

Nam Theun 2 (NT2) Hydroelectric Project ¹

On November 27, 2005, more than 300 Lao and Thai Governments officials, diplomats, members of the international community in Laos and project officials gathered at the site of the Nam Theun 2 (NT2) Hydroelectric Project to celebrate the project construction cornerstone inauguration. After delivering their respective speeches, Bounnhang Vorachit, Prime Minister of the Lao PDR; Thaksin Shinawatra, Prime Minister of the Royal Thai Government; and Maurice Portiche, Ambassador of France in the Lao PDR, together pulled the rope to open the curtain revealing a commemorative plaque with the flags of Laos, Thailand and France, at the Nam Theun 2 power house location.

In his speech, Prime Minister Bounnhang recalled that the Nam Theun 2 Hydroelectric Project is “the largest foreign investment in Lao PDR to date and a model of fruitful cooperation.” He emphasized that the power exchange programme that exists between Laos and Thailand “has strengthened integration in the socio-economic development of the two countries and the two peoples,” and that Nam Theun 2 is yet another important piece of this programme. He added, “In the next five years, we also expect to receive indirect development such as socio-economic infrastructure that improves the livelihood of people living in the area, and further build the capacity of our Government staff working in conjunction with the project”.

Accompanied by a delegation of senior members of the Thai Government and media, Prime Minister Thaksin Shinawatra arrived by helicopter from Nakhon Phanom on the Thai side of the Mekong to the site of the ceremony.. In his speech, Mr. Thaksin emphasized the strong relationship that Thailand and Laos have been developing for the past decades and that he was confident in the success of the Nam Theun 2 Project, which he described as part of the joint effort made by ACMECS (Ayeyawady – Chao Phraya – Mekong Economic Cooperation Strategy) countries to seek alternatives energy sources to oil.

NT2 is a major milestone in the economic development of Laos. The total cost of the project is equivalent to over 85% of the country's annual gross domestic product. NT2 will be the largest economic asset and the largest foreign exchange earner in the country, as well as the largest single contributor to the Government's budget. From a macroeconomic standpoint, NT2 is of crucial importance. With anticipated aggregate Government revenues of almost US\$2 billion over the concession period, it will be the largest single contributor to the country's public finance and will allow a considerable improvement of its financial resources aimed at poverty reduction.

More immediately, the project will construct a number of infrastructures, which include 145 km of new and upgraded roads and bridges in the Khammouane province, a 115 kV sub-station and 70 km of 115 kV transmission lines for the Lao grid. The successful financing of the Project has established a track record that will hopefully allow Laos to compete more effectively in the international market for scarce investment and to finance more infrastructure projects.

The Build-Own-Operate-Transfer structure developed for the project has allowed the Government to undertake Nam Theun 2 without incurring the financial risk of fully funding the entire project.

¹ Prepared by Sidharth Sinha, Professor, Indian Institute of Management, Ahmedabad, India for the purpose of class discussion only. This is based on publicly available World Bank and Asian Development Bank (ADB) documents.

Lao country overview

Lao PDR is a small, sparsely populated, landlocked country with extensive natural resources. With a population estimated at 5.7 million in 2004, and growing at a relatively rapid rate of 2.6 percent annually, Lao PDR is characterized by a rich cultural and ethnic diversity where almost half of the population belongs to minority groups concentrated in the upland areas. It covers an area of 236,800 square km in the center of the Mekong region, sharing borders with Thailand, Vietnam, China, Cambodia, and Myanmar. Although infrastructure is underdeveloped, the country is rich in water resources, tropical forests and minerals. A large majority of the population relies for its livelihood on agriculture, which accounts for over half of GDP. Urbanization is relatively low at 25 percent. Gross national income (GNI) per capita stands at around US\$340 in 2004. Reliance on external support to the budget remains high, and donor- funded programs account for nearly 40 percent of total public expenditures.

Lao PDR has maintained a single-party system, similar to China and Vietnam. The Lao PDR People's Revolutionary Party (LPRP) is headed by the Party's Central Committee comprising 53 members elected at the Seventh Party Congress in 2001. The structure of political power has remained unchanged since 1975. The National Assembly, whose members are elected directly by the people from a list of Party candidates, as well as any independent candidates, is increasingly playing a stronger oversight role. In the provinces, governments have a high degree of autonomy over resources, expenditures, and services.

Lao PDR has undertaken significant economic reforms to move from a command economy towards a market economy. When Lao PDR was established in 1975, a policy of "accelerated socialization" was pursued, including extensive agricultural collectivization. However, by 1982, the use of "market forces" was promoted at the Third Congress of the LPRP and, though halting at times, there has been progress towards this goal. In 1986, the Government officially abandoned the central planning system and introduced the New Economic Mechanism. Important steps were taken, such as near total price liberalization and exchange rate unification, the removal of the Government's trade monopoly, and the opening up of foreign and inter- provincial trade. Private firms were allowed to enter the market and family farms were encouraged over collectives. The private sector began to emerge and the number of state-owned enterprises (SOEs) was reduced by 75 percent. In 1991, the loss of official development assistance (ODA) following the collapse of the Soviet Union stimulated a re-orientation towards Asian and western markets.

Annual average real GDP growth rate was 6.3 percent between 1991 and 2000, despite the slow pace of reform and the Asian crisis. This compares favorably with the growth rates of China, Vietnam and other East Asian countries during this period. Real GDP growth averaged a slightly lower but still a robust rate of 5.6 percent a year between 2001 and 2004. Private investment, especially foreign investment, showed a persistent increase over these five years, albeit from a very low level, but growing to nearly 10 percent of GDP in 2004. While there were investments in tourism and garments, most of this increase in 2003 and 2004 came from foreign investment in the mining sector, especially in copper and gold. Inflation averaged 11 percent a year during the 2001-2004 period compared to an average of nearly 70 percent a year during 1997-2000. Inflation reached single digits (i.e., 8.6 percent) in December 2004.

According to the World Bank, progress in achieving Lao PDR's revenue potential will be slow due to inadequate technical capacity of revenue administration and a highly decentralized revenue administration in which provinces currently have weak incentives to collect and remit revenue to the national budget. In early 2004, the Government took several corrective measures: re-establishing

central control over seven main international checkpoints with revenue collected deposited into central government accounts; increasing control over major provincial large tax-payers units, modifying regulations to provide greater control by the center over granting of tax exemptions to investors; and frequent monitoring of provincial revenue collection and remittance to the national budget.

On a broader regional and global level, Lao PDR has been integrating gradually into the world economy since the 90s; it joined the ASEAN and the AFTA in July 1997; signed a bilateral trade agreement with the United States in 2003, which require the Government to open up services over time; was granted Normal Trade Relations (NTR) status by the United States in November 2004; and has applied for World Trade Organization (WTO) accession; Foreign direct investment (FDI) trends are significant relative to the size of the economy, although there are year-to-year fluctuations in flows, depending on the timing of large hydropower or mining projects.

Lao power sector

Lao PDR has significant hydropower resources but no confirmed oil or gas resources. Technical hydropower potential is estimated at 26,500 MW, but only a small fraction has been developed, providing substantial exports and 97 percent of the country's generation needs. In 2003, electricity exports accounted for about 30% of total export earnings. Most hydro energy is exported to Thailand while imports from Thailand provide energy in grids with no generation capacity and cover peak hour and dry season shortages in other grids. EDL hydropower stations can currently generate on average about 1,514 GWh annually. They are complemented by two independent power producers (IPP, namely Theun-Hinboun and Houay Ho) which produce an additional 1,600 GWh annually for export. As national power demand (250 MW, 906 GWh in 2003) grows at a 12 percent rate, EDL's net exports will progressively reduce over the coming years.

Laos and Thailand have a long history of bilateral electricity trade. Thailand began importing hydropower from Laos in 1971 and for many years Laos has been relying on medium voltage electricity from Thailand to supply its border provinces. Based on a common understanding since 1993, both governments have developed hydro power plants in Laos for the supply of electricity to Thailand, including the Theun-Hinboun and the Houay Ho hydro plants, which already use the Nam Theun river.

The state electricity operator Electricité du Laos (EdL) EdL was corporatized in 1997 and remains wholly-owned by the government. While commercialization of EDL has been underway since 1987, and major impetus was given to this process with its incorporation in 1997, there is a still strong interrelationship between government and EDL finances. In particular, there is confusion among the Government's various roles as: owner of EDL, regulator of EDL, on-lender of loans received by GOL, tax collector and electricity consumer (in relation to which EDL carries large receivables from government agencies). Thus, there is frequent resort to offsetting to enable EDL to meet financial covenants with its lenders.

In the wake of the regional financial crisis, EDL's financial situation deteriorated to a point where it became technically bankrupt. With the assistance of IDA and ADB, a financial restructuring plan was put into place. EDL's current financial situation is satisfactory. A comprehensive tariff study carried out in 2004 concluded that, while current tariff levels, if maintained in real terms, are adequate to allow EDL to meet financial covenants, EDL currently receives a subsidy of about 17 percent of the cost of its domestic operations, primarily through net export revenues from its own plants and IPP dividends.

EDL has been appointed as the Lao nominee shareholder for the two existing IPP projects. These dividends represent significant amounts of EDL's non-operating income. The government would like these dividends to come under the overall country revenue management policy and not under the corporate finances of EDL. The government has established the Lao Holding State Enterprise (LHSE), a special purpose company, that would receive and manage NT2 revenues. This option would provide a clear separation of NT2 dividends from EDL's accounts.

