Project Experience in the Lao PDR Electric Power Sector: UN Workshop on Public-Private Partnerships (PPPs) for Infrastructure Development in the Lao PDR

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presented by Walter Heiser, Senior Counsel
Overview of Hydropower Sector

Key Existing and Proposed Dams in Laos

Legend:
- Existing Dam
- Dam Under Construction
- Planned Dam
- Border

## Overview of Hydropower Sector Comparison

| Lao PDR |
|-----------------|-----------------
| **Current HPP Capacity** | 3000 MW |
| **# of large-scale HPPs (over 5MW)** | 11 (6 JVA; 5 govt) |
| **Identified Hydropower Potential** | 26,500MW  
50 projects |
| **2020 Planned Capacity** | 12,500MW |
| **Basic Structure** | 15 to 25% paid shares  
1% Royalty?; tax exemptions  
Approx 5% output sold domestically  
26-30 year concession  
SPV – BOOT |
| **% of Total Capacity from HPP** | 97.3  
100.0  
| **2007** | **2030** |
| **Average Annual Growth of Hydro (%)** | 8.4 |

Source: 3rd ASEAN Energy Outlook, 2011
Energy Project and Financing Advantages

1. Strong Hydro Potential: High growth planned = Opportunity
2. Export Opportunities: EGAT; EVN; [China?]
3. Additional mine-mouth lignite opportunities?
4. Possible wind-energy / solar possibilities?
5. Access to large sums of int’l debt financing on reasonable terms;
6. Capacity to approve / negotiate multiple projects
7. Rapid development in 10 years (2005 to 2015) able to bring 10,00 MW (20 projects) to FC
8. Solid legal system covering E&S; project approvals; security
9. Financeable project docs; risk allocation policy; acceptable finance structures
10. EdL exports only? Advantage for EdL but will make financings more difficult
<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>COD</th>
<th>Offtaker</th>
<th>Finance</th>
<th>Ownership (initial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nam Ngum 5</td>
<td>120</td>
<td>2012</td>
<td>EdL</td>
<td>China Exim</td>
<td>EdL 15%; Sinohydro 85%</td>
</tr>
<tr>
<td>Nam Ngum 2</td>
<td>615</td>
<td>2010</td>
<td>95%+ EGAT</td>
<td>Thai Banks</td>
<td>EdL 25%; CH. Kanchang (Thailand) 28.5%; Ratchaburi 25%; Bangkok Expressway PCL 12.5%; 9% Others</td>
</tr>
<tr>
<td>Nam Lik 1-2</td>
<td>100</td>
<td>2010</td>
<td>EdL</td>
<td>CDB</td>
<td>EdL 10%; CWE (China) 90%</td>
</tr>
<tr>
<td>Nam Theun 2</td>
<td>1080</td>
<td>2009</td>
<td>95% EGAT</td>
<td>26 Banks &amp; IFIs</td>
<td>LHSE 25%; EDF (France) 35%; EGCO (TH) 25%; ITD 15%</td>
</tr>
<tr>
<td>Se Xet 2</td>
<td>76</td>
<td>2009</td>
<td>EdL</td>
<td>IFI / BFI</td>
<td>EdL 100%</td>
</tr>
<tr>
<td>Nam Mang 3</td>
<td>40</td>
<td>2004</td>
<td>EdL</td>
<td>IFI / BFI</td>
<td>EdL 100%</td>
</tr>
<tr>
<td>Nam Leuk</td>
<td>60</td>
<td>2000</td>
<td>EdL</td>
<td>IFI / BFI</td>
<td>EdL 100%</td>
</tr>
<tr>
<td>Houay Ho</td>
<td>152</td>
<td>1999</td>
<td>98% EGAT</td>
<td>Int’l Banks</td>
<td>Suez Energy (Belgium) 60%; HHTC (Thailand) 20%; EdL 20%.</td>
</tr>
<tr>
<td>Theun-Hinboun (Expansion)</td>
<td>210</td>
<td>1998 (1998 (2012)</td>
<td>95%+ EGAT</td>
<td>Intl Banks</td>
<td>EdL 60%; Nordic 20%; GMS 20%</td>
</tr>
<tr>
<td>Se Xet 1</td>
<td>45</td>
<td>1990</td>
<td>EdL</td>
<td>IFI / BFI</td>
<td>EdL 100%</td>
</tr>
<tr>
<td>Nam Ngum 1</td>
<td>155</td>
<td>1971</td>
<td>EdL</td>
<td>IFI / BFI</td>
<td>EdL 100%</td>
</tr>
</tbody>
</table>
## Story of Lao PDR Electric Power Sector: Details of Projects To Date (Over 5MW)

