

PROJECT INFORMATION DOCUMENT (PID)
UPDATE: Joint PID for NT2 and NTSEP

Report No.: 30856

Project Name	Nam Theun 2 (NT2) Hydropower Project and the Nam Theun 2 Social and Environment Project (NTSEP)
Region	EAST ASIA AND PACIFIC
Sector	NT2 (IDA partial risk guarantee operation and MIGA guarantee operation): Infrastructure services for private sector development; power (100%) NTSEP: General water, biodiversity, and flood protection sector (100%)
Project ID	P076445
Borrower(s)	Government of Lao PDR through the Ministry of Finance
Implementing Agency	Ministries of Industry and Handicraft and Finance, Lao PDR Nam Theun 2 Power Company (NTPC)
Environment Category	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
Safeguard Classification	<input checked="" type="checkbox"/> S ₁ <input type="checkbox"/> S ₂ <input type="checkbox"/> S ₃ <input type="checkbox"/> S _F <input type="checkbox"/> TBD (to be determined)
Date PID Prepared	November 24, 2004
Estimated Date of Appraisal Authorization	Pending confirmation of publication of safeguards documents, and receipt of GoL's revenue management program and a monitoring and evaluation framework
Estimated Date of Board Approval	TBD based on completion of appraisal

Key development issues and rationale for Bank involvement

1. **Country background.** The Lao People's Democratic Republic (Lao PDR) is the poorest and least developed country in the East Asia region. The estimated annual per capita income in 2003 was USD 320, and social indicators are among the lowest in the region. Over the past two decades, Lao PDR's economy has been moving gradually toward a market-oriented system; more recently, its economic outlook has been improving and growth has been around 6 percent.

2. However, to meet its poverty reduction and economic growth targets, Lao PDR must achieve GDP growth averaging 7 percent per year up to 2020. The World Bank's recent "Country Economic Memorandum" (CEM) concluded that with its vast natural resources and central position in the rapidly growing Greater Mekong Subregion (GMS),¹ Lao PDR is well-placed to accelerate growth and reduce poverty, provided it increases the contribution of natural resources to development in a sustainable manner, fosters a more enabling environment to attract increased private sector investment, and makes progress on extensive reforms to improve the quality of governance, management of public finances, and service delivery.

¹ The GMS comprises Lao PDR, Thailand, Vietnam, Cambodia, Myanmar, and Yunnan Province of the People's Republic of China.

3. The CEM and Lao PDR's own National Growth and Poverty Eradication Strategy (the NGPES adopted in 2003/2004) note the special role which hydropower could play as one of the strategic growth sectors, based on the country's abundant water resources. The most recent strategic planning exercise for the sector identifies the proposed NT2 project as the best hydropower option currently available to Lao PDR to serve the domestic and regional markets.² As power markets in the GMS evolve towards closer regional cooperation, Lao PDR's substantial hydropower potential and central geographical location within the GMS give it a strategic advantage in promoting regional power trade; it has been a key participant in the development of bilateral power trade, signing memoranda of understanding (MOU) with Thailand and Vietnam to export electricity from hydropower generation.

4. ***Rationale for Bank involvement.*** NT2 incremental revenues could finance a substantial increase in spending on poverty reduction and environmental conservation measures, if used properly. Over the period (2009-2034) covered by the Concession Agreement (CA) and Power Purchase Agreement (PPA), revenues are expected to amount to around 5 percent of projected GoL revenues. While the impact of NT2 on total revenues would be fairly modest, the impact on expenditures could be significant if the revenues are properly targeted. For example, projected NT2 revenues in 2011, adjusted to FY2003 prices, would be equivalent to 52 percent of domestically financed expenditures on education and health in FY2003 and 17 percent of domestically financed expenditures on the four NGPES priority sectors (education, health, agriculture, and transport and communications) in that year. The expenditure impact would be even greater if revenues are allocated to a small number of programs, such as basic health and education, rural roads and water supply.