Thai Power Sector

Demand and supply conditions in Thailand are of particular importance as the country now has surplus generating capacity, because of the economic downturn in the late 1990s and the large amount of capacity that was then under development and could not be stopped on reasonable terms. In 2004 peak load was 19325 MW. Adding a 15 percent margin relative to peak load for reserves (EGAT's generation reliability requirement), the installed capacity requirement was about 22,224 MW; however installed capacity was 25,705MW, resulting in an excess of 3480 MW, or 15.7 percent of peak load plus required reserve. According to the Project Economic Analysis of the World Bank, on the basis of the demand forecast, excluding new plant from end-2003, the capacity surplus will be consumed by 2006. By 2009, Thailand will need approximately 5,900 MW new capacity. By the time of NT2 COD, the project will supply about one-half year of energy demand growth. NT2 would provide about 6 percent of the incremental energy requirement over 2009 to 2016

The distribution of power demand and generating capacity across Thailand indicate that, apart from metropolitan Bangkok, the North East region is the only part with a deficit in generating capacity. Exports from the Nam Ngum, Nam Theun and Xe Kong hydro projects in Lao PDR are strategically located to meet this deficit.

.EGAT, the state enterprise which is the primary electricity generator, was established by the Electricity Generating Authority of Thailand Act (1967) and, until 1992, had a monopoly on electricity generation in Thailand. The EGAT Act was amended in 1992 to allow some forms of privatisation by way of establishing limited companies and entering into joint ventures with private power companies. EGAT is the exclusive power purchaser. The MEA and PEA are the state enterprises responsible for electricity distribution.

In 1994, EGAT established a subsidiary, EGCO, which was later converted to a public limited company and made a public offering reducing EGAT's shareholding to 49%. EGCO's establishment as the first independent power producer in Thailand was undertaken with the aim to acquire some of the assets of EGAT and to supply generating capacity and electrical energy to EGAT under long-term power purchase agreements. In addition, as a second line of business, EGCO has sought out possible investment opportunities and developments in both Thailand and neighbouring countries.

Plans for the introduction of a competitive power pool, which would have introduced wholesale and retail competition over the next three to four years, have been scrapped. This was largely due to opposition from utilities to break up their domains, opposition from unions (currently a serious issue in corporatization) and uncertainties about the complexity of pool operations. The Government has decided to adopt the so-called Enhanced Single Buyer Model for the ESI which provides for: (i) EGAT continuing to be a sole buyer, dispatcher and bulk transporter of electricity; and (ii) EGAT, MEA and PEA introducing "accounting separation" for each of their business units. EGAT, MEA and PEA would be corporatized as a whole and listed on the stock exchange.

The project

The potential for hydroelectric power projects on the Nam Theun was first identified in the mid-1970s and was the subject of detailed studies during the following decades. It was not until the early 90s that the Nam Theun 2 hydroelectric project (“NT2” or the “Project”) was specifically recognized by the Government of the Lao PDR as a key project for the economic and social development of the Lao nation. With the introduction in 1994 of sponsors EDF of France and ITD of Thailand and the invitation to the World Bank and ADB to participate in the project, NT2 moved from a concept to a development phase. Its design and preparation of a complete set of economical, environmental and social safeguards have taken more than ten years. A temporary delay caused by the Asian crisis allowed the sponsors (which by 2000 also included EGCO of Thailand) to revisit a number of aspects of the Project, and to develop a structure more suited to the appetite of commercial lenders. This finally led to the successful US\$1.5 billion Project financing and subsequent beginning of full construction activities in June 2005.

The project includes the development, construction, and operation of a 1,070 MW transbasin diversion power plant on the Nam Theun, a tributary of the Mekong. The project site is in the central provinces of Khammuane and Bolikhamxay, about 250 kilometers southeast of Vientiane, and stretches from the top of the annamite mountain chain along the Lao PDR–Viet Nam border, to the Nakai Plateau, and ultimately to the confluence of the lower Xe Bang Fai with the Mekong . It will capture the flow of water from the watershed of the Nam Theun and the Nakai Plateau by building a dam 39 meters (m) high at the northwestern end of the plateau. The Project will create a reservoir of 450 square kilometers (km²) on the Nakai Plateau. Water from the reservoir will drop about 350 meters to a powerhouse at the base of the Nakai escarpment near the town of Gnommalat. The water discharged from the powerhouse will then flow through a 27 km channel to the Xe Bang Fai, which drains into the Mekong approximately 150 km south of the Nam Theun confluence. A regulating pond will be constructed downstream of the powerhouse to ensure smooth release of water into the downstream water courses.

The Project will construct a 138 km double circuit 500 kV transmission line to the Thai grid, and a 70 km single circuit 115 kV transmission line and 22 kV connections to the regional Lao grid. Approximately 5,354 GWh of power will be provided to Thailand annually and about 200–300 GWh of power will be transmitted for domestic consumption.

Project company

The NT2 hydropower component will be implemented by Nam Theun 2 Power Company Limited (NTPC), which was established on August 27, 2002, as a limited liability company incorporated under Lao PDR law. Its registered office is in Vientiane, Lao PDR. The purpose of NTPC is to develop, finance, build and then operate the Nam Theun 2 hydroelectric project. NTPC is owned by EDF International (EDFI) – a wholly owned subsidiary of Electricité de France (EDF), the Lao Holding State Entreprise (LHSE) - a company wholly owned by the Government of the Lao PDR, Electricity Generating Public Company (EGCO) of Thailand, and Italian-Thai Development Public Company (ITD) of Thailand.

The respective shareholdings are:

- 35% EDF International (EDFI)
- 25% Electricity Generating Public Company Limited (EGCO)
- 25% Lao Holding State Enterprise (LHSE)

– 15% Italian-Thai Development Public Company Limited (ITD)

Electricité de France and EDF International (EDFI) is the Head Contractor and Technical Services and Personnel Management provider. EDF is a public law entity owned by the French Government. The EDF group ranks as one of the largest enterprises in France and is one of the largest electric utility entities in the world with a total generating capacity of 101,255 MW including 20,655 MW of hydroelectric capacity. Outside of France, EDF, through EDFI, has shareholdings in approximately 44,828 MW of additional generating capacity (including plants under construction). EDF has participated in the construction of more than 600 hydroelectric schemes in France and elsewhere through the provision of hydroelectric and hydraulic expertise. Centre d'Ingénierie Hydroélectrique (CIH), the responsible division within EDF, is a world leader in undertaking hydroelectric related work, including the design, construction and commissioning of projects.

Lao Holding State Enterprise (LHSE), is a special purpose company set up to hold the government equity in NTPC. It was set up to improve the transparency of the Government's investments in the Project and prevent the cross-subsidization of EdL, The Ministry of Finance will own 100% of LHSE's shares. LHSE will be entitled to a 25% share of the total dividends declared by NTPC. The total dividends, minus the expenses of the LHSE and debt service payments, will be transferred to a dedicated treasury account of the Ministry of Finance, which is being established under the agreed-on revenue management arrangements.

Electricity Generating Public Company Limited (EGCO) is the Technical Services and Personnel Management provider, acting through its subsidiary ESCO. EGCO is among the largest publicly listed energy companies in Thailand. It is a leading operator of independent generating capacity within Thailand with over 2,000 MW of generating capacity.

Italian-Thai Development Public Company Limited (ITD) is the Principal Sub-Contractor under the Head Construction Contract. ITD is the largest publicly listed infrastructure construction company in Thailand. ITD has constructed seven major dams since 1970, including the Khao Laem Dam and hydroelectric project at Kanchanaburi which included a 1,000 m long, 127 m high concrete faced rock-fill dam.

Agreements

The Concession Agreement (the "CA") signed between NTPC and the Government of Lao PDR ("GOL") is the basis on which the Government granted NTPC a concession to develop, own, finance, construct, and operate the hydroelectric plant and related facilities, and to transfer the project to GOL at the end of the concession period. The CA is for a period of 25 years from the Commercial Operations Date. Through the Concession Agreement, NTPC has the right of using the water stored in the reservoir, subject to certain limitations and release obligations as stated in the Agreement. The Concession Agreement therefore makes NTPC responsible for the whole water management aspects and associated release obligations and restrictions.

Under the proposed financial and contractual structure, the project's electrical energy will be sold under two long-term "take-or-pay" Power Purchase Agreements (PPA), - the EGAT PPA and a PPA with Electricité du Laos ("EDL").

The EGAT Power Purchase Agreement ("EGAT PPA") was signed between NTPC and EGAT on November 8, 2003. It is the key contract for the project under which NTPC shall make available to

EGAT generating capacity of up to 995 MW and electrical energy of 5,636 GWh per year to be purchased at agreed tariffs on a take-or-pay basis. The EGAT PPA is for a period of 25 years from the Commercial Operations Date (COD) and includes provisions detailing the rights and obligations of both EGAT and NTPC, including the performance obligations of EGAT and NTPC, EGAT and NTPC Events of Default, Force Majeure Events and Termination. NTPC shall provide various securities (the Initial Development Security, the Additional Development Security, the Supplemental Security, the Performance Security; and the Additional Security) to EGAT to secure, in whole or in part, NTPC's obligations under the EGAT PPA.

The EGAT PPA does not pass to EGAT the water management and hydrological risks which fully remain NTPC's risk and responsibility. On the basis of an appropriate combination of project design parameters and commercial mechanisms in the EGAT PPA, the hydrological risk is significantly smoothed. Although the annual inflows vary in the range 50% to 160% of the average inflows over the reference period:

- the total PE+SE generation is kept within a 72% - 120% band
- the PE generation is kept within a 85% -102% range and
- the revenue is kept within a very narrow range: 90% to 110% of the annual average revenue. In extremely dry years of the simulation period, the relative revenue does not fall below 86% of the average annual revenue.

Some of the relevant terms of the PPA are provided in **Exhibit 1** .

The EDL Power Purchase Agreement (or "EDL PPA") was signed between NTPC and EDL on November 8, 2003. It defines the obligation of NTPC to make available generating capacity of up to 75 MW and electrical energy of 200 GWh per year to EDL to be purchased at an agreed tariff on a take-or-pay basis for a period of 25 years from the date of Commercial Operations.

