. In response to the generating shortfall and the need to install new capacity, NERSA has recently allowed price rises well above the current inflation rate (see Table 2 below).

**Table 2: NERSA allowed revenue and electricity tariff increases: 2010/11 to 2012/13**

	Average standard electricity tariff	Allowed revenue (billions)	Price increase (percent)
2010/11	41.57 c/kWh	R 85	0.248
2011/12	52.30 c/kWh	R 109	0.258
2012/13	65.85 c/kWh	R 141	0.259

Source: National Energy Regulatory of South Africa, Media Statement, 24 February 2010.

565. The Panel's expert is of the view that these increases are not directly related to the financial impact of the Bank loan for this Project, and would be no less if Eskom were to

use a cleaner generating technology. Moreover, when viewed in real terms over a longer period of time, the price of electricity has been allowed to fall to historically low levels. Even at its full (unsubsidized) price, electricity is still cheaper than retail coal as a source of household energy (measured in useable kilojoules).

566. The stated objective of the EISP, namely to enhance the national power supply in an efficient and sustainable manner, so as to support economic growth and the GoSA's long-term carbon mitigation strategy, supports the GoSA's goals for poverty alleviation and broad-based economic growth. Employment creation as well as further expansion of electricity supply to disadvantaged communities depends on enhancing the energy generating capacity of Eskom (see PAD: para. 2). **The Panel notes that the Project does not have as a direct objective the increase of electricity access by the poor.**
567. A critical issue is Eskom's ability to fulfill national policies of free basic electricity and supply roll-out to un-electrified households. These policies add significantly to both capital and running costs, not only because the process of stepping down and reticulating current in urban areas is expensive, but also because households tend to demand their power during narrow peak periods. Meeting the uneven demand pattern means that facilities with high capital costs (such as pump-storage facilities) or high operating costs (such as gas turbine generators) are needed to cope with peak loads. Thus, though low-income households use relatively little power overall, they have a disproportionate and growing impact on peak-load demand.
568. According to the Panel's expert, the fact that supplying electricity to meet household demand is considerably more expensive than supplying it to meet industrial demand (NERSA, 2006) is reflected in relative prices. Importantly, while industrial power is typically roughly half the price of household power, it is industrial users who are cross-subsidizing households, and in particular low-income households.
569. The key feature of electricity in South Africa is that it is not typically generated locally for local consumers, but is generated at locations all around the country and put into a grid which serves the entire nation. On the question of whether the Project will increase access to electricity for impoverished communities, the Panel's expert states that this will mainly depend on the rate at which the poor take up the free and subsidized electricity being made available and Eskom's rate of progress on the electricity roll out to the poor. The Panel notes that this Project is unlikely to diminish electricity access to the poor, and may enhance access by adding more electricity to the national grid. **The Panel did not find an issue of compliance with Bank policy with respect to this claim.**

## **G. Impacts on the National Economy**

570. The discussion below presents the Panel's analysis on claims raised in the Request that the Bank Loan will have negative impact on the national economy (Claim No. 8).

### **1. Requesters' Claims and Management Response**

571. The Requesters claim that repayment of the World Bank loan will "*require more exports and higher tariffs*" to compensate for any future currency devaluation. The requesters

note that South Africa regularly experiences currency crashes, the most recent of which have caused more than 15% devaluation.

572. Management believes the loan will not put undue stress on the country's foreign exchange situation because the payment on the principal amount will be no more than 0.1% of the country's total exports in any given year. Management states that according to analysis it undertook in conjunction with the Department of National Treasury, the loan repayment amount is consistent with South Africa's prudent debt policy. Moreover, Management states that the IBRD loan is the cheapest and longest-maturity loan available to Eskom from any financial source, totaling 9% of Eskom's total liability when the Project is commissioned in 2012 (MR: Annex 1, § 20).

## **2. Panel Observations on Harms Alleged in the Request**

573. While there is merit in Management's reasoning, the Panel notes that the EISP loan is not small. Experience with the last round of power-station construction, which was largely financed using externally raised Eskom bonds, was that each round of issues (and redemptions) did have a short-run impact on the exchange rate. The Rand is a comparatively thinly-traded currency and on a daily basis any single large inflow or outflow can affect it. That said, however, a loan of US\$ 3.75 billion phased over the remaining construction period of the Project, to be repaid over 25 years including a 10-year grace period, is unlikely to have any sustained impact on the exchange rate.
574. **The Panel did not find an issue of compliance with Bank policy with respect to this claim.**

## **H. Consideration of Project Alternatives**

575. The discussion below presents the Panel's analysis on claims raised in the Request that the Project did not adequately consider "*alternatives to coal*" (Claim No. 11).

### **1. Requesters' Claims and Management Response**

576. The Request for Inspection claims that the Project did not adequately consider "*alternatives to coal*". The Requesters' claim implies broad harm linked to the choice of coal-fired power generation in preference to a more environmentally friendly alternative with fewer externalities.
577. In its Response, Management states that South Africa has developed a credible low carbon strategy, based on a Long Term Mitigation Scenarios (LTMS) study that considered a range of energy options (MR: para. 9). Management also states that there are no immediate domestic alternatives to coal for ensuring electricity supply in South Africa as it is the major and only low-cost source expected to dominate the energy mix for the next 10-15 years (MR: para. 12). Management states that in terms of alternatives, the greatest potential for large renewable projects lies in concentrating solar power (CSP) and wind power. However, CSP technology is in the early stages of development and cannot be relied on for South Africa's large base-load needs. Comparable state-of-the-art solar power technologies with storage characteristics to mimic base-load supply

from coal are not mature enough, and new hydropower potential hardly exists in South Africa (MR: para. 12).

