

## 22. THE WORLD BANK

### 22.1 Energy Policies and Actions

In the World Bank (the Bank), there is the Energy and Mining Sector Board which sets the course for the Bank's energy policy and strategy. The Board's mission is to support the Bank Group's objectives of reducing poverty and increasing sustainable economic growth in developing and transition economies.<sup>387</sup> The Board works to help developing countries (i) to improve access to clean, modern and affordable energy services, and (ii) to achieve sustainability in the environmental, financial and fiscal aspects of their energy sectors.<sup>388</sup>

In December 2001, the Board issued a paper called "The World Bank Group's Energy Program - Poverty Reduction, Sustainability and Selectivity" which sets the strategy for the energy business of the Bank. The paper also defines the energy sector challenges facing in developing countries and outlines strategic directions for the Bank's assistance for meeting these challenges. It shows that energy issues remain at the core of activities for promoting economic growth and poverty reduction. The policy measures that the Bank supports in its energy business are summarised in **Exhibit WB-1**.

There is an environmental strategy on energy sector named "Fuel for Thought" issued in June 2000, which highlights the importance for the need to help clients tackle global climate change by capturing win-win opportunities for improving energy efficiency and promoting distributed and off-grid electricity supply in rural areas, using clean technologies and fuels. The policy areas on energy sector include: (i) policies that respond to the manner in which energy-environment issues impact the overall country development objectives; (ii) substitution of traditional fuels by modern energy and new energy technologies; (iii) promotion of energy sector institution restructuring.<sup>389</sup>

Since 1990, the Bank has worked in sustainable energy projects and programmes related to renewable energy and energy efficiency over the world. It supports all kinds of renewable energy development, such as run-of-river and small hydropower, solar energy for heat and power, wind energy for mechanical and electrical power generation, and geothermal and biomass energy for power generation and heat. It also supports for energy efficient equipment and processes, the development of energy efficiency businesses and financing mechanisms, and investments to reduce the energy used in district heating.<sup>390</sup>

The Bank's annual Energy Week is one of the foremost gatherings of policy makers and practitioners engaged on strategic issues of energy and development. Themes taken up at Energy Week 2006 included: energy security; clean energy and low carbon energy development; governance and anti-corruption in the energy sector; and energy for growth and poverty reduction in Africa.

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<sup>387</sup> Referenced to the WB web site for energy sector:  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY/0,,contentMDK:20266309~menuPK:542210~pagePK:148956~piPK:216618~theSitePK:336806,00.html>

<sup>388</sup> Referenced to the WB web site for energy sector:  
<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY/0,,contentMDK:20460795~menuPK:542216~pagePK:148956~piPK:216618~theSitePK:336806,00.html>

<sup>389</sup> Referenced to the environmental strategy on energy sector "Fuel for Thought",  
[http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2000/09/01/000094946\\_0008040539585/Rendered/PDF/multi\\_page.pdf](http://www-wds.worldbank.org/external/default/WDSPContentServer/WDSP/IB/2000/09/01/000094946_0008040539585/Rendered/PDF/multi_page.pdf)

<sup>390</sup> Extracted from the report of Renewable Energy for Development: the Role of the World Bank Group,  
[http://siteresources.worldbank.org/INTENERGY/Resources/Renewable\\_Energy\\_Brochure.pdf](http://siteresources.worldbank.org/INTENERGY/Resources/Renewable_Energy_Brochure.pdf)

The Bank works in partnership with all stakeholders interested in improving energy services in developing countries. Some programmes organised by the Bank include:

**Asia Alternative Energy Program (ASTAE):** A World Bank regional program to bring alternative energy (renewable energy and energy efficiency) into the mainstream of the Bank's power sector lending operations in Asia.

**Carbon Finance at the World Bank:** The Carbon Finance business manages a family of trust funds that purchase greenhouse gas emission reductions on behalf of public and private participants to ensure that developing countries and economies in transition can benefit from international efforts to address climate change.