5. The project is economically and technically sound, it provides satisfactory returns for Lao PDR, and it offers an attractive alternative source of power for Thailand. First, the 25-year, "take-or-pay" EGAT Power Purchase Agreement provides a reliable market for the power to be generated and, together with the CA, provides an adequate legal foundation for the project. The base case economic rate of return is estimated to be about 17 percent, and the project remains economically viable even under various downside scenarios. Second, the GoL receives about 40 percent of the real, discounted net project returns (taxes, royalties and dividends), which is reasonable considering that GoL is a 25 percent equity partner and that most of the project's completion and delay risk is allocated to other parties. Finally, power demand in Thailand is growing at a robust rate of about 6.5 percent per year and is expected to require the power supplied by NT2 when the project comes on line in 2009/2010. In commercial terms, the cost of the project's power to Thailand is competitive with the alternative least-cost source of incremental power supply - combined-cycle gas turbines (CCGT), taking into account projected natural gas prices, the capital cost of recent CCGT plants in Southeast Asia and the current estimated base project cost. Additionally, NT2 hydropower provides the Thai system with a useful diversification of supply close to northeast Thailand, an area that is underserved. For these reasons, the Lao government (GoL) accords the highest priority to development of the NT2 project, which has been under consideration by the GoL and various developers since the late 1980s.

² Power Sector Development Plan (PSDP), Maunsell/Lahmeyer International, August 2004.

6. The GoL, the project sponsors and the international lending syndicate consider World Bank Group participation essential, not only for its proposed financial contribution and its ability to provide comfort to the private lenders through proposed IDA and MIGA guarantees, but also because of its expertise in project appraisal and supervision and its capacity to address sector, regulatory and government performance areas, such as safeguards and revenue management, which concern the private lenders but where it is difficult for the private sector to exert influence. Furthermore, the NT2 project catalyzes Lao PDR's efforts to improve its development framework and carry out broad reforms in its economy and also provides an opportunity to reverse the recent trend toward unsustainable exploitation of Lao PDR's natural resources and improve social protection of indigenous peoples.

7. ***Project-related risks and how these are addressed.*** Despite its promising aspects, the NT2 project entails a significant number of risks and triggers all ten of the World Bank's safeguards policies. Technical risks include geology and hydrology; macroeconomic or sovereign risks, including public financial management and budgeting systems and governance policies and procedures that are not transparent or accountable; and environmental and social risks in the project area, which consists of three distinct zones: the NT2 watershed (the Nakai Nam Theun National Protected Area and two corridors linking it to other NPAs), the Nakai plateau, and the downstream areas along the Nam Theun and Xe Bang Fai river basins, each with their unique environmental and social impacts and mitigation–compensation requirements.

8. These risks are being addressed through a combination of measures. First, extensive technical preparation, confirmed by a Dam Safety Review Panel, and due diligence carried out by the World Bank and other international financial institutions (IFIs) considering support to the project, suggest that the technical and commercial aspects of the project are straight forward and generally well covered. Second, arrangements for the budgeting, expenditure and accounting of all NT2 revenues accruing to the GoL will be carefully managed and monitored to ensure that those revenues are utilized for priority poverty reduction and conservation programs as agreed between the GoL and the World Bank (see below). Finally, the World Bank and other members of the development community have worked closely with the GoL and NTPC to reach agreement on policies and actions that will mitigate and compensate for the environmental and social impacts of the project. Many of these proposed initiatives are consistent with emerging international good practice.

9. ***Development framework and capacity building.*** By virtue of its size and social/environmental implications, NT2 is expected to play a major role in shaping the policies and development agenda of the GoL and the donor community in Lao PDR beyond the power sector alone. Thus, it has been essential to place NT2 in the broader context of its potential development impact, rather than being viewed simply as an enclave hydropower project. To do so, and to put in place an adequate foundation to ensure that potential revenues are applied effectively to poverty reduction and improved natural resource management, the World Bank constructed the “Decision Framework for NT2” that applies to its decision on support to the project. This framework was agreed in principle with the Government in August 2001 and has been reaffirmed frequently since then; it was made public in July 2002. The framework requires that adequate progress must continue to be made in addressing three critical areas before a Bank decision on support for the proposed project can be considered: (a) implementing a development framework characterized by concrete performance that aims at poverty reduction and

environmental protection; (b) ensuring that the technical, financial and economic aspects of the project and the design and implementation of safeguard policies are of a standard acceptable to the Bank; and (c) obtaining broad support from international donors and civil society for the country's development strategy and the NT2 project itself.