578. Previous sections of this report have touched upon issues relevant to Bank policy requirements to consider project alternatives.<sup>275</sup> The present discussion focuses more specifically on Claim No. 11 in the Request, relating to “*alternatives to coal*”.
579. The consideration of alternatives is a cornerstone of good EIA practice and, as noted previously, a basic requirement of Bank policy relating to environmental assessment, project appraisal, and economic analysis of investment projects. The policy requirement to consider alternatives is challenging in the present case, given that Eskom had already begun construction of the Medupi Power Plant before the Bank agreed to provide financial assistance. In this context, the Panel notes that Management’s responsibility to ensure that there is a complete and balanced review of design alternatives may be considerably more difficult given that such an analysis had already been carried out by the Borrower and a project alternative already selected for implementation.
580. The question for the Panel, with respect to project alternatives, is whether the analysis of Bank Management supporting its recommendation to the Board of Executive Directors to finance Medupi was consistent and in compliance with the Bank’s operational policies and procedures, and whether exceptions to such policies, if any, were properly documented and disclosed to the Board, and whether any lack of compliance might contribute to harms alleged by the Requesters.
581. As noted previously, the Interim Guidelines for Addressing Legacy Issues<sup>276</sup> call for a review of all aspects of the project in the light of current Bank safeguard policies and procedures. Project records maintained by the Bank show that Regional Management requested, among other things, a rigorous analysis of project alternatives in the context of the preparation of the loan package to be submitted for Board approval.

## **2. Panel Observations, Analysis and Findings**

582. With reference to energy generation alternatives, South Africa’s Long Term Mitigation Scenarios (LTMS) study and Integrated Resource Plan for Electricity (IRP2) highlight that in the short term, few options other than the use of coal are feasible. GoSA has taken a number of steps to shift away from coal and move to a mix of nuclear and renewables. Of South Africa’s installed power generation capacity, coal represents 91.7%; nuclear energy 4.2%, hydro 2.4%, and pumped storage 1.7%<sup>277</sup>. In the long term there are sustainable options that could be promising; according to the IRP2, the intended mix by 2030 will comprise coal 48.2%, nuclear 13.4%, hydro 6.5%, wind 13.8%, concentrating solar power (CSP) 0.7%, and other 1%.<sup>278</sup>

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<sup>275</sup> Chapter 5 Sections C and D on air and water issues consider technology options to reduce Project impacts; Chapter 5 F on climate change considers the Project analysis of alternatives in light of the externality of greenhouse gas emissions; and Chapter 5 B, above, considers the Project’s economic analysis of alternatives.

<sup>276</sup> Interim Guidelines for Addressing Legacy Issues in World Bank Projects, June 2009.

<sup>277</sup> Department of Energy, South Africa Energy Synopsis, 2010.

<sup>278</sup> Table 2 page 9 of IRP2: Integrated Resource Plan For Electricity 2010-2030, Revision 2, Final Report 25 March 2011.

583. However, the Panel notes that, according to Bank policy, the design and appraisal of a project must also be seen in relation both to defined timeframes and to robust economic analysis that takes into account domestic and cross-border externalities; including in this case impacts on water resources, and air quality. That is, to inform the best practicable environmental option, it would have been appropriate to evaluate a range of alternative scales of coal-fired plants developed in parallel with longer-term and more environmentally friendly options, ensuring that the evaluation took into account the full range of potential externalities across the life of the proposed plant. The Panel notes that the purpose of the IRP is to provide an overarching framework for electricity sector development in South Africa (PAD, para.44).
584. The need to provide base-load electricity to meet demand within certain timeframes if South Africa's developmental goals are to be met is explained in some detail in the PAD. The Panel finds merit in Management's analysis of the importance of this objective, and the various constraints (such as longer construction times or higher costs) that were relevant to the choice of a coal-fired power generation alternative in the short term.
585. The Panel notes, however, that different sizes of generating units for Medupi were evaluated from the perspective only of economies of scale and proven performance. No evaluation of unit size was carried out on broader grounds (e.g. for SO<sub>2</sub> emission abatement technology, and associated water use purposes), and alternative capacities of the proposed power station as a whole were not considered in the EIA from perspectives of expediting a shift to—and investment in—relatively less harmful power generation options.
586. The Panel notes that the EIA scoping “*only considered alternatives considered in terms of the proposed new coal-fired power station in the Lephalale area.*” The rationale for this approach is that other, more “fundamental” alternatives for electricity are addressed in other GoSA and Eskom-sponsored studies (Medupi EIR, p. 9).
587. The Panel notes that it is consistent with EIA practice to draw upon existing relevant studies and documentation. The Medupi EIA accepted by the Bank, however, does not provide an adequate assessment -- or even summary -- of the basis upon which one large coal-fired power plant (such as Medupi) was selected over other possible scale or phasing options. It does not provide clarity on the merits and risks of these other alternatives, including with respect to negative externalities relating to air, water, and cumulative impacts.
588. The Panel recognizes that Bank Management became engaged in the Project after a decision on the scale of Medupi had been made, and after construction had begun. In addition, upon becoming engaged, Bank Management took an important step to develop additional analysis on the potential GHG externalities of the Project, and a key added value of intervention by the World Bank was to provide financing in support of two renewable energy projects and other energy efficiency components.
589. **The Panel commends the initiatives by Management to carry out an additional GHG analysis, provide support for the renewable energy and other energy efficiency components, but finds that Management did not ensure that Project documentation adequately considered feasible alternatives, as required by Bank policy, to promote informed decision-making by the Board.**