**Climate Change Group:** This World Bank team is established to provide resources and expertise for the World Bank's participation in international climate change negotiations, and provide technical advice to the Global Environment Facility on the preparation of climate change mitigation projects in energy efficiency and renewable energy.

**Environmental Management for Power Development (EMPOWER):** A collaborative program coordinated by the Bank to support the integration of environmental concerns into project and power system planning in developing countries.

**Energy Sector Management Assistance Programme (ESMAP):** A global technical assistance program managed by the Bank to help building consensus and provide policy advice on sustainable energy development to governments of developing countries and economies in transition.



Wind farm<sup>391</sup>



Coal mine<sup>392</sup>

<sup>391</sup> Source:

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTENERGY/0,,contentMDK:20708340~pagePK:210058~piPK:210062~theSitePK:336806,00.html>

<sup>392</sup> Source:

<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/SOUTHASIAEXT/EXTSAREGTOPWATRES/0,,contentMDK:20275624~pagePK:34004173~piPK:34003707~theSitePK:494236,00.html>

**Exhibit WB-1 Policy Measures that the Bank supports in its Energy Business<sup>393</sup>**

• Helping the Poor Directly

- Facilitating access to modern fuels and electricity
- Reducing the cost and improving the quality of energy supplied to low-income households
- Ensuring that energy subsidies are targeted to and reach the poor
- Promoting energy-efficient and less polluting end-use technologies for traditional fuels
- Creating energy service enterprises run by the poor
- Supporting energy needed for social services (health, education, communication)

• Improving Macroeconomic and Fiscal Balances

- Rationalizing energy taxes
- Replacing public investments with private ones
- Managing risks associated with contingent public liabilities
- Closing loss-making coal mines and oil refineries and financing restructuring costs that fall on government budgets
- Enhancing effective payment by all energy users to eliminate operating subsidies to state-owned enterprises
- Improving procurement and marketing of imported and exported energy products

• Promoting Good Governance and Private Sector Development

- Creating objective, transparent, and nondiscriminatory regulatory mechanisms
- Introducing and expanding competition and cross-border trade
- Divesting assets to strategic investors and regulating markets in ways that are socially responsible and corruption free
- Catalyzing private investment by liberalizing entry to energy markets
- Strengthening the voice of consumers and communities
- Strengthening local financial institutions to provide long-term financing for rural energy business

• Protecting the Environment

- Promoting clean transport fuels and switching from coal to gas
- Facilitating environmentally sustainable extraction, production, processing, transport, and distribution of oil, gas, and coal
- Strengthening environmental management capacity in energy supply
- Removing market and regulatory barriers to renewable energy and energy efficiency investments for power and biomass (such as improved cooking stoves for the poor)
- Reducing gas flaring and facilitating carbon trading and joint investments to reduce greenhouse gas emissions

<sup>393</sup> Extracted from the "The World Bank Group's Energy Program - Poverty Reduction, Sustainability and Selectivity", <http://siteresources.worldbank.org/INTENERGY/Publications/20269216/energybrochure.pdf>

## 22.2 Environmental Evaluation/SEA in the World Bank

The Bank has first introduced an environmental assessment (EA) policy, Operational Directive (OD) 4.01 in 1989. This policy was then converted in 1999 into a new format: the Operational Policy/Bank Procedure (OP/BP 4.01).<sup>394</sup> The OP/BP 4.01 states the **administrative** requirement for the Borrower to conduct **sectoral and regional EA** for a strategy, policy, plan, programme or a series of projects for a specific region/sector.<sup>395</sup>