The Government of Lao (GOL) Undertaking between GOL and EGAT identifies and establishes the parameters and framework that are required by all parties to effect a smooth transition of the project and the Project Agreements following a Company default or prolonged Lao PDR Political Force Majeure under either the Concession Agreement and or the EGAT PPA. As a part of the Undertaking, the GOL recognizes that EGAT has certain rights under the EGAT PPA to step-in and/or purchase the project, and that EGAT is able to enforce its security rights against GOL under the EGAT PPA.

The Head Construction Contract. NTPC will enter into the Head Construction Contract (HCC) with EDF (the "Head Contractor" or "HC"). NTPC will undertake the construction of the project through a HCC which is a turnkey, price-capped engineering, procurement and construction contract between NTPC and the HC. The HC in turn will subcontract the construction works under five principal subcontracts: the Civil Works 1 ("CW1"), Civil Works 2 ("CW2"), Civil Works ("CW3"), Electromechanical 1 ("EMI") and Electromechanical 2 ("EM2") packages.

As head contractor, EDF will have full responsibility for overall project management and delivery of the completed project for a fixed price and by a specific date. Subcontractors will work under its direction on fixed-price, time-certain, lump sum contracts; the only exception being the underground works which are part of civil works contracts (CW2 and CW3), estimated to amount to about US\$20 million of a total HCC cost currently estimated at about US\$722 million. The other three subcontracts place the construction risk fully on the subcontractor.

The Technical Services and Personnel Management Contracts include the operating and maintenance arrangements for the project. NTPC plans to undertake the operation of the project itself, but with the provision of technical support and staffing from EDF and EGCO (acting through its subsidiary ESCO). Technical Services and Personnel Management Contracts are being entered into by NTPC,

with Electricite de France (EDF) and EGCO Engineering & Service Co., Ltd. (ESCO), an operational subsidiary of EGCO. These have been developed to ensure that a comprehensive operational structure can be implemented that will meet all of the operational obligations of NTPC under the CA, EGAT PPA and the EDLPPA.

The Sponsors' Agreement was signed on 3 October 2002 between EDFI, EGCO, ITD and the GOL. It sets out the rights and obligations of EDFI, EGCO and ITD in respect of the development of the project before the Construction Phase Commencement Date.

The Shareholders' Agreement ("SA") was signed on 19 September 2001 between EDFI, EDL, EGCO, and ITD and was acceded to by NTPC following its incorporation in September 2002. The SA sets out the rights and obligations of the shareholders, provides for the objectives, establishment, management and operation of NTPC, and agrees on the Articles of Association of NTPC. The SA has a duration of 45 years from signing.

GOL Implementation Arrangements. The CA specifies the division of labor between GOL and NTPC for the construction and operation phases of the project. In order to coordinate the involvement of several ministries, agencies, and provinces involved in the project, the GOL has established a steering committee, chaired by the Minister of Industry and Handicrafts (MIH), that reports to the Deputy Prime Minister.

NTPC Implementation Arrangements. To fulfill its environmental and social obligations under the CA and implement the actions specified in the SDP and EAMP, NTPC has established an Environment and Social Management Division. The work of the division will be undertaken by two offices -Environmental Management Office and the Resettlement Office.

Project Cost and Financing

The total base cost of the Project is estimated at \$1,250 million equivalent, comprising \$795.7 million (63.6%) in foreign exchange cost and \$454.3 million (36.4%) in local currency costs. The cost estimates have been prepared using 2005 price levels. Details of project costs are given in **Exhibit 2** and a summary is given below.

Summary of Project Base Cost Estimates (\$ million)

Item	Foreign Exchange	Local Currency	Total
A. Construction Cost	396.2	315.3	711.5
B. Environmental/Social Mitigation	48.8	0.0	48.8
C. Development Cost a	150.6	14.0	164.6
D. Financing Cost b	173.0	106.3	279.3
E. Base Contingencies	27.1	18.7	45.8
Total Base Cost	795.7	454.3	1,250.0
Total contingent costs	116.6	83.4	200
Total	912.3	537.7	1,450.0

a Pre-operating, compensation to the Government of the Lao People's Democratic Republic, Nam Theun 2 Power Company Limited (NTPC) administration, works and project preparation.

b Financing costs also include upfront and commitment fees, charges related to political risk guarantees extended by the Asian Development Bank, International Development Association, and Multilateral Investment Guarantee Agency, and risk premium on export credit agency facilities.

Source: NTPC estimates.

Financing Plan

International commercial banks were unwilling to lend to the project without the availability of adequate political risk mitigation, both in Lao PDR and in Thailand. Consequently, GOL and NTPC have requested IDA, ADB and MIGA to provide risk mitigation instruments to support the international lending package for NTPC. According to the World Bank, for a project the size of NT2 located in Lao PDR, support through the use of multilateral guarantees offers the only practical solution. This would enable the International Financial Institutions and bilateral agencies to use a limited amount of public resources to mobilize over US\$1,200 million in limited recourse private funding through shareholders' equity and long-term private commercial bank debt.

The base project cost is being funded 28 percent by equity (US\$350 million) and 72 percent by debt (US\$900 million). The additional US\$200 million of contingent costs are being financed 50 percent by equity and 50 percent by debt, on a *pari passu* basis. Debt and equity are denominated in a mix of dollars and baht to match the composition of the two currencies in project base costs. The 50/50 mix of US dollar and baht debt is designed to match the tariff paid by EGAT and EdL. This will reduce the currency mismatch between the revenues received by NTPC and the amounts paid to the lenders. Details of project financing are provided in **Exhibit 3**.

Project Capital Structure

	US dollar	THB	Total	%
	(\$ million)	(\$ million equivalent)	(\$ million)	
Equity	345.2	4.8	350.0	28.0%
Debt	450.0	450.0	900.0	72.0%
Total	795.2	454.8	1,250.0	100.0%
%	63.6%	36.4%	100.0%	

The transaction is structured as a limited recourse financing and the allocation of risks follows the traditional private project financing approach where the completion risk ultimately rests with the private project company and/or its contractors. The project structure allocates this risk to various parties responsible for specific project activities.

The US\$ senior debt facilities includes political risk guarantees from the Asian Development Bank (ADB), the World Bank and the Multilateral Investment Guarantee Agency (MIGA), export credit agency support from COFACE of France, EKN of Sweden and GIEK of Norway, and direct loans from a number of multilateral and bilateral development agencies including the ADB, Nordic Investment Bank, Agence Française de Développement (AFD), PROPARCO and Export-Import Bank of Thailand.

Nine international commercial banks (ANZ, BNP Paribas, BOTM, Calyon, Fortis Bank, ING, KBC, SG and Standard Chartered) and seven Thai commercial banks (Bangkok Bank, Bank of Ayudhya, KASIKORNBANK, Krung Thai Bank, Siam City Bank, Siam Commercial Bank and Thai Military Bank) are providing long term loans to NTPC.

Proposed Government Equity Financing Structure

The US dollar and baht base project equity contributions amounting to \$350 million will be shared pro rata by NTPC's four shareholders. As the Government holds 25% equity share of NTPC, its base equity injections will amount to \$87.5 million (excluding contingent equity). The Government's equity injection will be financed by loans, credits, and grants from ADB's OCR (loan up to \$20.0 million including interest during construction and contingent fees), the International Development Association (IDA) (grant up to \$20.0 million), the European Investment Bank (loan up to €40.0 million or equivalent to \$52.0 million), the Agence Française de Développement (grant funds of €5.0 million or \$6.5 million). NTPC is required to compensate the Government \$30.0 million for its loss of biodiversity and/or ecotourism assets and in payment of its development costs, as set out in the concession agreement (the Government contribution). A portion of this amount will be used to fund base equity, and the remainder will be reserved for contingent equity calls on Government.

Political Risk Guarantees

IDA Guarantee. The IDA Partial Risk Guarantee (PRG) would back any debt service default resulting from activities and actions under GOL's control: expropriation; the issuance and renewal of permits for construction and operation; changes in laws, taxes and duties; other specific obligations of a sovereign nature defined in the CA and other related agreements and deemed critical for obtaining

finance; and natural force majeure events that are beyond the control of NTPC and that cannot be insured in the public or private insurance market. The PRG would only cover Lao sovereign risks as defined in the Project Agreements, and will not cover any Thai sovereign risks (even though the project sells electricity to the Thai utility EGAT and is subject to the offtake risk arising out of the EGAT PPA).

It is proposed to charge NTPC a fee of 2.00 percent per annum, of which IDA would be paid 0.75 percent per annum and GOL would be credited the remaining 1.25 percent per annum as long as there is no debt service default on account of non-fulfillment of GOL obligations.

MIGA Guarantee and Insurance. MIGA proposes to offer political risk guarantees to international dollar lenders to the project, covering their non-shareholder loans, including interest and interest rate hedging instruments, to NTPC. MIGA proposes to mitigate the risks of expropriation, breach of contract, transfer restriction and war and civil disturbance in Lao PDR. In Thailand, MIGA will cover initially the risks of breach of contract, transfer restriction and war and civil disturbance. If the off-taker, EGAT, is privatized MIGA intends to cancel the breach of contract coverage and replace it with the expropriation cover. Coverage will be for a period up to 20 years in both Thailand and Lao PDR. MIGA further proposes to offer EDF, a company incorporated under the laws of France, guarantees covering a small portion of its equity investment in the project against the risk of transfer restrictions in Lao PDR for up to 20 years. MIGA will guarantee up to 97.5 percent of the non-shareholder loans and up to 90 percent of the equity. These coverages will translate into a gross exposure of up to US\$200 million for the project. After reinsurance, MIGA's net exposure under this project would be up to US \$100 million.