## Chapter 6: Systemic Issues and Contributions to Corporate Learning

590. Like other previous Panel investigations, this investigation of the South Africa – Eskom Investment Support Project has revealed systemic issues relevant to the Bank's compliance with its operational policies and procedures. As part of its efforts to promote corporate learning resulting from Inspection Panel investigations, in this Chapter the Panel discusses three such issues: policy compliance in projects prepared under the Bank's policy on Borrower/Country systems; policy compliance in relation to activities associated with a Bank-financed project; and assessing the impacts on water resources of projects in non-water sectors.

### A. The Borrower/Country Systems Policy

591. The Policy on Use of Borrower/Country Systems is still at a pilot stage, and this investigation, therefore, provides an important opportunity for corporate learning, especially since this is the first Panel investigation of a project carried out under this Policy.
592. The Panel notes in this regard that it was involved in discussions with the Board when the pilot project on use of country systems was launched. In 2004, the then Chair of the Inspection Panel, in a statement on the Use of Country Systems<sup>279</sup>, discussed the role of the Panel to provide the Board with an independent assessment of whether the objectives of the World Bank safeguard policies and procedures have been materially met. In this statement, the Chairperson observed that *"if there is a complaint before the Panel, this independent assessment could be an important contribution to the objectives of the pilot projects and, ultimately, to the development of objective standards and practices for the Use of Country Systems Initiative."* In view of the growing number of projects that will be carried out under this policy, the Panel hopes that our investigation and our comments below may contribute to the objectives of the pilot project as well as corporate learning more generally with respect to this important approach.
593. First, the Panel's investigation highlights the importance not only of focusing on the borrower and country systems, but also on appraisal and supervision at project level in accordance with OP/BP 4.00 and other operational policies of the Bank. Our findings suggest that while a borrower/country system may meet the equivalence and acceptability criteria, the specifics of the particular project may fall short of meeting the requirements of that system, presenting a risk to the Bank of non-compliance with its policies. In the Medupi case, Management paid insufficient attention to certain features of the project context in evaluating the EIA. In the Panel's view, one factor contributing to this was the decision to use the Project EIA and its process as an input to the Safeguards Diagnostic Review (SDR) and, hence, as supporting evidence of "equivalence" and "acceptability" of the borrower/country systems.
594. Second, the Panel's investigation points to the importance of being specific about the timeline when evaluating the equivalence of borrower/country systems with those of the Bank. Management must identify any discrepancies between the systems in place at the

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<sup>279</sup> Executive Directors Informal Meeting May 20, 2004, INSP/SecM2004-004

time the project's environmental impact assessment is carried out and the systems in place when the Bank is approached for financial assistance and the SDR is carried out. In the case of this Project, the equivalence analysis in the SDR did not adequately make this distinction and gaps that were in the system at the time of the Medupi EIA were not properly addressed.

## **B. Policy Compliance in Relation to Associated Impacts, Facilities, and/or Activities**

595. In the course of its investigation, the Panel encountered a number of facilities and activities that are clearly linked to the Medupi Power Plant and/ or on which the plant depends. The Country system may, however, dictate that they are assessed in separate EIA processes. These facilities and activities raised issues about either the significance of impacts associated with the particular facility/activity alone, and/or their cumulative impacts in addition to impacts of the plant as financed under the Project. Moreover, these issues highlighted questions about compliance with Bank policies in the preparation and appraisal of the Project.
596. The Panel's investigation suggests that new activities/facilities are developed specifically to meet the needs of the Project, and that these should be regarded as "associated" with the Project, regardless of the source of financing. This includes, as described in Chapter 4, the additional scale of MCWAP, the expansion of the operations of the Grootegeluk Mine, and the additional river bed sand-mining along the Mokolo River by sub-contractors for Medupi construction. The potentially significant environmental and social impacts of these activities/facilities should have been assessed and included in the scope of the Bank's appraisal. Furthermore, the investigation suggests that the close proximity to the Project of these activities/facilities, giving a greater potential for significant cumulative impacts on the receiving area, strengthens the need to treat these as "associated" with the Project.
597. The Panel acknowledges that achieving policy compliance in the context of "associated impacts" (and associated activities and facilities giving rise to these impacts) is not straightforward. The Panel's investigation raises questions about the Bank's understanding of what constitutes an "associated impact", "associated facility", and/or "associated activity". The Bank does not seem to have a clear definition of these terms.<sup>280</sup> Yet, it is of the utmost importance when undertaking an EIA to define the area of influence and potentially significant impact of the project. For this reason, clarity on the inclusion or exclusion of activities or facilities that could qualify as "associated" is needed. Only by achieving this clarity will the Bank be in a position to exercise sound judgment on the need for, and scope of, studies proportional to potential risks and impacts.
598. It is pertinent to note that the consideration of "associated impacts" may necessitate an extension of the scope of the Bank's analysis of the country's regulatory system.

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<sup>280</sup> See discussion in Chapter 4 on "associated facilities".