**Sectoral EA** shall address issues early in the process of decision-making, in order to eliminate environmentally damaging alternatives and reduce the information requirement for project level EA. **Regional EA** (e.g. for an urban area, a watershed or a coastal zone) shall adopt a spatial and area-wide approach to development planning. It is acknowledged to have useful potential for addressing cumulative effects.<sup>396</sup> Both types of EA (i) evaluate and compare the impacts against the alternative options, (ii) assess legal and institutional aspects relevant to the issues and impacts, and (iii) recommend broad measures to strengthen environmental management in the sector.<sup>397</sup>

The EAs take into account (i) the natural environment (including air, water and land), (ii) human health and safety, (iii) social aspects (including voluntary resettlement, indigenous peoples and cultural property), and (iv) transboundary and global environmental aspects (including climate change, ozone-depleting substances, pollution of international waters, and adverse impacts on biodiversity).<sup>398</sup>

In order to decide the nature and extent of the EAs to be carried out, the process begins with environmental screening at the time when a strategy, policy, plan, programme or a series of projects is identified. While determining the nature and magnitude of the potential environmental and social impacts of the strategy, policy, plan, programme or a series of projects, it is assigned to one of the following four environmental categories:<sup>399</sup>

**Category A:** likely to have significant adverse environmental impacts that are sensitive, diverse or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. Borrowers are required to conduct an EA in the form of sectoral or regional EA.

<sup>394</sup> Extracted from

<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/EXTENVASS/0,,contentMDK:20482652~menuPK:1182600~pagePK:148956~piPK:216618~theSitePK:407988,00.html>.

<sup>395</sup> Strategic Environmental Assessment: A sourcebook and reference guide to international experience, Barry Dalal-Clayton and Barry Sadler, 2004, [http://www.iiied.org/Gov/spa/documents/SEAbook/Chapter4\\_Oct04.pdf](http://www.iiied.org/Gov/spa/documents/SEAbook/Chapter4_Oct04.pdf), page 113

<sup>396</sup> Strategic Environmental Assessment: A sourcebook and reference guide to international experience, Barry Dalal-Clayton and Barry Sadler, 2004, [http://www.iiied.org/Gov/spa/documents/SEAbook/Chapter4\\_Oct04.pdf](http://www.iiied.org/Gov/spa/documents/SEAbook/Chapter4_Oct04.pdf), page 114

<sup>397</sup> OP/BC 4.01, Annex A,

<http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/8e4afd05557f6161852566c70078f44b/adfa44de7dc526678525672c007d0973?OpenDocument>

<sup>398</sup> OP/BC 4.01,

<http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/tocall/9367A2A9D9DAEED38525672C007D0972?OpenDocument>, originated from the web site of the World Bank

<sup>399</sup> Extracted from "Pollution Prevention and Abatement Handbook" by World Bank Group under the section "Environmental Assessment Process",

[http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p\\_ppah\\_basicEAP/\\$FILE/HandbookTheEnvironmentalAssessmentProcess.pdf#search=%22Environmental%20Assessment%20%22OD%204.01%20%22%22](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_ppah_basicEAP/$FILE/HandbookTheEnvironmentalAssessmentProcess.pdf#search=%22Environmental%20Assessment%20%22OD%204.01%20%22%22), page 22

**Category B:** likely to have potential adverse environmental impacts but are less adverse than those of Category A. Borrowers are required to conduct an EA in forms of Project Appraisal Document and Project Information Document, while the scope of EA is narrower than that of Category A.