10. Success on the policy and institutional reform front will be measured through progress in the development and implementation of a comprehensive government-driven reform program aimed at strengthening macroeconomic management and initiating broad-based structural reforms to improve the environment for sustained high growth and private investment over the medium term. The NGPES lays the foundation for such reforms and will be supported by the Bank as well as other IFIs and bilateral donors. The Bank's new CAS for Lao PDR, which is expected to draw heavily from the NGPES, is planned for Board consideration in early 2005.

Project development objective

11. The project development objective (PDO) is to generate revenues, through environmentally and socially sustainable exploitation of NT2's hydropower potential, that will be used to finance spending on priority poverty reduction and environmental management programs. Accomplishing this objective will require sustained Government commitment to reform public expenditure management and promote environmental conservation, as well as effective implementation of the NT2 project itself.

12. ***Revenue and expenditure management.*** Achieving the objective that NT2 revenues will be used to increase expenditures on priority poverty alleviation and conservation programs requires agreement on the appropriate use of NT2 revenues and development of an effective, transparent public expenditure management (PEM) system. In order to develop mechanisms for the transparent application of revenues over the longer term, the World Bank and ADB are assisting the GoL in the design of a Public Expenditure Management Strengthening Program (PEMSP). This program seeks to achieve measurable progress in improving budgeting and expenditure planning, accounting and financial reporting, treasury operations and cash management, and internal control and audit. The program builds on and supports the GoL's ongoing reform programs, including the NGPES, and will focus on capacity building initiatives, at both the central and provincial levels (with Khammouane, where NT2 is primarily located, among the pilot provinces). Implementation of the program will be supported by the World Bank through its ongoing Financial Management Capacity Building Project and a proposed sequence of Poverty Reduction Support Credits (PRSCs), in collaboration with ADB, UNDP and several bilateral partners.

13. Recognizing that implementation of system-wide reforms under the PEMSP is likely to take some time, the GoL's agreement has been sought to a number of NT2-specific revenue and expenditure management arrangements, consistent with the broader reform strategy, to provide assurance that NT2 revenues will be applied in line with allocational and transparency objectives from the time of project commissioning.

14. ***Natural resource management and rural livelihoods.*** NT2 project revenues are expected to support environmental conservation activities in the country more broadly through targeted interventions channeled through the Environmental Fund. In addition, through the

complementary Lao Environment and Social Project (LEnS), the environmental management and conservation policies and practices established for the NT2 project with support from NTSEP, would be extended beyond the project area to the provincial and national levels. The LEnS project would encourage the design of sustainable environmental and social policies and build institutional capacity to implement those policies in Lao beyond the NT2 project area.

15. The GoL has also requested that the Bank consider the Xe Bang Fai Rural Livelihoods Project. This project would enhance opportunities for villagers living near, but not within, the areas impacted by the project in the XBF basin to participate in the expected economic growth in Khammouane province. It would seek to provide the basic conditions for market-oriented activities. Village linkages to markets would be strengthened by improving roads and information flows. Marketing organizations would be strengthened and the production base diversified through better management of natural resources, to enable villages and households to respond to expanding market demand. Project activities could include on- and off-grid rural electrification, irrigation and improvements in transport, communications, health services and education.

Project description

16. The proposed NT2 project consists of three components (described below) with an estimated base project cost of USD 1.2 billion. The proposed NTSEP project (described under component 2 below), is a companion project that is integral to NT2, as it will finance part of GoL's equity contribution to the NTPC.