### C. Assessing Impacts on Water Resources

599. As discussed in Chapter 4, this investigation has raised concerns about the way in which Bank Management analyzed the impact of the Project on water resources. In doing so, it has highlighted the fact that projects in sectors other than water, such as energy, can have a significant impact on water regimes.
600. Indeed, several requests recently received by the Panel have raised concerns that Bank-financed projects in non-water sectors may affect local water regimes in ways that negatively impact peoples' lives and livelihoods. The Panel's investigation of a Request for Inspection related to the Argentina: Santa Fe Road Infrastructure Project in 2009, for example, focussed on potentially increased flood risks to those living nearby. Likewise, the Panel's recent investigation of the Smallholder Agriculture Development Project in Papua New Guinea included an examination of local concerns that oil palm development in the area would lead to chemical and biological pollution of local streams<sup>281</sup>.
601. In the EISP case, the Panel's investigation centered around the concern of local residents that the power plant will require more water than is available in this water-scarce area, which would in turn impact on water currently being withdrawn by other users for agriculture and other purposes. The Panel's investigation revealed that, in its consideration of water issues, Management focused principally on ensuring that the Medupi Power Plant had a reliable source of water supply, and gave insufficient attention to the potential impacts that the plant would have on the amount and quality of water available to other users.
602. The Panel's investigation of the Argentina Request, noted above, revealed a similar situation. This Project involved upgrading a road going through a very flat area that was constantly being flooded. The upgrade entailed adding two lanes and elevating them slightly so that traffic could flow even if there were heavy rains. However, local farmers were concerned that the elevated roads would act like a small dam, flooding their fields during heavy rains. The social and environmental assessment in this case concluded that the structural measures planned to ensure that the road did not flood would in themselves guarantee that the impact of the project on local flooding would be minimal, but did not however provide specific information on the project's additional flood impacts. All in all, Management seemed to focus principally on ensuring that the road did not get flooded, rather than on the impacts of the project on the additional flood risks faced by local residents.
603. In both these cases, the Panel's investigations revealed that Management's focus was on the engineering design issue of ensuring that the project was "water secure" (i.e., that it had a reliable source of water supply or was adequately protected against floods), rather than on the environmental impact issue of assessing the Project's impacts on local water regimes. In other words, Management seemed to focus on examining the water related risks to the Project, with less attention to the risks to project affected people.
604. Importantly, this issue is likely to become even more relevant in future with increasing water variability and concerns about water security. This suggests the need for the

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<sup>281</sup> In addition, the Inspection Panel has received numerous Requests related to Bank-financed projects in the water sector. Indeed, the last five Requests for Inspection received by the Panel have focused on such projects.



Bank's highly qualified water resource professionals to give specialized attention to projects in transport, energy, agriculture and other "non-water" sectors that have the potential to have negative impacts on water resources.

## Annex A – The Medupi EIA Process

By Susan Brownlie, Panel Expert on Environmental Impact Assessment

The text of this Report reviews Bank Management's assessment of safeguard documents prepared for the Project, including the Medupi EIA. This annex provides additional background information on the process of development of the Medupi EIA as accepted by Management, as a way to assist in the understanding of some of the analysis of Project safeguard documents in the main text.

In South Africa, this early process is fundamental to ensuring quality in the EIA. It is crucial that the scope of EIA be well defined, alternatives be investigated to an appropriate level of detail using robust criteria, and potential impacts be explicitly and reliably assessed and evaluated. Also, it is important that the interdependencies between these key harm areas be recognized in the assessment and identification of clearly defined, measurable (auditable) mitigation and compensation measures.

### 1. EIA process: stakeholder engagement, scoping and sequencing

1. **Stakeholder Engagement.** The Issues Trail comprehensively reflects the concerns voiced by many people during the EIA process. However, concerns of the Requesters and of some people interviewed during the investigation visit point to some potential shortcomings in the consultation process:
  - The focus of public participation seems to have been on government entities, agencies, and departments and on affected landowners (EIR: Section 3.4.3). Comments in the Issues Trail seem to reflect this.
  - Although Farmers Associations are noted as being engaged, members of the Farmers Association with whom the investigation team met in Lephalale felt that engagement had been insufficient and poor. Other key stakeholder groups (e.g. traditional leaders, ratepayers' associations and hunters' associations) also indicated that they were unaware of an EIA process, suggesting flaws in the effectiveness of the stakeholder engagement process.
  - Notice of meetings was made by fax or email to which members of rural communities are unlikely to have access.
2. **Scoping.** OP 4.00 requires that a "screening" process be used to determine as early as possible the extent and type of impact assessment that is needed, so that appropriate studies can be undertaken proportional to potential risks and impacts. In South Africa, where the need for an EIA is triggered by listed activities in terms of the EIA regulations, "scoping" (synonymous with "screening") plays a key role defining the spatial and temporal scales of the EIA, in identifying alternatives and potentially significant impacts determining the need for specialist studies, and in defining the associated scope of EIA studies and in defining the range of issues and impacts to be covered in these studies.
3. For the Medupi Power Plant investment, the scope of the EIA described in the Plan of Study (PoS) for EIA and the Terms of Reference for specialist studies is largely generic

and fails to give clear direction. The scope of the Medupi EIA is defined by those “listed activities” in the ECA EIA regulations that are triggered by the power plant project. This EIA does not address all the impacts and risks within the Project’s area of influence, because the authorization of a number of associated activities (e.g. transmission lines) is pursued through separate EIAs and/or undertaken for different competent authorities. The Medupi EIR includes consideration of selected infrastructure and activities (e.g. the ash dump, the conveyer belt for coal supply) but excludes others (e.g. sewage treatment facilities, housing for construction workers).