**Category C:** likely to have minimal or no adverse environmental impacts. No EA is required.

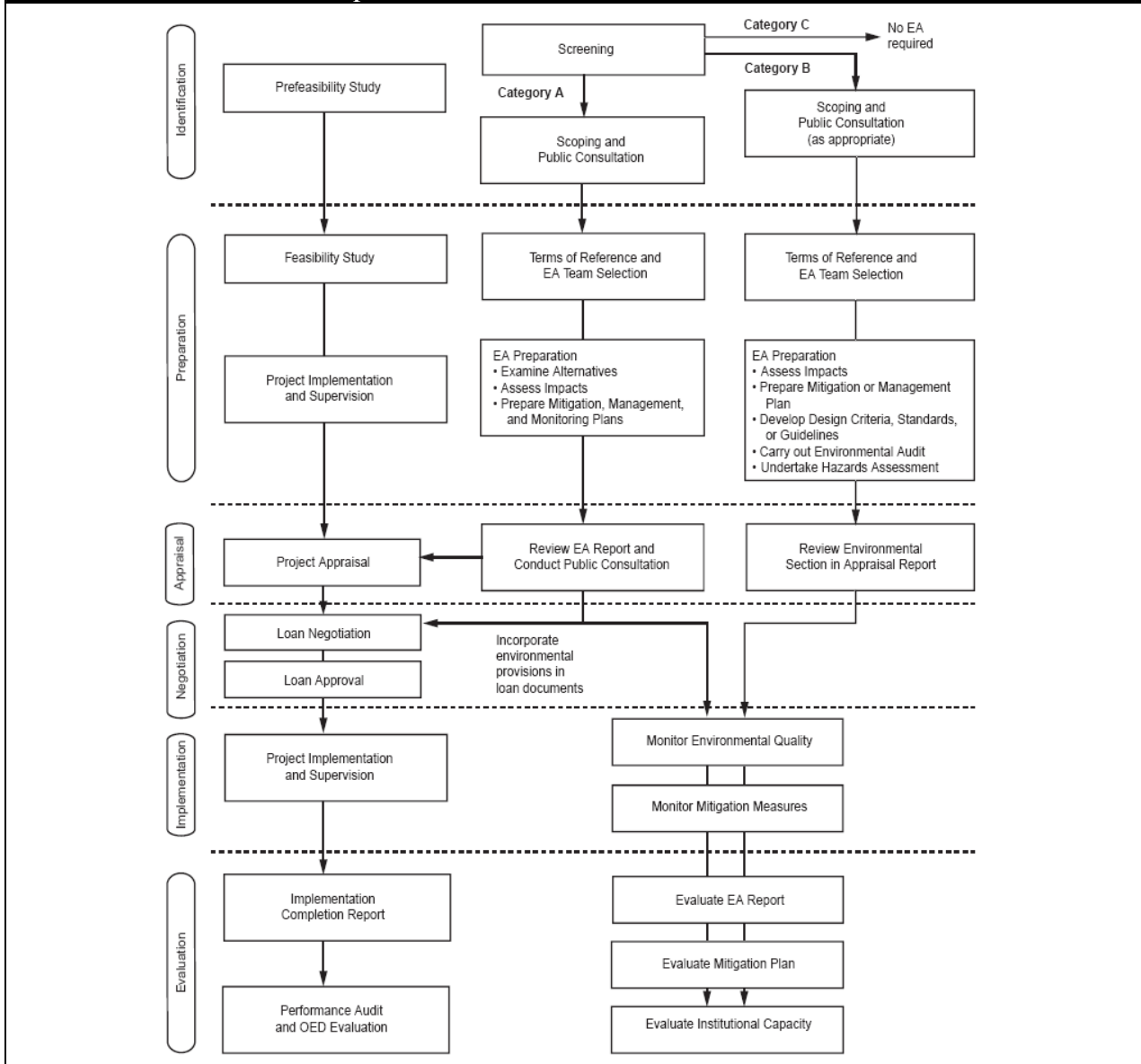
**Category FI:** involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.<sup>400</sup>

The Banks's SEA process is presented in **Exhibit WB-2**.

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<sup>400</sup> OP/BP 4.01, Section 8,  
<http://wbln0018.worldbank.org/Institutional/Manuals/OpManual.nsf/tocall/9367A2A9D9DAEED38525672C007D0972?OpenDocument>, , originated from the web site of the World Bank

**Exhibit WB-2 Overall process flowchart for Environmental Assessment**



Stage 1: Screening – to decide the nature and extent of the EA to be carried out, and to determine which Category the proposal belongs to.