17. **Component 1: Hydropower facility.** The NT2 hydropower facility would have an installed capacity of 1,070 MW, providing 995 megawatt (MW) of power for export to Thailand and an additional 75 MW for domestic use. The main features of the hydropower facility component include: a 48 meter high gravity dam on the Nam Theun river; a 450 square kilometer reservoir; a powerhouse (from which water would flow into the Xe Bang Fai river, also a tributary of the Mekong); a 130 kilometer long, double circuit 500 kV transmission line to the Thai grid; and a 70 kilometer long, single circuit 115 kV transmission line to Lao's domestic grid. The project site is located in the Khammouane and Bolikhamxay provinces in central Lao, about 250 kilometers east of Vientiane, stretching from the Nakai Plateau to the confluence of the lower Xe Bang Fai river with the Mekong. IDA and MIGA guarantees would support about USD 1 billion in private sector funding to finance this project component.

18. **Component 2: Management of environmental and social impacts.** The construction and operation of the NT2 project will cause significant environmental and social impacts in the Nam Theun watershed, Nakai Plateau and downstream areas of the Nam Theun and XBF rivers. The main anticipated impacts are: (i) resettlement, including significant livelihood changes, of about 6,200 persons on the Nakai Plateau due to reservoir inundation; (ii) loss of, or significant modification to, terrestrial and aquatic habitats on the Nakai Plateau resulting from reservoir inundation; (iii) flooding of dry season cultivation zones and loss of physical assets along the Xe Bang Fai river, affecting about 40,000 people on the mainstream and some 11,000 people along the tributaries of the XBF; (iv) ecological impacts relating to changes in water quality and flow on the Xe Bang Fai, the Nam Theun and Nam Kathang, including potentially significant reductions in populations of certain rare aquatic species; (v) potential for substantial negative

changes in the stock and migration of fish used as protein or income sources in all project-affected river systems; (vi) environmental and social impacts such as public health problems, illegal hunting, and social problems associated with the large influx of external workers, including siting and management of work camps; and (vii) land acquisition and environmental issues of construction sites for ancillary works.

19. NTPC estimates that the project will affect about 100,000 ha. of natural habitats, mostly on the Nakai Plateau and the downstream channels of the Nam Theun and Xe Bang Fai. To compensate and offset for habitat loss, the project sponsors have committed to providing long term financial support for the management of the 395,000 ha. of protected areas comprising the Nakai Nam Theun National Protected Area (NNT NPA) and two adjoining corridors connecting it to the Him Nam No and the Phou Hin Poun Protected Areas which together make up the NT2 project watershed. The NNT NPA is the largest protected area in Lao PDR and is considered one the most important areas for biodiversity in South East Asia, forming the center of a cluster of important national protected areas in central Lao PDR. As part of the overall mitigation and compensation offset program, the project will provide USD 31.5 MM to the NNT Watershed Management and Protection Authority (WMPA) during the construction and operations phases to protect the watershed, through long-term support for staff salaries, equipment, and operating costs required to implement effective protection and management programs.

20. The project intends to improve the management of natural resources in Lao PDR, with a special emphasis on biodiversity conservation. To achieve this, the project will focus on developing a regulatory framework that facilitates the science-based management and oversight of conservation interventions in Nakai Nam Theun National Protected Area (NPA) and the two corridors connecting it with Phou Hin Poun and Him Nam No NPAs. The project will also build the capacity of conservation staff to design and implement transparent management plans to protect and conserve these areas, and will work to establish participatory processes at the local level which will involve local communities in the decision-making and land use planning processes that occur in, and at the periphery of, these protected areas.

21. The NT2 project proposes a comprehensive set of specific, proactive environmental and social mitigation activities, as set out in the project's three safeguards documents, to mitigate the impacts cited above and to promote the objective of improved natural resource management. NTPC has budgeted about USD 120 MM for environmental and social costs (including the USD 31.5 MM referred to above), of which about USD 50 MM are capital costs through COD (about 4 percent of the estimated project cost); the remaining USD 70 MM will be funded out of revenues over the 25-year operating period.³

22. The proposed NTSEP project would provide USD 20 MM as a portion of the GoL's equity in NTPC toward the environmental and social (E&S) costs of the project to support the following activities:

³ The current draft of the CA, which provides USD 98.5 MM, will need to be updated to fully reflect changes in the estimated costs to mitigate environmental and social impacts. The final figure could change from the current estimate once the full E&S impact analysis and the mitigation-compensation programs have been agreed.