4. Though the SDR notes that a plan of study (PoS) for EIA was required for Medupi’s EIA, it does not evaluate the adequacy of the PoS. The PoS is a legally required and important document in the EIA process. In terms of the EIA Regulations (Regulation (7(1)(b), R1183 of 5 September 1997), the PoS for an EIA must set out the issues that require additional investigation, the feasible alternatives to be investigated, and the methods to be used to assess key issues and impacts. Once the PoS for an EIA has been accepted by the competent authority it becomes legally binding.
5. Explicit terms of reference are essential to good practice EIA in South Africa (DEAT, 2002b; Münster, 2005), to ensure that the EIA is transparent, systematic, and focused on the areas of major risk or impact. OP 4.00 Table A1 (Operational Principles for Environmental Assessment) echoes this point. It states the requirement to use a screening process so that appropriate studies are undertaken proportional to potential risks and to direct, and, as relevant, indirect, cumulative, and associated impacts.
6. For the Medupi Power Plant, the Plan of Study for EIA<sup>282</sup> lists ten specialist studies to be undertaken as part of the EIA phase. Although the PoS states that “*all potentially significant impacts...will be investigated and assessed through specialist studies,*” it gives only a broad indication of the scope of the specialist studies, and little if any explicit treatment of specific issues of concern within each of the specialist areas that were raised by stakeholders during scoping and captured in the Issues Trail.
7. The scope of several specialist studies described in the PoS is inadequate or confusing. For example:
  - Water resources are only to be covered at the “preferred site/s” level, with the focus on possible pollution of groundwater. Issues related to water flow, impacts on surface water quality, and downstream impacts on water users and the freshwater ecosystem are deferred to the EIAs for the MCWAP. No mention is made of opportunity costs and implications for aquatic ecosystems and other water users of the Medupi plant (including livelihoods, health, and financial implications).
  - In addition, several sources of risk are not mentioned. These include the risk associated with assuring an adequate supply to the power plant; the potential impacts on surface water quality associated with the Medupi plant (including the proposed use of return flow from Lephalale’s wastewater treatment plant and of disposal of FGD waste); and the potential impacts on water resources of augmenting water supplies to Medupi using groundwater, should the commissioning of the MCWAP Phase 2 be delayed. Medupi’s application for environmental authorization in terms

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<sup>282</sup> “Plan of Study for EIA for the proposed establishment of a new coal-fired power station in the Lephalale area, Limpopo Province, 5 December 2005.” Bohlweki Environmental (Pty) Ltd. Hereinafter, referred to as “PoS.”

of the ECA EIA regulations includes sewage treatment works<sup>283</sup>, and the EIR (para. 15.5.4) notes that “*the Council’s water treatment plant will have to be enlarged and several new pump stations installed.*” But neither of these works, nor other works such as stormwater/wastewater retention dams or waste disposal arrangements, is included in the scope of the EIA, despite stakeholders having raised concerns about water, sewage, and waste treatment/management facilities.<sup>284</sup> Water quality issues are addressed through a broad risk assessment and the identification of a suite of possible mitigation measures that could be considered, rather than through firm recommendations for mitigation targeting case- and context-specific impacts.

- Air quality studies through modeling are to look at the potential for non-compliance and to give a “preliminary assessment” of health risks; the PoS does not make clear at what point a full assessment of health risks would be undertaken.
  - The plan for a social impact study refers to gathering “*data on the labor requirements of a mine to supply the proposed power station with fuel*” (PoS: p. 15). That is, the boundaries of that study appear to include the Grootegeluk Mine in addition to Medupi.
8. The consideration of alternatives is a requirement of South Africa’s EIA laws and a key operational principle of OP 4.00 (see OP 4.00: Table A1). Despite the explicit requirement for the PoS for the EIA to identify feasible alternatives, no alternatives are specified in the PoS.<sup>285</sup> In accepting the Scoping Report for Medupi, DEAT requested a more detailed description of the process used to determine the choice of Lephalale and the alternatives studied<sup>286</sup>; this request is superficially addressed in the EIR. Furthermore, in accepting the PoS for the EIA, DEAT stipulated that a “*more detailed description of the alternatives studied*” must be included; but it did not specify any particular alternatives.
  9. In summary, the PoS for the Medupi EIA gives little assurance that an appropriate suite of alternatives or of key issues would be addressed, leaving the scope of study to Eskom and the consultant. In addition, its reference to mitigation is insufficient and it takes no cognizance of the NEMA s2 requirement for impacts to be “remedied” rather than simply reduced, or minimized and offset as per OP 4.00.
  10. The Issues Trails in both the Scoping Report and the EIR for Medupi give a confused and at times contradictory picture of the scope of the EIA. Compounding this confusion is the fact that a change in the approach for developing the Medupi Power Plant, from the initial two-phase to a single-phase project, effectively removes from consideration some potential alternatives for mitigating impacts.<sup>287</sup> **Without clarity on the accepted scope of the EIA, the EIR provides little assurance that impacts would be assessed**

<sup>283</sup> This “activity” is deemed to cause “*substantial detrimental effect*,” and is thus listed in a Schedule to the Environment Conservation Act 1989, and triggers the EIA regulations in terms of this Act.

<sup>284</sup> See EIR: Issues Trail ; E.g. wastewater dams p.205; sewage, wastewater p.120.