Financial projections and evaluation²

A financial analysis of the Project and the Government of Lao PDR equity investment has been carried out over the Project's economic useful life, which includes the Project construction period (May 2005–November 2009) and the 25-year operating period (November 2009–November 2034).

The financial projections are based on those generated by a financial model that was prepared for NTPC by its financial advisors. The model is intended to illustrate the financial performance of the company over the entire operating period of the concession under a base case scenario. This base case reflects what the project sponsors and its financial advisors deem to be a most likely set of outcomes regarding the financial position and performance of NTPC.

The key assumptions employed in the financial evaluation are described below.

Price Basis & Exchange Rates.

All costs and revenues are expressed in US dollars at current prices using the Manufacturing Unit Value Index (MUV).³ The most recent MUV projections issued in July 2004, which provide projected

² This is based on the analysis in the ADB document, "Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Lao People's Democratic Republic for the Greater Mekong Subregion: Nam Theun 2 Hydroelectric Project March 2005

³ MUV Unit value index (in U.S. dollars) of manufactures exported by 20 developed countries, with country weights based on the countries' total 1990 exports of manufactures (that is, 1990 = 100).

values over the 2004–2015 period, have been employed. Beyond 2015, the annual increase in MUV is assumed to be 1.0%.

Projected Annual Change in Manufacturing Unit Value (MUV) index (%)

2004	2005	2006	2007	2008	2009–2015	2016–2034
6.0	-1.6	0.0	0.8	0.8	0.6	1.0

Project costs and revenues will be incurred and received in a mix of US dollars and Thai Baht (THB). In order to convert THB amounts to their US dollar equivalent, a fixed exchange rate of THB40/\$1.00 has been employed in the base case because long-term technical services agreement with Operating and Maintenance (O&M) operators will be signed in which foreign exchange rate exposure will be mitigated.

The financial evaluation of the Project was undertaken in real terms using constant 2005 prices. The project cost estimates and financial projections in nominal terms were converted to real terms by adjusting for the projected effects of foreign and domestic inflation and currency fluctuation.

Operating Revenues

Operating revenues consist entirely of that derived from the sale of electricity under the PPAs. Annual operating revenues are projected as electricity sales in each tariff group multiplied by the applicable tariff in each year over the term of the Concession Agreement (CA). With the tariffs having both a US dollar and THB component, given projected electricity sales, just over 51% of annual operating revenue will be generated in US dollar, with the remaining 49% being in THB. This provides a revenue stream in the two currencies that closely corresponds to estimated US dollar and THB denominated debt service. This hedges the NTPC currency exposure.

Electricity sales are taken as the minimum guaranteed generating capacity to be made available to the Electricity Generating Authority of Thailand (EGAT) and Electricité du Lao (EdL) as provided for under their respective Power Purchase Agreements (PPA) over the commercial operating period beginning in November 2009.

Annual Electricity Sales (GWh)

	2009	2010	2011	2012	2013–2034
EGAT	808	5,438	5,354	5,354	5,354
EdL	24	165	178	192	200
Total	833	5,603	5,532	5,546	5,554

EdL = Electricité du Lao, EGAT = Electricity Generating Authority of Thailand, GWh = gigawatt-hour.
Source: Nam Theun 2 Power Company.

Electricity tariffs are fixed by the PPAs for each year over the agreement period. Under the EGAT PPA, separate tariffs have been established for each category of energy: (i) Primary Energy (PE), (ii) Secondary Energy 1 (SE1), and Secondary Energy 2 (SE2). The initial PE tariff is set at \$0.02118 plus THB0.805 per kilowatt-hour (kWh) in 2009. With an annual increase that averages about 1.4%,

the PE tariff in the final year of the concession (2034) will be \$0.02948 plus THB1.120 per kWh. For SE1 energy, the initial tariff is \$0.00975 plus THB0.370 per kWh and increases at the same annual rate as for PE so that by 2034, the tariff reaches \$0.01358 plus THB0.516 per kWh. SE2 energy is priced at THB 0.570/kWh for all years over the concession period.

The tariffs applicable to sales to EdL are lower than those for EGAT. All power sold to EdL is PE and initial tariff is \$0.01765 plus THB0.698 per kWh. With annual increases of 1.4%, the same as that applying to EGAT, the EdL tariff in the final year of the concession, 2034, is \$0.02457 plus THB0.961 per kWh.

Capital expenditure

For the purposes of the financial analysis, the capital expenditure or project cost includes only those costs incurred directly by NTPC. Therefore, the costs to EGAT associated with the construction of the transmission line and associated facilities in Thailand are excluded. Capital expenditures are limited to the construction of the project facilities over the 2005–2009 period. After the commencement of operations in 2009, no further capital expenditures would be made over the life of the CA. The total capital cost of the project is estimated to be \$1,250.0 million. Of this total, development costs are estimated to be \$74.2 million. Under the Shareholders Agreement, these development costs are reimbursable to shareholders subject to confirmation by an independent financial audit. Lenders have stipulated these amounts will be converted into base equity rather than reimbursed.

Costs

Operating & Maintenance (O&M) Expenses are those directly incurred by NTPC over the 25-year operational period of the concession. NTPC has projected these costs on an annual basis according to six expense line items: (i) environmental and social costs, (ii) NTPC administration costs, (iii) NTPC operator fee, (iv) owner direct cost, (v) insurance, and, (vi) major maintenance. Major maintenance is intended primarily to cover the cost of two overhauls of each turbine. Over the concession, the total cost of major maintenance is estimated at \$50 million, expressed in constant prices. Excluding major maintenance, average annual O&M expense is estimated at \$13.7 million, also expressed in constant prices. O&M costs have been estimated separately in US dollar and THB in constant prices and converted to a current price basis using projected US and Thai consumer price index.

Both a royalty and income tax are applied by the Government of Lao PDR on revenues and profits earned by NTPC. However, under the terms of the CA, these are applied at reduced rates over the initial period of the concession. NTPC is exempt from income tax over the 2009–2014 period and then pays the following the rates over the remainder of the concession; 5.0% between 2015 and 2021, 15.0% between 2022 and 2027, and 30.0% between 2028 and 2034. The royalty is applied at 5.2% between 2009 and 2024, 15.0% between 2025 and 2029, and 30.0% over the remainder of the concession. The royalty and tax rates to be applied in each year have been designed specifically for the project on the basis of NTPC's debt repayment schedule. For example, the increase in the income tax rate from 5.0% to 15.0% is not implemented until immediately after all NTPC debt is repaid at the end of 2021.

Depreciation expense is calculated on the basis of total capital cost on a straight-line basis over the 25-year operating period of the concession. On this basis, annual depreciation expense is \$49.5 million.

Working capital and reserves

Accounts receivable consist entirely of the tariffs billed to EGAT and EdL that have not yet been paid to NTPC. This is assumed to be equivalent to one month of projected billing in each year over the concession period.

Accounts payable consist of that portion of operating and maintenance expenses incurred, but not yet paid by NTPC. This is also assumed to be equivalent to one month of such expenses.

In order to ensure that NTPC will be able to meet all debt service obligations, a Debt Service Reserve Account (DSRA) is to be established and funded from net cash flows, after all operating and debt service obligations for the current period have been met, and before dividend payments to shareholders. The amount held in the DSRA is to be equal to total debt service obligations due over the upcoming six-month period.

A Major Maintenance Reserve Account (MORA) is to be established to ensure that NTPC is able to cover the costs of the two planned overhaul cycles discussed earlier. The MORA is funded from net cash flows after contributions to the DSRA have been met and before dividend payments. Allocations to the fund begin the second full year of project operations, 2011, and are estimated to be about \$1.6 million per year over the period to 2020. This would provide the funds required for the first year of the first overhaul cycle beginning in 2020. After that, the amount required for each year would be allocated in the preceding 12-month period.

Dividends

After all obligations relating to operational expenses, debt service, royalty and taxes, working capital, and DSRA/MORA allocations have been met, and subject a minimum debt service coverage ratio to be agreed with the lenders, any remaining cash is paid out as dividends. Under the base case projections, dividends begin in the second half of 2010 and continue through the remainder of the concession. NTPC's dividend policy is set out in the Shareholders Agreement (Clause 19) and reflected in identical wording in the company's Articles of Association. This states that dividends are to be paid every six months and consistent with the policy of maximizing such dividends subject to: (i) payment of all sums due under the project transaction documents (shareholders agreement, concession agreement, EdL/EGAT power purchase agreements, EGAT security documents, financing documents, head construction contract, preliminary construction works contracts, insurance policies, operation and maintenance agreements, project base case, project coordination agreements); (ii) adequate reserves for working capital or other purposes as deemed appropriate by shareholders; and (iii) the provisions of the financing documents.

Financing and Cost of capital

The capital cost of the project is financed by a combination of debt (72%) and equity (28%). NTPC shareholders make equity injections totaling \$350.0 million over the 2005–2009 project construction period. That portion of the project cost not covered by equity, presently estimated at \$900.0 million, is financed by long-term debt. Equity and debt is denominated in a mix of US dollar and THB to match the composition of the two currencies in project capital costs. The overall capital structure is 63.6% US dollar and 36.4% THB, exactly matching the mix of US dollar and THB capital expenditures required for project construction.

Cost of debt

The existing debt financing plan is summarized in **Exhibit 4**. The interest rates shown have been employed in the base case financial projections. However, they are indicative; the base rate would not be set until financial close, and the lending margins have not yet been finalized with lenders. Based on existing interest rate and credit conditions, these assumed borrowing rates appear to be slightly high. However, the NTPC assumptions regarding its longer term borrowing costs reflect the fact that current interest rates in both the US and Thailand are low by historic standards. Therefore, the interest rates employed in the financial projections reflect the expectation that rates will move higher. The interest rate assumptions may also reflect a relatively conservative approach taken by NTPC and its financial advisors in estimating borrowing rates.