- *Implementation of the Social Development Plan:* design and resettlement of villages on the Nakai Plateau, including basic infrastructure and social services, design and delivery of alternate livelihood opportunities, and technical assistance (*about USD 14 MM*);
- *Implementation of the Environmental Assessment and Management Plan (EAMP):* environmental mitigation measures, including wildlife management on the plateau and capacity building of GoL's Environmental Management Unit (EMU) (*about USD 2 MM*);
- *Implementation of the Social and Environment Management Framework and Operational Plan (SEMFOF):* enforcement of laws and regulations on wildlife trade and non-sustainable resource use in the NT2 watershed, capacity building at the WMPA, and promotion of sustainable livelihood alternatives for enclave villages within the NPA and the peripheral impact zones (PIZs) (*about USD 3 MM*); and
- *Support for independent monitoring:* by the Dam Safety Review Panel (DSRP) and the Environmental and Social Panel of Experts (POE) to monitor impacts and mitigation measures under the project (*about USD 1 MM*).

23. **Component 3: Monitoring and Evaluation.** The monitoring and evaluation (M&E) framework for the project consists of internal and external activities, including: (i) professional engineering firms under contract to NTPC and the GoL, respectively, to supervise physical implementation of the hydropower project; (ii) the DSRP and the POE (as mandated by the World Bank's safeguard policies); (iii) systematic monitoring of the technical and safeguards components of the project and its impacts by one or more professional firms on behalf of the private and public sector financial institutions; (iv) an International Advisory Group (IAG) to advise the World Bank's senior management on the implementation of this high corporate risk project; (v) independent monitoring of the NT2 watershed and revenue management arrangements; and (vi) supervision by staff of the World Bank and other IFIs. The first four elements would be financed by NTPC and would be a cost of the project; the last two are expected to be financed by the IFIs.

24. The objective of these M&E arrangements is to meet sound engineering practices, fiduciary responsibilities and the respective oversight requirements of the various financial institutions in an efficient, timely and cost-effective manner. They would do so by consolidating the basic supervision requirements of all financial institutions and contracting that oversight to qualified professionals. By harmonizing project reporting and minimizing duplication, this approach would also simplify the work of the financial institutions, focus supervision resources on comprehensive coverage, timely, quality reporting on project progress, outstanding issues and project-related activities, and sharply reduce the reporting burden on NTPC and the GoL. The project would include regular, systematic project progress reporting, disclosure of reports, and a periodic meeting of stakeholders to review project progress and broader aspects of the development framework for the project.

Safeguard policies that might apply

25. NT2 is recognized as a high-risk project because it triggers all of the Bank's ten safeguard policies. The potential project risks and their possible mitigation are being currently evaluated as part of the planning process for developing both the PRG and NTSEP operations. In doing so, the GoL and NTPC are taking a comprehensive approach to identifying the impacts and risks and designing the corresponding mitigation measures that covers the two rivers (Nam Theun and Xe Bang Fai), the proposed reservoir area, the Watershed, and other project lands. The approach also includes assessing the cumulative impacts caused by the project in the immediate region adjacent to the project location, including downstream water issues in Mekong River and cross-border threats to wildlife.