<sup>285</sup> Location alternatives are addressed in the PoS for Scoping only; the PoS for EIA describes the scope of the EIA in terms of assessing impacts at “*the nominated preferred site*” only [4.2.2. of the PoS for EIA].

<sup>286</sup> DEAT, acceptance of Scoping Report: 21 February 2006.

<sup>287</sup> E.g., “*The second phase (timing, capacity, and technology) will be decided upon in due course through the Eskom approval processes .” “PF combustion technology is the preferred technology for the first phase, and the feasibility of using FBC combustion technology for the second phase of the project is still being considered.*” EIR: p.8.

**and that adequate mitigation and compensation would be identified.** Identification of gaps in the EIA process at the legally required points of engagement with stakeholders and the competent authority could—and should—have ensured an appropriate level of investigation of the key instances of harm and of their mitigation.

11. **Sequence of Steps.** The sequencing of the EIA process raises a number of questions with regard to the adequacy of the assessment, evaluation, and mitigation phase. Concerns that “*the process in terms of recognized EIA practice has not been followed*” and about the timeline for the EIA, were raised by stakeholders in the Medupi process (EIR: Issues Trail).
12. The process followed for Medupi’s EIA does not comply with the sequence of steps set out in South Africa’s EIA Regulations; the scope of studies and alternatives for the Project was effectively set prior to the requisite acceptance of the Scoping Report and/or the Plan of Study for the EIA by the competent authority.<sup>288</sup> An Addendum to the Medupi EIR was submitted to the authority in June 2006 (no reason was given for the preparation of this Addendum), and a Record of Decision was issued in September 2006. Bank Management did not identify these process issues as a potential flaw in the EIA process.

## **2. Legal Instruments and Conditions**

13. In the Medupi case, both the EIA and the RoD contain a number of shortcomings. The RoD and other legal instruments provide the basis for ensuring that Bank policies will be complied with during project implementation and associated supervision. The Requesters’ harm-specific Claims No 1, 2, 5, and the broader Claims 10-13, are relevant in this respect. The RoD stipulates conditions with regard only to air quality and groundwater monitoring; it pays little attention to other areas of potential harm (e.g. harm to water sources or public infrastructure; socioeconomic or livelihoods impacts), partly because these areas were inadequately assessed in the EIA.<sup>289</sup>
14. In addition, although environmental management plans are required for project construction and operation, the scope of these plans is vague: actions are generalized and performance targets (or measurable outcomes and indicators) are absent in many instances. The Construction Phase EMP for the Medupi Project (Bohlweki Environmental, 2007) omits a number of the measures that are specified in the conditions in the RoD. An Environmental Control Officer and an Environmental Management Committee have been appointed; however, their roles are effectively defined - and limited - by the EMP contents. Neither the RoD nor the EMP provides

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<sup>288</sup> The Panel expert notes that the Scoping Report (Bohlweki Environmental, 2005) is dated 11 November 2005 and was accepted by DEAT on 21 February 2006, with a request to submit a plan of study for EIA and to include a number of specific issues in the EIR. The Plan of Study for EIA had already been submitted on 5 December 2005, before acceptance of the Scoping Report, and it allowed for two months (December 2005-January 2006) for the completion of ten specialist studies and the compilation of the EIR. The PoS for EIA was accepted by the competent authority on 09 March 2006, endorsing the approach and scope of the EIA study. A Draft EIR (Bohlweki Environmental, 2006) was released for stakeholder comment two weeks after formal acceptance of the PoS for EIA (23 March 2006), suggesting either undue haste in the undertaking of any specialist studies required and/or near completion of the EIR prior to acceptance of the Plan of Study for EIA. The final EIR (Eskom, 2006) is dated 22 May 2006.

<sup>289</sup> The list of conditions specified in the RoD/authorization relies heavily on recommendations made in the EIR. Where those recommendations are vague, the RoD tends to be similarly vague.

assurance that either the NEMA principles or OP 4.00 will be satisfied, and in the Panel's view there is a material risk of mitigation either not being implemented or not being implementable.

15. The PAD states that as “*part of its overall approach to strategic and cumulative impact assessment, the DEA has also awarded a contract for the development of the Waterberg Environmental Management Framework (EMF), which will examine current conditions and long-term management options for biodiversity conservation, air quality, water supply, agricultural development, ecotourism and industrial and population growth*” (PAD: para 68). The EMF was completed in December, 2010.<sup>290</sup>
16. Contrary to statements made in the PAD and the SDR (Annex 5: Issues 33, 34, 37) that the issue of water supply and allocation “*will be thoroughly addressed*” in the EMF, it is unlikely that - apart from providing broad guidance on water use and quality, and on land use - the EMF would fulfill this expectation. The EMF, while providing a useful synthesis of environmental information, does not provide explicit sustainability criteria, limits of acceptable change or management targets, or indicators against which to evaluate proposed activities, development, or land use change—all features seen to be important for a Strategic Environmental Assessment (SEA) practice in South Africa (e.g. DEAT, 2007). In addition, it provides only limited guidance on certain environmental issues; neither air quality nor water resources management is covered in any detail (EMF: Chapter 7).
17. For more focused and effective management of critical resources such as water and air, EMFs are unlikely to supplant existing tools such as the catchment management plans that are used by catchment management agencies to manage water resources; the social development frameworks used at district and local municipality levels to manage public infrastructure and services; or air quality management plans such as that prepared for the Waterberg District Municipality in mid-2009.<sup>291</sup> The Panel finds no evidence that Management considered such alternative mechanisms to manage these types of cumulative effects.
18. The PAD specifies that the EISP shall be implemented by the Borrower in accordance with (among others) the RoD, the EIA, and the EMP. Deficiencies in these instruments have implications for compliance monitoring and enforcement by the Bank. It is not clear that these deficiencies, for which no specific remedy has been identified by Management, will be addressed since they are not currently incorporated in programs for compliance monitoring and enforcement by the Borrower.

