Project Finance Structuring: Case Study - Nam Theun 2

Session on Finance

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Project History

- 1970s - Mekong secretariat identified the hydropower potential of the Nam Theun River
- 1989/91 - World Bank feasibility study undertaken by Snowy Mountains Engineering Corp
- 1993 - Government of Lao PDR (GOL) and private sponsors (leader: Transfield) sign an agreement to develop the project
- 1994 - GOL asks World Bank to participate to the project financing
- 1997 - A first series of environmental and social safeguard documents is produced
- 1997/98 - Asian crisis: Laos and Thailand agree to delay the project development
- 2000 - EGAT and NTPC (leader: EDF) agree on a proposed electricity tariff (May 2000)

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**Project History (continued)**

- 2001 - Shareholders agreement signed between EDFI, EDL, EGCO and ITD (September 2001)
- 2002 - NTPC is created as a Lao company (September 2002)
- Concession agreement signed (October 2002)
- Joint work between GOL, World Bank and NTPC to finalize safeguards documents
- 2003 - Power purchase agreement signed (November 2003)
- 2004 - Project financing activities
- Completion of safeguards documents with the participation of WB, ADB and AFD
- 2005 - Financial close (June 2005) and beginning of full construction activities
- 2009 - Beginning of commercial operation (December 2009)

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Contractual Arrangements (continued)

- Head construction contract between NTPC and EDF-CIH provides for a date certain, fixed-price turnkey contract and comprises five major sub-contracts

- NTPC will take full responsibility for O&M for the project

- All environment and social commitments described in the concession agreement:
  - Long term
  - Binding
  - E&S : ~ 10% of total project costs
Summary of Project Base Cost Estimates ($ million)

<table>
<thead>
<tr>
<th>Item</th>
<th>Foreign Exchange</th>
<th>Local Currency</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Construction cost</td>
<td>396.2</td>
<td>315.3</td>
<td>711.5</td>
</tr>
<tr>
<td>b. Environmental-social</td>
<td>48.8</td>
<td>0.0</td>
<td>48.8</td>
</tr>
<tr>
<td>c. Development cost A</td>
<td>150.6</td>
<td>14.0</td>
<td>164.6</td>
</tr>
<tr>
<td>d. Financing cost B</td>
<td>173.0</td>
<td>106.3</td>
<td>279.3</td>
</tr>
<tr>
<td>e. Base contingencies</td>
<td>27.1</td>
<td>18.7</td>
<td>45.8</td>
</tr>
<tr>
<td>Total base cost</td>
<td>795.7</td>
<td>454.3</td>
<td>1,250.0</td>
</tr>
<tr>
<td>Total contingent costs</td>
<td>116.6</td>
<td>83.4</td>
<td>200.0</td>
</tr>
<tr>
<td>Total</td>
<td>912.3</td>
<td>537.7</td>
<td>1,450.0</td>
</tr>
<tr>
<td></td>
<td>63%</td>
<td>37%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Project Capital Structure

<table>
<thead>
<tr>
<th></th>
<th>US dollar ($ million)</th>
<th>THB ($ million equivalent)</th>
<th>Total ($ million)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity</td>
<td>345.2</td>
<td>4.8</td>
<td>350.0</td>
<td>28.0%</td>
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<tr>
<td>Debt</td>
<td>450.0</td>
<td>450.0</td>
<td>900.0</td>
<td>72.0%</td>
</tr>
<tr>
<td>Total</td>
<td>795.2</td>
<td>454.8</td>
<td>1,250.0</td>
<td>100.0%</td>
</tr>
<tr>
<td>%</td>
<td>63.6%</td>
<td>36.4%</td>
<td>100.0%</td>
<td></td>
</tr>
</tbody>
</table>
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**Exchange Rate Risk**

- Debt and equity are denominated in a mix of dollars (63%) and baht (37%) 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.
- EGAT and EdL will carry exchange rate risk.
- To the extent the Lao PDR government will receive royalty and taxes in dollars some of the risk will be mitigated.
The annual inflows have varied historically, on average, by approximately 20 percent from the long-term average of 7,526 million m³. This is almost double the capacity of the reservoir, so that in an average year, the reservoir should be fully replenished even after operating the plant at full capacity during the dry season.

- The minimum water flow recorded was 3,776 million m³ in 1998. This was the result of El Nino that brought droughts over much of Southeast Asia.

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Hydrology Risk (continued)

- The reservoir’s probable maximum capacity is 3,910 million m³ amounting to an annual mean energy of 5,700 GWh.
- 1998 would have been the only year since 1950 when the flow would not have been sufficient to fill the reservoir from empty.
- However, as the reservoir will not be fully emptied during operations but will always retain a minimum water level, even in 1998 the reservoir’s probable maximum active storage of 3,530 million m³ could have been filled by the water inflows.

- At full supply level (FSL) at an elevation of 538.0 m, the reservoir would have an area of 450 sq km and would hold 3,910 million cubic meters of water.
- The powerhouse would have an installed capacity of 1,070 MW.
- Annual energy generation of 5,462 GWh.

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Dispatch

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

- As EGAT is not required to dispatch all of NTPC’s declaration, if it dispatches less, dispatch shortfall occurs.

- As EGAT would have paid NTPC based on all of that declaration, it has the right to “make-up” subsequently, i.e. the right to dispatch for electrical energy without incurring any additional payment obligation.

- Dispatch excess: EGAT may dispatch more than all of NTPC’s declaration, subject to the limitations to be observed by EGAT in NTPC’s declarations.

Excess Dispatch

- 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.

- Increased risk of spillage during an excess energy month.

- All the dispatch excess energy as determined at the end of an excess energy month shall be accounted as SE2, provided, however, that the outstanding amount of accumulated dispatch shortfall energy is below 200 GWh.

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Offtake Risk

- Thailand 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.
- On the basis of demand forecast, excluding new plant from end-2003, the capacity surplus will be consumed by 2006.
- 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.
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Liquidity Risk

- The debt has to be repaid within 15 years - much less than the life of the project.
- 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.
  - 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.

Liquidity Risk

- The royalty and tax rates... (continued)
  - 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.
  - 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.
Country Risk

- Loans are guaranteed by
  - World Bank, ADB
  - Export Credit Agencies
- Development agencies loans
- Only THB loan not guaranteed

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