Stage 2: Scoping and Development of Terms of Reference (TOR) – to identify key issues and develop the TOR for the EA.

Stage 3: Preparing the Environmental Assessment Report (public consultation is required throughout the preparation of EA report) – this depends on which category the proposal refers to.

Stage 4: EA Review and Project Appraisal – the borrower shall submit the draft report to the Bank for review and proceed to appraisal.<sup>401</sup>

<sup>401</sup> Referenced to the “Pollution Prevention and Abatement handbook” by the World Bank Group under the section “The Environmental Assessment Process”, [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p\\_ppah\\_basicEAP/\\$FILE/HandbookTheEnvironmentalAssessmentProcess.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_ppah_basicEAP/$FILE/HandbookTheEnvironmentalAssessmentProcess.pdf), page 22-25

## 22.3 Environmental Evaluation/SEA on Energy Policies and Actions in the World Bank

### Strategic Environmental Assessment

For any policy, plan or programme related to energy sector, it follows the requirements of OP/BP 4.01 as such an EA should be carried out depending on the impact significance, and is classified as one of the category - A, B, C and FI. Detailed requirements of OP/BP 4.01 can be referred to Section 22.2.

### Other Strategic Environmental Analyses

Energy and Environment Reviews (EERs) are a specific example of upstream analytical work on environmental issues related to the energy sector. Strengthening environmentally responsible energy strategies through EERs extends the traditional work of the Bank's energy sector by addressing the cross-sectoral environmental impacts associated with energy production and consumption at the local, regional and global levels. EERs aim to:

- Ensure that fuel and technology choices are considered before they are frozen in the context of specific project designs
- Maximise cost-effectiveness by examining pollution prevention and reduction options across the fuel supply and consumption chain
- Expand local participation and capacity building among analysts and decision makers.<sup>402</sup>

Three general types of EERs have been undertaken, including:

- full-scale, which look comprehensively at energy and environment issues in one of more sectors in a country
- rapid assessments
- targeted issues, such as fuel quality, sulfur emissions, or indoor air quality

Full-scale EERs/more targeted EERs are underway or have been completed in different regions, which are often supported by the joint United Nations Development Programme - World Bank Energy Sector Management Assistance Programme. Although a limited number of EERs have been completed to date, the Bank is currently reviewing the results and impacts that EERs have had, and to what extent, and in what ways, EERs can be a useful tool for influencing energy and environment policy and interventions in client countries.<sup>403</sup>

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<sup>402</sup> Extracted from the document of "Making Sustainable Commitments: An Environment Strategy for the World Bank", <http://siteresources.worldbank.org/INTCC/Miscellaneous/20733920/EnvStrategyAnnexF2001.pdf>

<sup>403</sup> Referenced to the web site of world bank - environment sector, <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/ENVIRONMENT/0,,contentMDK:20274473~menuPK:549261~pagePK:148956~piPK:216618~theSitePK:244381,00.html>

A summary table for the energy policies and actions and SEA status in World Bank is presented in **Exhibit WB-3**.

| <b>Exhibit WB-3 Summary of Energy Policies and Actions and SEA Status in the World Bank</b> |  |
|---|--|
| <b>(a) Energy Policies and Actions</b>  |  |
| <b>Energy Policies and Actions</b>  | <ul style="list-style-type: none"> <li>● The World Bank Group's Energy Program</li> <li>● Environmental Strategy on energy sector - "Fuel for Thought"</li> <li>● Energy Week</li> <li>● Asia Alternative Energy Program (ASTAE)</li> <li>● Carbon Finance at the World Bank</li> <li>● Climate Change Group</li> <li>● Environmental Management for Power Development (EMPOWER)</li> <li>● Energy Sector Management Assistance Programme (ESMAP)</li> </ul> |
| <b>Guidance/Legislations for Energy</b>   | N/A  |
| <b>(b) Environmental Evaluations / SEA Status in Energy Policies and Actions</b>            |  |
| <b>Type of Assessment</b>   | Sectoral / Regional Environmental Assessment   |
| <b>Requirement Mechanisms</b>   | Administrative   |
| <b>Legislation for Environmental Evaluation / SEA</b>                                       | Operational Policy / Bank Procedure (OP / BP 4.01)   |
| <b>Applications</b>   | Policies, Plans and Programmes   |