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<sup>290</sup> Adopted by way of a notice in the Government Gazette of 7 October 2011 in terms of the NEMA EMF Regulations, 2010. This means that the EMF must be implemented and monitored, and taken into account by decision makers when considering development applications

<sup>291</sup> A comprehensive emissions inventory and characterization of existing air quality in the Waterberg airshed has yet to be developed.

## Annex B – Biographies

### Panel Members

**Roberto Lenton** (Argentina) was appointed to the Inspection Panel in September 2007 and became its chair in November 2009. He earned a civil engineering degree from the University of Buenos Aires and a Ph.D. from the Massachusetts Institute of Technology (MIT). A specialist in water resources and sustainable development with some 40 years of international experience in the field, he has served as chair of the Water Supply and Sanitation Collaborative Council and of the Technical Committee of the Global Water Partnership. Mr. Lenton is a coauthor of *Applied Water Resources Systems*, a coeditor of *Integrated Water Resources Management in Practice*, and a lead author of *Health, Dignity and Development: What Will it Take?*, the final report of the United Nations Millennium Project Task Force on Water and Sanitation, which he co-chaired. Earlier, Mr. Lenton was director of the Sustainable Energy and Environment Division of the United Nations Development Programme in New York, director general of the International Water Management Institute in Sri Lanka, and program officer in the Rural Poverty and Resources program of the Ford Foundation in New Delhi and New York. He has served as adjunct professor in the School of International and Public Affairs at Columbia University and assistant professor of civil and environmental engineering at MIT.

**Alf Jerve** (Norway) was appointed to the Inspection Panel in November 2008. Mr. Jerve brings to the Panel close to three decades of work in the field of development. A social anthropologist by training, he has been engaged in a wide range of development activities, including extensive field research in Africa and Asia. Among his assignments was a three-year posting to Tanzania with the Norwegian Agency for Development Cooperation as coordinator of a rural development program. From 1993 to 1995, he was responsible for resettlement and rehabilitation issues with projects in Bangladesh during an assignment with the World Bank. In 1995, he became Assistant Director, and served as Director in 2005 and 2006, at the Christian Michelsen Institute in Norway, an internationally recognized development research institution, where he has also devoted his energies and expertise to research and analysis of a wide variety of policy and program issues affecting people in developing countries. Over the years, Mr. Jerve has led and participated in numerous independent evaluations commissioned by bilateral and multilateral development agencies, and served as a member of the Roster of Experts for the Asian Development Bank's Inspection Function. He earned his magister degree in social anthropology from the University of Bergen, and his bachelor's degree is in the areas of environmental science and biology. His publications have focused on rural development, decentralization, and poverty reduction and most recently on issues of ownership in development aid cooperation.

**Eimi Watanabe** (Japan) was appointed to the Inspection Panel in November 2009. Throughout her career, Ms. Watanabe has demonstrated a commitment to applying analytical as well as participatory approaches to development programs, and a strong track record of

working collaboratively with civil society organizations, governments, and other development organizations. A sociologist by training, she has been involved in a wide range of substantive areas, at both the project and policy levels, including poverty reduction, governance, gender, child health and nutrition, capacity development, environment, and international migration. Ms. Watanabe earned a M.Sc. and Ph.D. from the London School of Economics and received a B.A. in sociology from the International Christian University in Tokyo. From 1998 to 2001, she served as assistant secretary general and director of the United Nations Development Programme (UNDP) Bureau for Development Policy. Prior to that, she was UN resident coordinator and UNDP resident representative in Bangladesh, and UNICEF Representative in India. Recently she has served as a member of the Strategic and Audit Advisory Committee of the United Nations Office for Project Services. Ms. Watanabe brings to the Panel more than 30 years of experience in the field of development.

### **Expert Consultants**

**Eduardo Abbott** (Chile) served as Executive Secretary of the Inspection Panel for 12 years, from 1994 to January 2007. Prior to joining the Panel Secretariat, he spent 15 years as a member of the World Bank's Legal Department, where he was Principal Counsel for Operational Policy for four years. In this position, Mr. Abbott contributed in the preparation of new Operational Directives and in the revision of older Policy Statements. Mr. Abbott has also worked in the Latin America and Europe and Central Asia Divisions of the World Bank's Legal Department. After his retirement he has advised the Secretariat of the Inspection Panel on institutional matters. Prior to his career at the World Bank, Mr. Abbott worked at the U.S. Library of Congress as Legal Specialist in foreign law. In his native Chile, he had an active legal practice providing legal advice to a number of trade unions, as well as to industrial and financial institutions. He is also Assistant Professor at the Law School of the University of Chile in Valparaíso and Adjunct Professor of Law at Georgetown Law School. Mr. Abbott pursued his graduate studies at the University of Wisconsin at Madison, where he obtained his Masters of Science Degree in Legal Institutions.