As discussed above, NTPC's equity and debt structure has been specifically designed to hedge the company's exposure to changes in US dollar and THB exchange rates. Under its existing financing plan, the company would also hedge its interest rate exposure on US dollar debt by swapping its floating rate loans to a fixed rate. However, the plan presented in the base case financial model does not presently incorporate any interest rate hedging on THB debt. The size and liquidity of the THB interest rate swap market is much more limited than that for US dollar swaps. This significantly limits the maturities available and means that costs are higher than that for US dollar interest rate swaps.

The cost of debt is estimated to be 9.5% in nominal after-tax terms, which is equivalent to a real after-tax rate of 8.8%. The cost of debt is estimated as the internal rate of return calculated from projected cash inflows and outflows on all NTPC debt. Cash inflows are the projected drawdown on each planned loan to NTPC. Cash outflows include principal repayment, interest expense, and all applicable upfront, commitment and guarantee fees. The terms of each loan have been derived from the NTPC borrowing plan, as incorporated into the financial model. This borrowing plan is based on somewhat conservative assumptions regarding the terms of each loan and, therefore, may slightly overestimate the overall cost of debt. However, even if less conservative assumptions are employed, the cost of debt to NTPC would remain relatively high for a number of reasons. First, the non-recourse financing structure employed for the project increases borrowing costs, not only through higher interest rates, but also through the need for loan guarantees. The upfront and commitment fees on the various loans also increase overall borrowing costs.

Other Financing Costs include upfront and commitment fees; charges related to political risk guarantees extended by ADB, the International Development Agency, and the Multilateral Investment Guarantee Agency; and risk premiums on export credit agency facilities.

Cost of equity

The cost of equity incorporated into the WACC has been estimated on the basis of the capital asset pricing model, which provides a methodology for estimating the required equity return as a function of the relative risk of the investment. The cost of equity is the rate of return on a risk-free investment, such as Government bonds, plus a risk premium appropriate for the project. Estimating both the risk-free rate and risk premium for NTPC is complicated by the lack of functioning debt and equity markets in the Lao PDR as well as the cross-border nature of the Project. With 94% of the electricity being exported, the cost of equity estimated for the Project needs to reflect the lower level of commercial risk associated with business operations in Thailand relative to the Lao PDR. On this basis, a weighted average risk-free rate of 7.4% has been estimated which incorporates the different individual rates applicable to the Lao PDR and Thailand.

The risk premium has been estimated on the basis of an analysis of standard risk indicators for 87 United States power utilities, 13 international power utilities and the two publicly listed independent

power producers in Thailand. Adjustments have then been made to reflect the additional market, tax and country risks of Lao. Based on this methodology, the risk premium is estimated to be 7.3%. Therefore, the estimated cost of equity is 14.7% in nominal terms, which after adjusting for inflation is equivalent to a real cost of equity of 13.6%.

The project financial statements are provided in **Exhibits 5-7**.

Project Financial Evaluation

The project cash flows in constant terms used for financial evaluation are provided in **Exhibit 8**. The WACC for the Project was calculated based on the weighted average of the estimated cost of equity and debt comprising the NTPC capital structure.

Item	Equity	Debt ^a	Total
Amount (\$ million)	350.0	900.0	1,250.0
Weighting (%)	28.0	72.0	100.0
After-Tax Nominal Rate (%)	14.7	9.5	
After-Tax Real Rate (%)	13.6	8.8	
Weighted Real WACC (%)	3.8	6.3	10.1

^a For dollar debt under base-case drawdown, average lending terms: 16.4-year term, 4.5- year grace period, 6.80% interest rate after swaps. For baht debt, average lending terms: 15.0-year term, 4.5-year grace period, 8.58% interest rate.

Under the same base-case scenario as in financial projections, the project FIRR is calculated as 12.4%. The Project's NPV is \$166.6 million at the WACC (or discount rate) of 10.1%.

Return on Investment to the Government of Lao PDR

The objective of this analysis is to assess the financial viability of the Project from the perspective of the Government, as a shareholder in NTPC as well as the authority that taxes NTPC revenues and profits. Cash outflows and inflows are limited to those directly incurred or received by Government. Cash outflows consist of the equity injections made by the Government into NTPC. Cash inflows to the Government consist of three components: (i) shareholder dividends paid by NTPC to the Government through LHSE; (ii) the royalty paid by NTPC on its operating revenues; and (iii) income tax paid by NTPC on its profits. Income to the Government that would be generated indirectly as a result the project, such as increased tax revenues resulting from project induced economic growth, is not considered in this financial analysis.

The Government receives royalties for each unit of energy sold by NTPC over the 2009–2034 project operating period. In addition to these royalties, the Government will also receive a \$30 million payment from NTPC as compensation for loss of biodiversity and ecotourism assets and for the project development cost. Some of this payment may be reserved to meet the Government's contingent equity obligations. This contingent obligation would arise if additional equity injections were required to cover any cost overruns during project construction. After any such obligations were met, the remaining balance would be paid to the Government after the contingent equity release date. In the base case scenario, an initial payment of \$4.2 million is paid in the first six months of construction to cover a small portion of base equity. An additional \$0.8 million has already been allocated to the Government expenses during project development. This leaves a remaining amount

of \$25 million to be paid to the Government at the commercial operation date (COD) in 2009. These payments are treated as a royalty payment for the purposes of the financial analysis.

The Government will apply income tax on profits earned by NTPC after the expiry of the income tax holiday at the end of 2014.

At the end of the concession in 2034, the project assets will be transferred by NTPC at no cost to the Government. Given that the economic life of the assets should extend well beyond 2034, the Government could then use the facility to generate power for consumption within Lao and/or for sale to Thailand. Therefore, the project should generate net cash flows to the Government beyond the end of the concession. This terminal value could be estimated as the NPV of these cash flows over the remaining operating life of the project. However, given that the use and value of the power over this post-concession period are uncertain, the terminal value is very conservatively assumed to be zero.

Expressed in nominal terms, total Government revenues from dividends, royalties and income tax receipts are projected to be \$1.9 billion over the life of the concession, almost 15 times greater than total debt service on the ADB and EIB loans used to finance the Government's shareholding in the Project. Therefore, the project will generate a very large cash surplus for the Government, estimated at \$1.8 billion, which provides a significant reserve margin against any potentially adverse events during the debt repayment period.

The cash flows for the Laos government in constant terms is provided in **Exhibit 9**

The WACC has been calculated on the basis of the proposed financing plan for the Government equity injection. The proposed IDA and AFD grants, as well as the NTPC contribution, have been valued at their opportunity cost, which is assumed to be the cost of the Government's equity in NTPC, estimated to be 13.6% in real terms. The cost of debt is calculated as 4.9% in nominal terms, equivalent to a real rate of 4.1%, which is based on the proposed terms of the ADB and EIB loans. Even if a conservative discount rate is utilized (i.e., the Project WACC of 10.1%), the NPV of these flows is estimated at \$167.4 million.

(%)			
Item	Equity	Debt	Total
Weighting	29.8	70.2	100.0
Nominal Rate	14.7	4.9	7.8
Real Rate	13.6	4.1	
Weighted Real WACC	4.0	2.9	6.9

Sensitivity Analysis

An analysis was undertaken to test the sensitivity of FIRR, WACC, and NPV to adverse changes in selected key variables. The variables tested were

- i) 6-month and 1-year delays in construction due to nonperformance of NTPC, which would increase project costs;
- ii) 6-month and 1-year delays in construction due to nonperformance of EGAT, which would have no impact on project costs;

- iii) decrease in power demand so that only primary energy is dispatched, which reduces NTPC revenues;
- iv) changes in the Thai Baht and US dollar exchange rate;
- v) a “worst case” hydrological scenario which includes a number of low generation (i.e., dry) years early in the project operating period;
- vi) a combination of the 1-year delay due to NTPC nonperformance and the decrease in power demand; and,
- vii) a combination of the 1-year delay due to NTPC nonperformance and the low hydrology case.

The analysis presented in **Exhibit 10** indicates that, of the single variable scenarios, project financial viability is most sensitive to construction delays caused by nonperformance by NTPC. This could result in unforeseen cost overruns and liquidated damages payable to EGAT. However, under all four delay scenarios, the Project remains financially viable. Project viability is relatively sensitive to a reduction in power demand, which case can serve as a proxy for a reduction in revenue (e.g., should the Project be integrated into a power pool in Thailand and market prices fall below the contracted tariff schedule). Even assuming only primary energy is sold, thus reducing demand by 17% and revenues by 9% compared to the base case, the Project remains viable. In fact, the Project can endure a 15.2% annual average reduction in revenue over the operating period and still be viable. Changes in the Thai Baht and US dollar exchange rate do not have a significant impact on project viability because currency exposure has been largely hedged by NTPC.

Exhibit 1

Nam Theun 2 Hydroelectric Project

The EGAT Power Purchase Agreement (Extracts from Summary for Public Disclosure)

6. MAIN COMMERCIAL MECHANISMS

6.3 Categories of Electrical Energy Components

The EGAT PPA divides electrical energy into three categories of Energy Components:

- Primary Energy (“PE”) that is declared available between 6 a.m. to 10 p.m. on any weekday (Monday to Saturday inclusive);
- Secondary Energy 1 (“SE1”) that is declared available at any other time; and
- Excess Energy (“SE2”), composed of the Monthly Base SE2 (up to 5% of the Final Total Availability) and the Monthly Dispatch Excess SE2.

The categorisations of PE and SE1 are not linked to the period of generation but only to the declaration and availability. The metering equipment does not distinguish between electrical energy generated during PE and SE periods.

The main differences between the different energy components are:

- the tariff applicable to each of them as well as the currency of payment, as shown in Table 1 below,
- the commitment to purchase that EGAT has for each of them.