## 22.4 Analysis and Conclusions

In the World Bank, there is the Energy and Mining Sector Board which sets the course for the Bank's energy policy and strategy. "The World Bank Group's Energy Program - Poverty Reduction, Sustainability and Selectivity", issued by the Board, sets the strategy for the energy business of the Bank. The paper defines the energy sector challenges facing in developing countries and outlines strategic directions for the Bank's assistance for meeting these challenges. There is another environmental strategy, "Fuel for Thought", which helps clients tackle global climate change by capturing win-win opportunities for improving energy efficiency and promoting distributed and off-grid electricity supply in rural areas, using clean technologies and fuels. The Bank supported and worked in various sustainable energy projects and programmes related to renewable energy and energy efficiency over the world. The Bank also works in partnership with stakeholders that are interested in improving energy services in developing countries.

In Hong Kong, the key energy policy objectives are to increase and sustain conservation of energy in order to reduce the growing trend of energy use. One of the approaches is to develop renewable energy, which is a cleaner energy source and it does not produce carbon dioxide and other greenhouse gas emissions. Other approaches include launching different programmes and campaigns in order to promote energy conservation and efficiency, to arouse public awareness in global warming effect and to educate the public the correct ways to consume energy. Those activities include "Action Blue Sky" campaign, Energy Efficiency Registration Scheme for Buildings and Energy Efficiency Labelling Scheme.

Regarding the provisions of the Environmental Evaluation/SEA in the World Bank, it is an administrative requirement for the borrowers of the Bank to conduct environmental assessment for policies, plans and programmes in energy sector under the OP/BP 4.01.

Four categories for an initiated proposal, namely Category A, B, C and FI, are defined in the Bank. Generally, a proposal should have a preliminary screening to see which category it refers to, and to decide what to do next for the decision-making process.

Category A and B refer to those proposals that are likely to have significant and less significant adverse environmental impacts respectively. An environmental assessment should be conducted for both categories, but a more in-depth analysis including consideration of alternatives should be carried out for Category A.

In Hong Kong, categorisation of proposals can be conducted in a more comprehensive way, such that all levels of environmental assessments can be carry out to determine the environmental impacts and the associate mitigation measures. It would save cost and time to prepare and review different levels of documentations depending on the impact significance.