Safeguards Operational Policy	Treatment of Issues by Project Sponsors – NTPC and the Government of Lao
4.01 Environmental Assessment	<ul style="list-style-type: none"> EA process assesses project impacts, analyzes alternatives and develops a management plan to prevent, mitigate or compensate impacts. Cumulative and Strategic Impact Assessments undertaken to assess regional and sectoral issues.
OP 4.04 Natural Habitats	<ul style="list-style-type: none"> Compensation for impacts on natural habitats is provided through financing and institutional and management support for conservation of the NNT NPA and Corridors an area of 395,000 ha of regional and global conservation significance. Development of a wildlife management program to support conservation of key species that may be impacted by the project.
OP 4.09 Pest Management	<ul style="list-style-type: none"> Development of a pest management plan for the resettlement program and construction.
OP 4.12 Involuntary Resettlement	<ul style="list-style-type: none"> Development of a resettlement action plan for the plateau. Development of a resettlement frameworks for the downstream areas and project lands (part of SDP). Development of a resource restriction process framework for the NNT-NPA and peripheral impact zone (PIZ) (part of SEMFOP).
OP 4.20 Indigenous Peoples	<ul style="list-style-type: none"> Development of ethnic minorities development plan for these groups (part of SEMFOP and SDP).
OP 4.36 Forests	<ul style="list-style-type: none"> Development of a time-bound action plan to achieve certification of community based forestry and NTFP harvesting programs. Development of a monitoring program to ensure logging will not encroach in these areas.
OP 4.37 Safety of Dams	<ul style="list-style-type: none"> A Dam Safety Panel of experts was established and advised the construction design team. The Panel will be retained during implementation.
OP 7.50 International Waterways	<ul style="list-style-type: none"> Notification of Riparians of the project was made by GoL through the Mekong River Commission. 4 countries have expressed their no objection to the Project. The Government of Cambodia has asked for more information on the impacts and is currently in discussion with the Government of Lao.
OP 7.60 Disputed Areas	<ul style="list-style-type: none"> The project has designed the transmission line crossing such that no disputed land would be used. GoL and Thailand have entered into agreement on the issue as part of the power purchase agreement.
OPN 11.30 Cultural Property	<ul style="list-style-type: none"> Surveys of the project lands are being undertaken. Mechanisms to manage impacted cultural property are being developed in consultation with affected communities and have been included in the management plan for the construction works.

Tentative financing

Source:	NT2 (\$mm)	NTSEP (\$mm)
Borrower/Recipient	1200.0	0.0
International Development Association: <i>guarantee</i>	50.0 ⁴	-
International Development Association: <i>credit</i>	-	20.0
Multilateral Investment Guarantee Association: <i>guarantee</i>	50.0	

Contact points

Government and Developers

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⁴ As IDA guarantees are accounted for at 25% of face value, only \$12.5 MM of IDA resources would be utilized in providing the proposed \$50 MM guarantee.

List of factual technical documents and organization responsible

A. Major Studies

Environmental / Social

1. Environmental Assessment and Management Plan (EAMP), [NTPC](#)
2. Social Development Plan (SDP), comprised of the Resettlement Action Plan (RAP) and the Ethnic Minorities Development Plan (EMDP), [NTPC](#)
3. Social and Environment Management Framework and First Operational Plan (SEMFOP) -- for the watershed, [GOL](#)
4. Summary Environmental and Social Impact Analysis (SESIA), [NTPC](#)
5. Cumulative Impacts Study, [ADB](#)

Economic / Financial / Technical

6. Regional Least Cost Economic Analysis, [IBRD](#)
7. Summary Economic Analysis, [IBRD](#)
8. Power Sector Development Plan (PSDP), [GOL](#)
9. Country Economic Memorandum (CEM), [IBRD](#)
10. The Proposed Nam Theun 2 Hydropower Project: Understanding the Macro Effects, [IBRD](#)

B. Expert Panel Reports

International Advisory Group (IAG) – convened by IBRD

1. First Report of the IAG, August 19, 1997
2. Second Report of the IAG, December 22, 1998
3. Third Report of the IAG, April 6, 2001
4. Fourth Report of the IAG, March 20, 2004

International Environmental and Social Panel of Experts (POE) – convened by GoL

5. First Report of the POE, February 7, 1997
6. Second Report of the POE, July 26, 1997
7. Third Report of the POE, January 21, 1998
8. Fourth Report of the POE, January 24, 1999
9. Fifth Report of the POE, January 22, 2001
10. Sixth Report of the POE, March 2002
11. Seventh Report of the POE, March 2, 2004

NOTE: This is information on evolving projects. Certain components may not be necessarily included in the final project.