<table>
<thead>
<tr>
<th>Name</th>
<th>MW</th>
<th>Offtaker</th>
<th>Finance</th>
<th>Ownership (initial)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xayaburi</td>
<td>1285</td>
<td>EGAT/EdL</td>
<td>Thai Banks</td>
<td>EdL 20%; PT Construction 5%; PTT 25%; CK 30%; EGCO 12.5%; BKK Expressway 7.5%</td>
</tr>
<tr>
<td>Nam Ou Phase I</td>
<td>540</td>
<td>EdL</td>
<td>CDB</td>
<td>Sinohydro 85%; EdL 15%</td>
</tr>
<tr>
<td>Hongsa (lignite)</td>
<td>1,878</td>
<td>EGAT/EdL</td>
<td>Thai Banks</td>
<td>Banpu 40%; Ratch 40%; LHSE 20%</td>
</tr>
<tr>
<td>Xe Kaman 1</td>
<td>468</td>
<td>EVN</td>
<td>VDB</td>
<td>EdL 30%; VLP (Vietnam) 70%</td>
</tr>
<tr>
<td>Namphak</td>
<td>150</td>
<td>EdL</td>
<td>Negotiation</td>
<td>Nava Bharat 70%; KGP 15%; EdL 15%</td>
</tr>
<tr>
<td>XPXN</td>
<td>400</td>
<td>EGAT/EdL</td>
<td>Thai &amp; Int’l Banks</td>
<td>SK 26%; Kowepo; 25% Ratch 25%; LHSE 24%</td>
</tr>
<tr>
<td>Nam Ngiep 2</td>
<td>280</td>
<td>EdL</td>
<td>CDB</td>
<td>CWE 90%; EdL 10%</td>
</tr>
<tr>
<td>Nam Ngiep 1</td>
<td>262</td>
<td>EGAT/EdL</td>
<td>Thai &amp; Int’l banks</td>
<td>Kansai 45%; EGATi 30%; LHSE 25%</td>
</tr>
<tr>
<td>Xekaman 3</td>
<td>250</td>
<td>EVN</td>
<td>VDB</td>
<td>EdL 15%; VLP (Vietnam) 85%</td>
</tr>
<tr>
<td>Nam Khan 2&amp;3</td>
<td>173</td>
<td>EdL</td>
<td>China ExIm</td>
<td>Sinohydro 85%; EdL 15%</td>
</tr>
<tr>
<td>Nam Tha 1</td>
<td>170</td>
<td>EdL</td>
<td>China BFI</td>
<td>CSGI 80%; EdL 20%</td>
</tr>
<tr>
<td>Nam Phay</td>
<td>140</td>
<td>EdL</td>
<td>China BFI</td>
<td>Norinco (China) 85%; EdL 15%.</td>
</tr>
<tr>
<td>Nam Kong 2</td>
<td>66</td>
<td>EdL</td>
<td>BIDV</td>
<td>Hoang Anh Gia Lai Group (Vietnam) 100%</td>
</tr>
<tr>
<td>Nam Lik 1</td>
<td>65</td>
<td>EdL</td>
<td>Thai Banks</td>
<td>HEC 40%; PTTi 40%; POSCO 10%; EdL 10%</td>
</tr>
</tbody>
</table>
1. Socialist System: Assets and Resources State owned

2. First HPP 1971 (Nam Ngum 1).
   1. EdL owned projects for EdL supply,
   2. Financed by Aid grants and loans

3. HPPs from 1970 to 1995 (6) all Government owned and developed. IFI or BFI financed.

4. 1988 opened sector to foreign investment.