## 22.5 Examples of Energy Policies/Actions or their Environmental Evaluation/SEA

| <b>Example WB-1 Strategic sectoral, social and environmental assessment of power development options in the Nile Equatorial Lakes Region <sup>404</sup></b> |   |
|---|---|
| <b>Type of Study</b>  | Strategic social and environmental assessment (Required administratively under the World Bank OP/BP 4.01)   |
| <b>Description of Study</b>   | <p>The purpose of the Strategic/Sectoral Social and Environmental Assessment (SSEA) is to provide an analysis of the social and environmental issues on possible power development options in the Nile Equatorial Lakes Region of Africa and to rank the various options based on a combination of cost, social, environmental and risk considerations.</p> <p>The SSEA is intended to produce strategic/sectoral level guidance to decision-making in the power sector at the regional and national levels and therefore includes an assessment of cumulative environmental and social impacts of different regional power development portfolios.</p> <p>The SSEA presents a Nile Equatorial Lakes Subsidiary Action Programme (NELSAP) Indicative Power Development Strategy to meet a medium level of growth in the demand for electricity in the region including recommendations for further studies of identified power options as well as advice related to the legal and regulatory framework. The strategy includes a preferred project portfolio of options defined as the NELSAP Indicative Power Development Plan.</p> |
| <b>Summary of Alternatives</b>  | <p>New electricity generation options considered in the study included:</p> <ul style="list-style-type: none"> <li>● Thermal Power Options</li> <li>● Geothermal</li> <li>● Biomass</li> <li>● Wind Energy Conservation Systems</li> <li>● Demand Side Management and Loss Reduction</li> <li>● Imports from Outside the NELSAP Region</li> <li>● Off-grid Options</li> </ul>   |
| <b>Scope of Assessment/ Study</b>   | <p>Some main environmental impacts due to different electricity generation options can be summarised as follow:</p> <ul style="list-style-type: none"> <li>● Flooding of natural habitats and reduction of biological diversity</li> <li>● Proliferation of invasive aquatic vegetation</li> <li>● Impact on landscapes, cultural sites and tourism</li> <li>● Sedimentation, erosion and changes in water quality</li> <li>● Possible contamination of soil and groundwater table</li> <li>● Land use conflicts</li> <li>● Impacts on landscapes</li> <li>● Noise pollution</li> <li>● Waste disposal</li> <li>● Greenhouse gas emissions</li> </ul>   |
| <b>Environmental Measures</b>   | <p>For hydropower option, some of the mitigation plans for the impacts on designated habitats and natural sites are:</p> <ul style="list-style-type: none"> <li>● Protection of land area at a level equivalent to or better in ecological value than the lost land.</li> <li>● Conservation of valuable land adjoining the reservoir for ecological purpose</li> </ul>   |

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[http://www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2007/06/11/000112742\\_20070611144540/Rendered/PDF/391990v20REVISED0Vol010Main0Rept.pdf](http://www-wds.worldbank.org/external/default/WDSCContentServer/WDSP/IB/2007/06/11/000112742_20070611144540/Rendered/PDF/391990v20REVISED0Vol010Main0Rept.pdf), pages 7, 120-130, 260-262, 265-267

| <b>Example WB-1 Strategic sectoral, social and environmental assessment of power development options in the Nile Equatorial Lakes Region <sup>404</sup></b> |  |
|---|--|
|   | <p>and erosion prevention.</p> <ul style="list-style-type: none"> <li>● Creation of ecological reserves with rigorous and effective protective measures.</li> <li>● Enhancement of reservoir islands for conservation in order to encourage their use by migratory birds and to support a wide range of flora.</li> </ul> <p>The most effective measures to prevent reservoir sedimentation are:</p> <ul style="list-style-type: none"> <li>● Adequate bank protection in the catchment area.</li> <li>● Reforestation of area showing acute erosion process in the catchment area.</li> <li>● Changes in agriculture practices on slopes susceptible to erosion.</li> <li>● Use of sediment trapping devices upstream.</li> </ul> <p>Some mitigation measures for environmental impacts on the downstream reaches include:</p> <ul style="list-style-type: none"> <li>● Application of a minimum flow at all times;</li> <li>● Water release policies that take account of ecological issues;</li> <li>● Construction of bottom outlets;</li> <li>● Periodic releases of water to recreate annual flooding cycle;</li> </ul>                                |
| <b>Outcome of Study</b>   | <ul style="list-style-type: none"> <li>● The cumulative impacts on the environment from multiple hydro projects in a river basin or several thermal plants compared at the global level are relatively minor. The most significant would be emissions from thermal plants and potential impacts on wetlands in the Kagera River and the Rufiji River.</li> <li>● Only two of the five river basins studied flow into the Nile beyond the Victoria Nile. These contain only four hydro power development options (Bujagali, Kakono, Karuma and Rusumo Falls). Appropriate operation of these options will allow the flows out of the Lake Albert towards the Sudan and the Sudd marshes to simulate the natural flow patterns.</li> <li>● The runoff in the northern part of the region is expected to increase due to climate changes. On the other hand, the runoff in Southern Tanzania is expected to remain at current levels or to decrease slightly.</li> <li>● The overall impact of climate change on the power output of the NELSAP Indicative Power Development Portfolio is expected to be positive over the period of the assessment.</li> </ul> |