Table 1 – Energy quantities, EGAT obligation to purchase, Tariff, Payment

Energy Component	Quantity GWh/year (1)	EGAT Obligation to Purchase	Applicable Tariff	Payment
Primary Energy (PE)	4406	100%	50% in USD, 50% in THB (2)	USD and THB respectively
Secondary Energy 1 (SE1)	948	100%	50% in USD, 50% in THB (2)	100 % THB (3)
Secondary Energy 2 (SE2)	282	0%	100 % THB Fixed over the Term	100 % THB
Total	5,636	95%		

(1): Long term Average Target

(2): assuming an exchange rate of USD 1: 38 THB – Tariff subject to escalation per 12 calendar months

(3): after conversion of USD portion in THB at prevailing exchange rate

6.5 General Concepts relating to Declaration, Dispatch, Spillage Accounting etc.

6.5.1 Declaration

NTPC makes periodic declarations to EGAT. Declarations contain information as to the energy availability which may be provided by NTPC, which is a function of the availability of both machine (generating units and Generator Transmission Facilities) and fuel, i.e. actual water/hydrological condition. Declarations serve two main functions:

1. to determine the amount of NTPC's revenues payable by EGAT; and
2. to determine the amount of liquidated damages payable by NTPC to EGAT.

6.5.2 Unavailability vs. Outage

Any unavailability reduces the revenues payable by EGAT, whilst any outage results in liquidated damages payable by NTPC.

6.5.3 Dispatch

EGAT has the flexibility to dispatch NTPC on a unit by unit basis as it requires, subject only to certain operational constraints.

6.8.2 Dispatch shortfall, Make-up

If EGAT dispatches less than the PE and SE1 comprised in the NTPC monthly availability, dispatch shortfall occurs. EGAT shall be entitled to make-up such dispatch shortfall in subsequent months by dispatching more than the final monthly availability for subsequent months without incurring any additional payment obligation, subject to spillage accounting.

Subject to spillage accounting, NTPC shall store in the reservoir the water corresponding to any dispatch shortfall and shall not include such water in its further monthly declarations.

6.5.5 Excess Energy Month

An Excess Energy Month is:

- any month in which there is spillage of water from the reservoir;
- August or September and the water level is above 537.5 m ASL on the last day of the preceding month; or
- as elected by NTPC.

There is increased risk of spillage during an Excess Energy Month.

6.8.3 Dispatch Excess and Payment

If EGAT's dispatch exceeds the sum of the Final PE Availability and the Final SE1 Availability, such excess, after deducting any make-up, constitutes **Dispatch Excess** energy.

In an Excess Energy Month, all Dispatch Excess energy will be allocated as SE2. In other months, the Dispatch Excess energy will be allocated into PE, SE1 and SE2 respectively, the SE2 portion being 5 %.

6.9 Allocation of spillage responsibility

The Dispatch flexibility available to EGAT associated with NTPC's obligation to store EGAT shortfall water/energy in the reservoir until it is further dispatched may increase the spillage. Without a clear allocation of spillage responsibility when the reservoir spills, it could happen that EGAT "owns" the whole reservoir, with no potential revenue for NTPC for the next hydrological year.

To avoid such occurrence two measures are implemented in the Agreement:

- a specific spillage accounting, to determine the volume of water and energy spilled for each

- spillage event,
- a threshold, the “Monthly Accountable Dispatch Shortfall Allowance” or allowance for spillage, which protects NTPC against a massive amount of EGAT shortfall water in the reservoir during the wet season (and acts as an incentive for EGAT to limit or clear the dispatch water in the reservoir before/during the wet season).

6.5.7 Dispatch Excess

This is the converse of dispatch shortfall. EGAT may dispatch more than all of NTPC’s declaration, subject to the limitations to be observed by EGAT in NTPC’s declarations. Such excess is first considered as make-up energy up to an amount equal to the accumulated Dispatch Shortfall energy and then as Dispatch Excess energy.

6.5.8 Annual Supply Target

This is the long term average supply by the Generator System based on forecast hydrological, design and operating constraints, at 4,406 GWh for PE and at 948 GWh for SE1.

6.12 Energy Accounting and Payment

At the end of each month, a monthly accounting is performed in order to determine the Final Declaration or Final Availability which is basically the Aggregate Declaration minus the unavailability not included in the Aggregate Declaration. Irrespective of the EGAT dispatch for that month the Final Declaration will be the basis for the EGAT payment for that month.

Depending if Dispatch Excess or Dispatch Shortfall occurs during that month, the payment by EGAT is shown in Figure 9 below.

Figure 9 – Payment principles

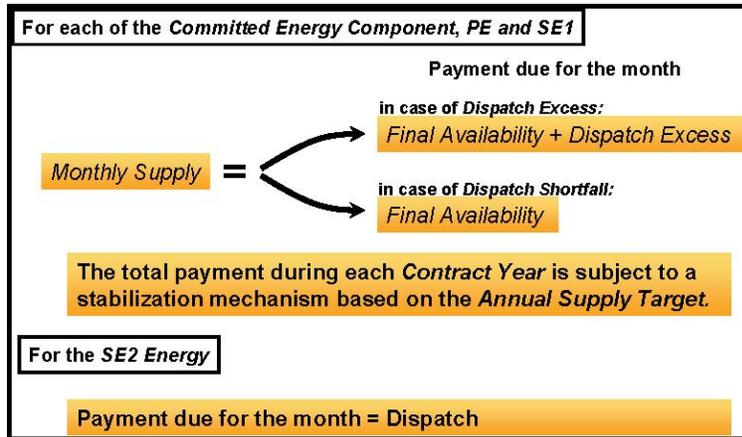


Exhibit 2

Nam Theun 2 Hydroelectric Project

Summary of project Cost estimates (\$ Million)

Item	Foreign Exchange	Local Currency	Total
A. Construction Costs			
1. Head Construction Contract	94.1	29.1	123.2
2. Civil Works	112.3	239.7	352.0
3. Electro-Mechanical	181.1	45.0	226.1
4. Project Implementation and Management	8.7	1.5	10.2
Subtotal (A)	396.2	315.3	711.5
B. Development Costs			
1. Pre-Operating and Working Capital	16.6	8.0	24.6
2. Environment & Social Mitigation	48.8	0	48.8
3. Compensation to Gov't. and Gov't. Works	32.2	0	32.2
4. NTPC Administration	29.6	4.0	33.6
5. Project Preparation	72.2	2.0	74.2
Subtotal (B)	199.4	14.0	213.4
C. Financing Costs			
1. Interest During Construction (IDC)	98.4	98.0	196.4
2. Insurance and Bonding	30.1	0	30.1
3. Other Financing Charges	44.5	8.3	52.8
Subtotal (C)	173.0	106.3	279.3
D. Contingencies			
1. Head Contract	6.1	5.8	11.9
2. Financial	21.0	12.9	33.9
Subtotal (D)	27.1	18.7	45.8
Total Project Base Costs	795.7	454.3	1,250.0
Contingent Costs			
A. Debt Service	50.0	52.5	102.5
B. Administrative Costs	6.6	0.9	7.5
C. Physical Cost Overruns	17.5	17.5	35.0
D. Liquidated Damages	42.5	12.5	55.0
Subtotal - Contingent Costs	116.6	83.4	200.0
Total Costs (Base + Contingent)	912.3	537.7	1,450.0

Notes:

1 Local Currency Costs are in Thai baht and Lao kip.

2 Under the Concession Agreement, GOL is to be compensated \$30 million for lost of biodiversity and eco-tourism assets.

3 Contingent Costs have been estimated on a 12-month delay scenario due to NTPC/contractor fault.

4 Under Contingent Costs, debt service includes additional IDC and first year principal repayment.

5 Project Preparation costs have been verified by independent audit before being accepted by lenders.

Source: NTPC.

Exhibit 3

Nam Theun 2 Hydroelectric Project

Financing Plan

	US\$ million	THB million		Total US\$ million equivalent
		Amount THB	US\$ equivalent	
Debt				
Export Credit Agency Facility	205.00			205.00
-COFACE	140.00			140.00
-EKN	30.00			30.00
-GIEK	35.00			35.00
IDA PRG Facility	45.00			45.00
ADB OCR Facility	45.00			45.00
ADB PRG Facility	45.00			45.00
MIGA PRG Facility'	45.00			45.00
AFD Facility	30.00			30.00
NIB Facility	30.00			30.00
Proparco Facility	30.00			30.00
Thai Exim Facility	25.00			25.00
THB Commercial Bank Facility		20,000.00	500.00	500.00
Total Long term debt	500.00	20,000.00	500.00	1,000.00
Tranche A	400.00	18,000.00	450.00	900.00
Tranche B	100.00	2,000.00	50.00	100.00
Equity				
Private Equity	332.74	190.54	4.76	337.50
GOL Equity**	112.50			112.50
-ADBL ^o an	16.10			
-AFDGrant	6.20			
-EIBL ^o an	41.00			
-IDAG ^o rant	20.00			
-GOL Contribution (clause 19.1of CA)	29.20			
Total Equity	445.24	190.54	4.76	450.00
Tranche A	345.24	190.54	4.76	350.00
Tranche B	100.00			100.00
Total base and contingent financing	945.24	20,190.54	504.76	1,450.00