5. Over 100 HPP MOUs signed to date. No Public (or Private) tender. Private negotiations. BIG INTEREST

6. Bilateral MOUs signed with Thailand and VN.

7. THPC (98) / Houay Ho (99): First IHPPs, Int’l Finance.

8. NN2: First Thai financed; Nam Lik 2 (EdL Off-taker).
6. **1st Project Finance (non recourse) PPP: THPC (COD 1998 (FC 1995?)); 210MW**

1. Elevated head, Run of River
2. 60% EdL / 40% private shareholders (Thailand and Norway)
3. Project Finance Basis: International Banks (Nordic); IFIs (ADB); Thai Baht consortium (50/50)
4. EGAT supply, 25 year take or pay based on availability; 50/50 THB/USD tariff (fixed exchange rate); tariff rate increase 1% only, renegotiate after 10 years.
5. EdL Equity funding 60% equity from ADB and BFIs (on lent to EdL to contribute to Project Company).
6. Offshore accounts and ADB negative pledge in favor of commercial lenders.
7. 30 year BOT Concession Agreement, global exemption from conflicting laws.
8. ADB sponsor govt adviser and other TA for govt.
9. Diversion through tunnel from one stream (Nam Theun) to another (Nam Hai): fishery, environmental and social issues. ADB TA work.
10. Resettlement 3,000 pax.
Structure of Theun Hinboun HPP

FINANCING AND OWNERSHIP STRUCTURE
($ million)

7. **2nd Project, PPP: Houay Ho; COD 1999 (FC 1995); 150MW**
   1. 20% EdL / 80% Private shareholders (Daewoo and Loxely)
   2. Daewoo financed, including equity loan to EdL (10M USD)
   3. Export Credit
   4. EGAT supply; 25 year take or pay.
   5. Resettlement 3,000 pax.

8. **Financial Crisis: Late 1990s– New Lao PDR Power Projects on hold**
9. **Nam Theun 2: Game Changer? Or Evolutionary progress**

1. 26 Banks and IFIs (1.15B debt)
2. 70/30 debt to equity
3. PRG from IDA, MIGA and ADB
4. First WB finance project for decades
5. Int’l Standard E&S (Equator, etc)
6. Modified legal system and approvals
7. Set NA Itemized Exemptions from and Approvals under Law Method as precedent (v. CA above the law method)
8. EGAT supply, 25 year
9. LHSE (GOL Holding Co) rather than EdL (Offtaker)
10. 30 Year CA, itemized exemption from specific laws.
Case Study: The NT2 contractual matrix
Case Study: Xe-Pian Xe-Namnoy Project Financing

Financing Type: Thai banks
Size: USD 1.02 billion

Challenges
- First Thai financing to non-Thai exclusive investment
- FOREX risk as Thai Banks finance in USD
- Flexibility: Structure permitting post-closing accession by multilateral lenders
- Account structure - change of central bank policy on requirement for equity subscription on domestic bank account

Security structure
- Stand-alone Lao Law security interests over distinct categories of Project Assets situated in Lao PDR
- Thai Law assignment of EGAT PPA, Thai Pledge of Collateral Accounts, etc.
- English Law assignments of each English Law Project Document and Backstop English Law debenture, etc.
10. Nam Ngum 2: First wholly Thai financed and developed IPP (EGAT)

11. First “Project” Financed, Domestic Supply: Nam Lik 1-2
   - 50MW supplied to EdL
   - CWE with China Exim financing
   - PRG (Sinosure, etc?)
   - MOF Guarantee

12. Institutional Reform
   - MEM (take from MIH)
   - MONRE (take from WREA, from STEA)
   - NLMA
   - DEB as One Stop; Legal Team

13. IPO of EdL HPP assets creating EdL-Gen

14. Thai Financed Mega Projects

15. Reduced Role if IFIs for Debt; Continue role for PRG, ECA, EdL and LHSE equity financing

16. 10+ Projects under negotiation

17. Tightening of Govt concessions on Royalty, Tax, exemptions, MOJ LO, DAs, etc.
Ownership of Lao PDR HPP by Country (weighted)

- **Thailand**: 37%
- **Laos**: 21%
- **China**: 21%
- **Vietnam**: 6%
- **Russia**: 5%
- **France**: 3%
- **Japan**: 2%
- **Malaysia**: 3%
- **Japan**: 2%
- **Others**: 2%