| Example WB-2 Lao PDR Hydropower Strategic Impact Assessment (SIA) <sup>405</sup> |   |
|--|---|
| <b>Type of Study</b>   | Strategic Impact assessment (Required administratively under the World Bank OP/BP 4.01)   |
| <b>Description of Study</b>  | <p>Lao PDR is situated in the Lower Mekong Basin. The country has the largest hydropower potential in the region but only a small percentage of it has been developed to date. This SIA was prepared to identify the numerous strategic opportunities at the sector level and to avoid impacts and improve environmental and social management.</p> <p>The SIA will cover planned hydropower developments in Lao PDR in a 20-year perspective. The SIA will contribute to the understanding of the impacts of hydropower development in Lao PDR and recommend measures strengthening the sector in order to reduce impacts and manage the sector in an environmentally and socially sustainable manner.</p>         |
| <b>Summary of Alternatives</b>   | <ul style="list-style-type: none"> <li>● Besides hydropower, the availability and potential of other primary energy sources include lignite, coal, solar and biomass power generation.</li> <li>● Alternative power development plans such as “Nam Theun 2: Study of Alternatives”, “Se Kong, Se San and Nam Theun River Basins Study”, etc.</li> </ul>   |
| <b>Scope of Assessment/ Study</b>  | <p>The evaluation parameters considered in the study include:</p> <ul style="list-style-type: none"> <li>● Impacts on biodiversity</li> <li>● Downstream loss of river ecosystems</li> <li>● Irrigation and water supply</li> <li>● Flood protection</li> <li>● River blockage</li> <li>● Land take and inundation</li> <li>● Resettlement</li> <li>● Interference with ethnic minorities</li> <li>● Tourist attractions and scenic waterfalls</li> <li>● Downstream Mekong hydrology and water use</li> <li>● Downstream impacts in Vietnam</li> </ul>   |
| <b>Environmental Measures</b>  | <p>Some recommendations for the mitigation of the problems and challenges in hydropower development include:</p> <ul style="list-style-type: none"> <li>● Mitigation and compensation related to the construction and operation of hydropower schemes including both water related and land based mitigations.</li> <li>● Potential impacts that cannot be mitigated may need Compensatory Development and Management Programmes such as fisheries development plans.</li> <li>● Supplementary management initiatives for integrated water resources management</li> <li>● Improvement of system for planning and assessment of hydropower projects</li> <li>● Institutional strengthening and training.</li> </ul> |
| <b>Outcome of Study</b>  | <ul style="list-style-type: none"> <li>● The hydropower sector seems to be one of the most thoroughly planned sectors in Lao PDR from an economic and technical viewpoint.</li> <li>● The SIA has assisted the planning for “better” projects, identifying needs for mitigation and compensation, and increasing the general understanding and knowledge of the environmental and social situation in Lao PDR.</li> <li>● It is likely that the negative impacts on primary forest and unique wildlife</li> </ul>   |

<sup>405</sup> <http://siteresources.worldbank.org/INTLAOPRD/Resources/SIANovember2004.pdf>, page 3, 5, 30-31, 56-59, 60-64, 65-73

**Example WB-2 Lao PDR Hydropower Strategic Impact Assessment (SIA) <sup>405</sup>**

|  |   |
|--|---|
|  | <p>found in the mountainous areas of Lao PDR will be significant.</p> <ul style="list-style-type: none"><li>• There are actions that can be taken to avoid, minimise or compensate for potential negative impacts of planned hydropower schemes. In general these include mitigation and compensation related to construction and operation and to compensatory programmes.</li></ul> |
|--|---|