Exhibit 4

Nam Theun 2 Hydroelectric Project

Project Financing Plan (\$ million) Indicative terms and conditions

Debt Facility	Base	Standby	Total	Base Case Drawdown2/	Tenor (3) years	Base rate (4)	Base cost	Base rate + Margin (5)	
								Pre-Con	Post-con
USD Debt:									
ECA	188.0	12.0	200.0	187.2	16.5	CIRR	5.00%	5.49–5.50%	5.34 - 5.35%
ADB	41.0	5.0	46.0	40.1	16.5	SWAP	5.25%	8.25–8.75%	8.00%
CBL/ADB PRG	41.0	5.0	46.0	39.9	16.5	SWAP	5.25%	7.05–7.40%	6.93%–7.37%
CBL/WB PRG	41.0	5.0	46.0	40.4	16.5	SWAP	5.25%	7.25–7.50%	7.40%–7.65%
CBL/MIGA	41.0	5.0	46.0	40.4	16.5	SWAP	5.25%	7.05–7.40%	6.93%–7.45%
AFD	27.0	3.5	30.5	26.6	16.5	SWAP	5.25%	8.25%	8.00%–8.25%
Proparco	27.0	3.5	30.5	26.6	16.5	SWAP	5.25%	8.25%	8.00%–8.25%
Thai EXIM	22.0	2.5	24.5	21.7	15.0	SWAP	5.25%	8.75%	8.75%
PPA Deve Security	15.0	-	15.0	-	7.5	LIBOR	5.25%	8.00%	8.00%
PPA Sup Security	20.0	-	20.0	-	7.5	MLR/LIBOR	0.00%	0.00%	0.00%
CA Securities	15.0	-	15.0	-	7.5	LIBOR	5.25%	8.00%	8.00%
NIB	27.0	3.5	30.5	26.6	16.5	SWAP	5.25%	8.25%	8.00%
Total USD	505.0	45.0	550.0	449.6					
THB Debt:									
THB CBL	450.0	50.0	500.0	449.6	15.0	MLR	6.25%–7.50%	8.00%–8.25%	9.00%
PPA Deve Security	15.0	-	15.0	-	8.5	MLR	6.25%–7.50%	9.00%	10.25%
PPA Sup Security	20.0	-	20.0	-	8.5	MLR	6.25%–7.50%	6.25%	7.50%
Total THB	485.0	50.0	535.0	449.6					
Total All Debt	990.0	95.0	1,085.0	899.2					

AFD = Agence Francaise de Developpement,
CBL/ADB PRG = Commercial bank loans with ADB Political Risk Guarantee, **CBL/MIGA** = Commercial bank loans with MIGA (Multilateral Investment Guarantee Agency) guarantee,
CBL/WB PRG = Commercial bank loans with World Bank (IBRD) Political Risk Guarantee,
CIRR = Commercial Interest Reference Rate,
ECA = Export Credit Agencies,
LIBOR = 6-month London Interbank Offered Rate,
MLR = Minimum Lending Rate for THB denominated commercial bank loans,
NIB = Nordic Investment Bank,
Proparco = Societe de Promotion et de Participation pour la Cooperation Economique,
SWAP = Swap rate for conversion of US dollar LIBOR based debt to a fixed rate,
THB CBL = Thai Baht denominated commercial bank loans,
Thai EXIM = Export - Import Bank of Thailand,
WCF = Working Capital Facility7/.

Notes:

- 1/ For THB loans, amounts are expressed in USD equivalent at THB/\$ = 40.
 - 2/ Estimated loan drawdowns under Base Case Scenario financial projections.
 - 3/ Period from initial drawdown (financial close) to final payment (maturity).
 - 4/ Floating rate debt is swapped to fixed rate.
 - 5/ Calculated as base rate plus lending margin, but excluding applicable upfront and commitment fees, guarantee fees, guarantee margins.
- Pre-Com: Construction pre-completion period.
Post-Com: Construction post-completion period.
- 6/ No drawdowns under Base Case Scenario.
 - 7/ Terms & conditions not yet finalized. Would likely be denominated in mix of USD & THB and, therefore, priced on basis of LIBOR and MLR.

Source: Nam Theun 2 Power Company.

Exhibit 5

Nam Theun 2 Hydroelectric Project

NTPC Projected Income Statements (\$ million - current prices)

	2009/10	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Revenue	241	210	213	216	219	222	225	228	232	235	238	241	245
Operating Expenses	26	22	22	20	20	25	18	19	18	20	27	37	25
Guarantee	2	2	2	2	2	1	1	1	1	1	0	0	0
Financing Charges	1	1	1	1	1	1	1	1	1	0	0	0	0
Gross Operating Profit	212	185	188	194	197	196	205	208	212	214	210	204	219
Depreciation	58	50	50	50	50	50	50	50	50	50	50	50	50
Earning Before Interest and Tax	154	136	139	145	148	146	156	158	162	165	160	154	170
Foreign Exchange Gain/Loss	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest Earning from Reserves	0	1	1	1	1	1	1	1	1	1	1	1	0
Net Interest Expenses	82	67	63	59	53	48	41	34	26	18	8	2	0
Profit Before Tax	73	70	77	87	96	100	116	126	138	149	154	153	170
Royalty and Income Tax	13	11	11	11	11	16	17	18	18	19	19	20	36
Net Income	60	59	66	76	84	84	99	108	119	130	134	133	134
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
Revenue	248	251	255	259	262	266	269	273	277	281	285	240	
Operating Expenses	25	23	23	24	33	22	26	26	31	34	36	27	
Guarantee	0	0	0	0	0	0	0	0	0	0	0	0	
Financing Charges	0	0	0	0	0	0	0	0	0	0	0	0	
Gross Operating Profit	223	228	232	235	229	243	243	247	245	246	248	213	
Depreciation	50	50	50	50	50	50	50	50	50	50	50	41	
Earning Before Interest and Tax	173	179	182	185	180	194	194	197	196	197	199	172	
Foreign Exchange Gain/Loss	0	0	0	0	0	0	0	0	0	0	0	0	
Interest Earning from Reserves	0	0	0	0	0	0	0	0	0	0	0	0	
Net Interest Expenses	0	0	0	0	0	0	0	0	0	0	0	0	
Profit Before Tax	174	179	182	185	180	194	194	197	196	197	199	172	
Royalty and Income Tax	37	38	60	61	60	86	87	117	117	118	119	102	
Net Income	137	141	122	125	120	108	108	81	79	79	79	70	

Exhibit 6

Nam Theun 2 Hydroelectric Project

NTPC Projected Cash Flow statements (\$ million - current prices)

	2009/10 _a	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Cash Flow from Operations													
EBITDA	212	185	188	194	197	203	205	208	212	214	216	222	224
Change in Working Capital	20	1	1	1	0	0	1	1	1	0	(0)	0	1
Interest Earned from Reserves	0	1	1	1	1	1	1	1	1	1	1	1	0
Royalty and Income Tax	13	11	11	11	11	16	17	18	18	19	19	20	36
Interest Paid	82	67	63	59	53	48	41	34	26	18	8	2	0
Net Cash Flow from Operations	97	108	115	125	133	140	148	157	168	179	190	201	187
Principal Repayment	37	50	57	65	73	79	86	95	104	114	93	47	0
Net Cash Flow before Transfers	61	57	58	60	61	61	62	63	64	64	97	154	187
Net Transfers to DSRA & MORA	58	2	3	3	(1)	2	5	2	2	1	(30)	(15)	5
Dividends Paid	2	55	55	57	62	59	57	60	62	64	127	169	182
Net Cash Flow	0	0	0	0	0	0	0	0	0	0	0	0	0
	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	
Cash Flow from Operations													
EBITDA	228	231	234	235	240	243	245	248	251	253	259	220	
Change in Working Capital	1	1	1	0	0	1	0	1	0	0	1	1	
Interest Earned from Reserves	0	0	0	0	0	0	0	0	0	0	0	0	
Royalty and Income Tax	37	38	60	61	60	86	87	117	117	118	119	102	
Interest Paid	0	0	0	0	0	0	0	0	0	0	0	0	
Net Cash Flow from Operations	190	192	173	174	180	156	158	132	134	134	139	117	
Principal Repayment	0	0	0	0	0	0	0	0	0	0	0	0	
Net Cash Flow before Transfers	190	192	173	174	180	156	158	132	134	134	139	117	
Net Transfers to DSRA & MORA	5	2	2	5	5	1	1	2	6	6	11	7	
Dividends Paid	185	190	171	168	174	155	158	130	128	128	128	111	
Net Cash Flow	0	0	0	0	0	0	0	0	0	0	0	0	

Exhibit 7

Nam Theun 2 Hydroelectric Project

NTPC Projected Balance Sheets (\$ million - current prices)

	2009/10 _a	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Assets													
Current Assets													
Receivables	34	35	36	36	37	37	38	38	39	39	40	40	41
Other Current Assets	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash & Reserve Accounts													
Debt Service Reserve Account	58	60	61	63	61	61	64	65	66	65	34	0	0
O&M Reserve Account	0	1	2	4	6	0	2	3	5	7	3	3	3
Total Current Assets	93	96	99	103	103	98	104	106	109	111	76	43	43
Fixed Assets													
Gross Fixed Assets (Opening Balance)	1,204	1,154	1,105	1,055	1,006	956	907	857	808	758	709	660	610
Accumulated Depreciation	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)
Net Fixed Assets	1,179	1,129	1,080	1,031	981	932	882	833	783	734	684	635	585
Total Assets	1,272	1,225	1,179	1,133	1,084	1,030	986	939	893	844	760	678	629
Liabilities & Equity													
Current Liabilities	2	2	2	2	2	2	2	2	2	2	3	3	2
Total Long-Term Liabilities	862	812	755	690	618	539	453	358	254	140	47	0	0
Shareholders' Funds													
Equity	350	350	350	350	350	350	350	350	350	350	350	350	350
Retained Earnings	58	62	73	92	114	139	182	229	287	353	361	325	277
Total Shareholders' Funds	408	412	423	442	464	489	531	579	637	703	710	675	627
Total Liabilities & Equity	1,272	1,225	1,179	1,133	1,084	1,030	986	939	893	844	760	678	629

Exhibit 7 (continued)