**Susan Frances Brownlie** (South Africa) is an independent environmental consultant based in Cape Town, South Africa. She has almost 30 years of experience in the field of environmental assessment and management in both the public and private sectors, having worked in South and Southern Africa, and in England. Susie has a Master of Science degree in Environmental Science from the University of Cape Town, awarded with distinction. In addition to having published a number of peer-reviewed papers, Susie has prepared guidelines on reviewing impact assessments and edited a book on Strategic Environmental Assessment in South Africa. She lectures part time at the University of Cape Town. Susie is a past Chair of the Biodiversity and Ecology Section of the International Association for Impact Assessment (IAIA), a Member of the Advisory Committee/ Group for the international Business and Biodiversity Offsets Programme (BBOP) and past Chairperson of the Southern African Institute of Ecologists and Environmental Scientists.

**Mark Hodges** (USA) is Vice President for Environmental Technologies and Services at Horne Engineering Services, LLC, Fairfax, Virginia, USA, and also engages in independent



consultancies in environmental engineering in the international market. His work is primarily in the area of environmental and social impact assessments (ESIA) for the energy and fossil fuel sectors, with emphasis on air pollution and meteorological monitoring, emissions inventories, dispersion modeling and pollution control technologies. He has worked in or for over 50 countries, including the Republic of South Africa. His prior work includes management, editing and contribution to writing of the US Agency for International Development (USAID)-funded ESIA Guides for Thermal and Hydroelectric Power Projects for member countries of the Southern African Power Pool (SAPP). His education was in environmental engineering sciences at the University of Florida, where he completed the Master of Science in Environmental Engineering.

**Jacob W. Kijne** (Netherlands) is the former Director for Research of the International Water Management Institute in Sri Lanka. Before this he worked for four years, heading the Institute's program, in Pakistan. Dr. Kijne has been a university teacher, and has undertaken research in irrigation and water management internationally, holding long term positions in Venezuela, Kenya, Australia and the Netherlands. Water management consultancies for UN and bilateral aid agencies have taken him to many countries, including India, Iraq, Yemen, Mexico, Tunisia, Egypt and Liberia. He was the main editor of 'Water Productivity in Agriculture: Limits and Opportunities for Improvement', published in 2003 by CABI Publishing. He has published more than 100 papers in refereed journals and has for several years been an associate editor of *Irrigation Science*. His education was in the Netherlands (BSc) and the US (MSc in irrigation and PhD in soil physics).

**Anthony Leiman** (South Africa) is Associate Professor of Economics at the University of Cape Town's School of Economics. He has worked extensively in the fields of Environmental Economics and Project Appraisal as a teacher, a researcher and a consultant. He co-authored the Western Cape Government's guidelines for involvement of economists in environmental impact assessment and a user's guide to cost benefit analysis for the South African Government. His research has included work on measures to control air pollution, and studies of coal mining and energy supply.

**Mohan Munasinghe** (Sri Lanka) is Chairman of the Munasinghe Institute of Development, Colombo; Professor of Sustainable Development, SCI, University of Manchester, UK; Distinguished Guest Professor, Peking University; and Honorary Senior Advisor to the Government of Sri Lanka. He shared the 2007 Nobel Prize for Peace, as Vice Chairman, UN Intergovernmental Panel on Climate Change (IPCC-AR4), for work on global warming and sustainable development. He has earned post-graduate degrees in engineering, physics and development economics from Cambridge University, MIT, and McGill University and Concordia University. Professor Munasinghe has also received several honorary doctorates. Highlights from 40 years of distinguished public service include working as Senior Advisor (Energy and Information Technology) to the President of Sri Lanka; Advisor to the US Council on Environmental Quality; Senior Advisor/Manager, World Bank; and Chairman, Computer and Information Technology Council of Sri Lanka. He is recognized as a world authority on sustainable development, climate change, energy, economics and environment. He has direct project experience in many developing countries, on climate change, disaster management, economics (macro and micro), environment, energy, telecommunications,

transport, urban infrastructure, and water resources. He has won a number of international prizes and medals for research, and taught at many leading universities worldwide. He has authored 93 books and over 350 technical papers. He is Fellow of several international Academies of Science, and serves on the editorial boards of over a dozen professional journals.

**William A. Ward** (USA) is Professor of Economics at Clemson University in South Carolina. Previous non-academic positions include Sr. Economist at the World Bank and President of the Institute for Development Programs. He has authored/co-authored three books on project and policy economics (with a fourth scheduled for publication in 2012) and has assisted in writing the guidelines on project economic analysis for five countries and three international organizations. He has appraised or evaluated more than 100 investment projects in more than 25 countries and has conducted organizational development consultancies for more than two dozen government investment budgeting agencies and a dozen development banks and has conducted reviews of the quality of project economic analyses in the World Bank, the International Finance Corporation, and the Asian Development Bank and designed/conducted project economics training programs for these and other international finance and development organizations. He holds a Ph.D. degree from Michigan State University.

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# SOUTH AFRICA ESKOM INVESTMENT SUPPORT PROJECT EXISTING AND PROPOSED PIPELINES FOR WATER SUPPLY Request for Inspection

- EXISTING PIPELINES
- EXISTING PIPELINE TO BE DEBOTTLENECKED UNDER PHASE 1
- PROJECT PIPELINES
- BUILT-UP AREAS
- NATIONAL ROADS
- MAIN ROADS
- SECONDARY ROADS
- RAILROADS
- INTERNATIONAL BOUNDARIES
- DISTRICT COUNCIL BOUNDARIES
- LOCAL MUNICIPALITY BOUNDARIES

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