Nam Theun 2 Hydroelectric Project

NTPC Projected Balance Sheets (\$ million - current prices)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Assets												
Current Assets												
Receivables	41	42	43	43	44	44	45	46	46	47	48	48
Other Current Assets	0	0	0	0	0	0	0	0	0	0	0	0
Cash & Reserve Accounts												
Debt Service Reserve Account	0	0	0	0	0	0	0	0	0	0	0	0
O&M Reserve Account	3	3	3	8	3	3	3	3	3	3	3	3
Total Current Assets	44	44	45	51	46	48	47	48	49	49	50	51
Fixed Assets												
Gross Fixed Assets (Opening Balance)	561	511	462	412	363	313	264	214	165	115	66	17
Accumulated Depreciation	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(25)	(17)
Net Fixed Assets	536	486	437	388	338	289	239	190	140	91	41	0
Total Assets	580	531	482	438	384	336	287	238	189	140	91	51
Liabilities & Equity												
Current Liabilities	2	2	2	2	3	2	2	2	3	3	3	3
Total Long-Term Liabilities	0	0	0	0	0	0	0	0	0	0	0	0
Shareholders' Funds												
Equity	350	350	350	350	350	350	350	350	350	350	350	350
Retained Earnings	228	179	130	87	32	(15)	(65)	(114)	(164)	(213)	(262)	(302)
Total Shareholders' Funds	578	529	480	436	382	334	284	235	186	137	88	48
Total Liabilities & Equity	580	531	482	438	384	336	287	238	189	140	91	51

Exhibit 8

Nam Theun 2 Hydroelectric Project

NTPC – Project Cash Flows (\$ million - 2005 constant prices)

Year	Electricity Sales (GWh)			Costs				Sales Revenue	Net Cash Flow
	EGAT	EdL	Total	Capital	O&M	Taxes & Royalty	Total		
2005	0	0	0	(324.1)	0.0	(0.5)	(324.6)	0.0	(324.6)
2006	0	0	0	(206.5)	0.0	0.0	(206.5)	0.0	(206.5)
2007	0	0	0	(197.1)	0.0	0.0	(197.1)	0.0	(197.1)
2008	0	0	0	(136.6)	0.0	0.0	(136.6)	0.0	(136.6)
2009	808	24	833	(144.9)	(2.7)	(0.3)	(148.0)	30.9	(117.1)
2010	5,438	165	5,603	0.0	(18.9)	(10.8)	(29.7)	207.0	177.3
2011	5,354	178	5,532	0.0	(18.0)	(10.7)	(28.7)	205.9	177.2
2012	5,354	192	5,546	0.0	(18.2)	(10.8)	(29.0)	208.0	179.0
2013	5,354	200	5,554	0.0	(16.0)	(10.9)	(26.9)	210.0	183.1
2014	5,354	200	5,554	0.0	(14.5)	(11.0)	(25.5)	211.5	186.0
2015	5,354	200	5,554	0.0	(19.5)	(15.3)	(34.8)	213.2	178.4
2016	5,354	200	5,554	0.0	(13.3)	(16.1)	(29.4)	214.0	184.6
2017	5,354	200	5,554	0.0	(13.9)	(16.5)	(30.4)	214.8	184.4
2018	5,354	200	5,554	0.0	(12.8)	(17.1)	(29.9)	215.6	185.8
2019	5,354	200	5,554	0.0	(12.9)	(17.5)	(30.4)	216.5	186.1
2020	5,354	200	5,554	0.0	(16.6)	(17.7)	(34.3)	217.2	182.9
2021	5,354	200	5,554	0.0	(25.6)	(17.7)	(43.2)	218.1	174.9
2022	5,354	200	5,554	0.0	(15.7)	(32.5)	(48.1)	218.9	170.8
2023	5,354	200	5,554	0.0	(15.7)	(32.8)	(48.4)	219.7	171.3
2024	5,354	200	5,554	0.0	(13.7)	(33.3)	(47.0)	220.5	173.6
2025	5,354	200	5,554	0.0	(13.8)	(52.0)	(65.8)	221.4	155.6
2026	5,354	200	5,554	0.0	(12.3)	(52.3)	(64.5)	222.3	157.8
2027	5,354	200	5,554	0.0	(19.1)	(51.5)	(70.6)	223.1	152.6
2028	5,354	200	5,554	0.0	(11.9)	(72.5)	(84.4)	224.0	139.6
2029	5,354	200	5,554	0.0	(13.7)	(72.2)	(85.8)	224.8	138.9
2030	5,354	200	5,554	0.0	(13.0)	(96.3)	(109.3)	225.6	116.3
2031	5,354	200	5,554	0.0	(15.5)	(95.6)	(111.1)	226.5	115.3
2032	5,354	200	5,554	0.0	(16.3)	(95.6)	(111.9)	227.3	115.4
2033	5,354	200	5,554	0.0	(17.6)	(95.7)	(113.3)	228.2	114.9
2034	4,462	167	4,628	0.0	(14.8)	(81.1)	(95.8)	190.7	94.8

EdL = Electricité du Lao,
EGAT = Electricity Generating Authority of Thailand,
NTPC = Nam Theun 2 Power Company Limited,
O&M = operations and maintenance,

Exhibit 9

Nam Theun 2 Hydroelectric Project

**Government of the Lao People's Democratic Republic
Cash Flows (\$ million - 2005 constant prices)**

Year	Equity Injections	Revenue				Opex Gov't. LHSE	Net Cash Flow
		Royalty ^a	Income Tax	Dividends	Total		
2005	(69.5)	4.2	0.0	0.0	4.2	0.0	(65.3)
2006	(9.8)	0.0	0.0	0.0	0.0	0.0	(9.8)
2007	(6.6)	0.0	0.0	0.0	0.0	0.0	(6.6)
2008	(2.0)	0.0	0.0	0.0	0.0	0.0	(2.0)
2009	(1.0)	26.5	0.0	0.0	26.5	(0.1)	25.5
2010	0.0	10.8	0.0	0.5	11.3	(0.1)	11.3
2011	0.0	10.7	0.0	13.4	24.2	(0.1)	24.2
2012	0.0	10.8	0.0	13.4	24.2	(0.1)	24.2
2013	0.0	10.9	0.0	13.8	24.8	(0.1)	24.8
2014	0.0	11.0	0.0	14.8	25.8	(0.1)	25.8
2015	0.0	11.1	4.2	14.2	29.5	(0.1)	29.5
2016	0.0	11.1	4.9	13.4	29.5	(0.1)	29.5
2017	0.0	11.2	5.3	14.1	30.7	(0.1)	30.7
2018	0.0	11.2	5.8	14.3	31.4	(0.1)	31.4
2019	0.0	11.3	6.3	14.7	32.2	(0.1)	32.2
2020	0.0	11.3	6.4	28.9	46.6	(0.1)	46.6
2021	0.0	11.3	6.3	38.1	55.8	(0.1)	55.8
2022	0.0	11.4	21.1	40.7	73.2	(0.1)	73.2
2023	0.0	11.4	21.3	41.1	73.8	(0.1)	73.8
2024	0.0	11.5	21.8	41.6	74.9	(0.1)	74.9
2025	0.0	33.2	18.7	37.2	89.1	(0.1)	89.1
2026	0.0	33.3	18.9	36.2	88.5	(0.1)	88.5
2027	0.0	33.5	18.0	37.1	88.6	(0.1)	88.6
2028	0.0	33.6	38.9	32.7	105.2	(0.1)	105.2
2029	0.0	33.7	38.5	32.9	105.0	(0.1)	105.0
2030	0.0	67.7	28.6	26.8	123.1	(0.1)	123.1
2031	0.0	67.9	27.7	26.2	121.9	(0.1)	121.9
2032	0.0	68.2	27.4	25.9	121.6	(0.1)	121.6
2033	0.0	68.5	27.3	25.7	121.5	(0.1)	121.5
2034	0.0	57.2	23.9	21.9	103.0	(0.1)	103.0

^a Includes \$29.2 million Government payment, of which \$4.2 million is paid in 2005 and \$25.0 million in 2009.

Exhibit 11

Nam Theun 2 Hydroelectric Project

FIRR Sensitivity Analysis

Key Variable	Change	Project			Government	
		FIRR (%)	NPV	WACC (%)	FIRR (%)	NPV
Base Case		12.4	166.6	10.1	21.1	333.7
1. Construction Delay due to NTPC	6-month delay	11.2	75.4	10.2	18.8	295.5
2. Construction Delay due to NTPC	12-month delay	10.4	6.6	10.3	17.0	258.0
3. Construction Delay due to EGAT	6-month delay	11.7	115.5	10.1	19.8	315.8
4. Construction Delay due to EGAT	12-month delay	11.0	49.9	10.3	18.6	286.9
5. Reduction in NTPC Revenue	Only primary energy dispatched (a)	11.3	83.7	10.1	19.3	279.4
6. Change in Thai baht/\$ FX Rate	10% baht appreciation in 2005	12.6	193.7	10.1	21.6	356.6
7. Change in Thai baht/\$ FX Rate	10% baht depreciation in 2005	12.2	143.9	10.2	20.6	314.9
8. Variation in Hydrology	Reduced generation (b)	12.1	147.6	10.1	20.5	327.8
9. Combination of 2 and 5		9.5	(65.7)	10.3	15.5	209.0
10. Combination of 2 and 8		10.2	(10.6)	10.3	16.7	253.4

a Only primary energy (PE) dispatched. Therefore, secondary energy dispatched to EGAT, which is included in the base case is assumed to be zero under this scenario. As a result, total power dispatched over the concession period is 17% lower than under the base case, which reduces total revenue by 9%, expressed in constant prices.

b This case was developed to test a "worst case" hydrological scenario. It includes the driest sequence of years in the 50 years of available modeled data. It allows for both above and below average years and includes the lowest generation year and a number of other low generation years early in the operating period.

Source: Asian Development Bank estimates.