1. **Key role of Offtaker to raise financing; EGAT paved way for domestic supply projects**
   - To date, Nam Lik 1 is only EdL-only off-taker project with true limited recourse financing
   - All EGAT PPA projects are pure PF basis with commercial lenders
   - Chinese-financed project are a hybrid of limited recourse + parent company guarantee

2. **Key role of IFIs**
   - Provide comfort to commercial lenders (THPC and NT2)
   - Improve legal system standards, etc E&S through TAs
   - Paved way for Thai bank financed projects
   - Provide PRG
   - Finance govt equity

3. **GOL equity financing issues key**
   - Options: MOF to EdL to LHSE to EdL Gen IPO
   - IFI debt financing (and BFI)
   - Dividend Financed Shares
   - Tax and royalty financed shares (requires NA/NASC approval)
   - Buy in rights not common. Negative for financing due to uncertainty.
   - Divestment if no investment: GOL position is “no dilution”.

Lessons Learned
## Cross-Border Memorandums of Understanding

<table>
<thead>
<tr>
<th>Year Signed</th>
<th>Thailand</th>
<th>Vietnam</th>
<th>Cambodia</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1993</td>
<td>1998</td>
<td>1999</td>
</tr>
<tr>
<td>Initial Capacity to be Sold</td>
<td>1,500MW</td>
<td>2,000MW</td>
<td>1,500MW</td>
</tr>
<tr>
<td>Latest Update</td>
<td>2007</td>
<td>2008</td>
<td>--</td>
</tr>
<tr>
<td>New Capacity to be Sold</td>
<td>7,000MW by 2020</td>
<td>5,000MW by 2020</td>
<td>1,500MW by 2020</td>
</tr>
</tbody>
</table>
2010 - EdL-Generation Co. Ltd (EdL-Gen) was incorporated as a subsidiary of Electricité du Laos (EdL).

- 25% floated on Lao Securities Exchange; up to 49% float
- 75% owned by EdL
- EdL 100% owned by GOL

2011 - EdL-Gen participated in an IPO on the Lao Securities Exchange becoming the first company to list

- Operates 7 HPPs totaling 387MW
  - Nam Ngum 1
  - Nam Song
  - Nam Leuk
  - Xeset 1 & 2
  - Nan Mang 3
  - Selabam
2012 - EdL-Gen approved the transfer of shares in four IPPs owned by Electricité du Laos
- 60% of shares in Theun-Hinbeun (300MW)
- 10% of shares in Nam Lik 1-2 (100MW)
- 25% of shares in Nam Ngum 2 (153.75MW)
- 20% of shares in Houay Ho (30MW).

Post-2012:
- 15% of shares in Nam Ngum 5 (120MW)

EdL-Gen also plans to purchase 2 HPPs from Electricité du Laos that are currently under construction:
- Nam Khan 2 (126MW)
- Huaylamphan Nhai (88MW)
5. Exemptions from Law key to resolve lender issues: Blanket or itemized?

a. Required Approvals
   - NA/NASC Approval required for most power projects

b. Exemptions from Law and Regulations: Lao PDR Approach
   - Require NA or NASC Resolution
   - Narrow detailed list v. broad approach
   - Govt reducing available exemptions
   - CA: list of exemptions and approvals

c. Royalties in Lao HPPs
   - Rate not set by law—negotiable but 1% of gross revenues is generally the minimum.

d. Tax Exemptions
   - Former broad “tax free” regime is no more. In particular, VAT must be paid.
   - Tax incentives are granted on a discretionary basis and cannot be said to be granted routinely.
6. **Standardization of Contracts and Policies**
   - Developing standardised approach
   - International standard docs and structure (Direct agreements, Guarantees, legal opinions). DEB plays a key role.

7. **Facilitate the Agreement Process**
   - Once Stop Agency (DEB) for negotiation
   - Consistency in staff
   - Govt Legal and Technical Advisers to move process forward and communicate with Legal and Tech advisers from Lenders and developers. Who pays?

8. **Legal Framework supportive of financing (flexibility to change laws quickly to address project issues).**
<table>
<thead>
<tr>
<th>Category</th>
<th>Law and Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>Investment Promotion Law 2009</td>
</tr>
<tr>
<td>Companies</td>
<td>Enterprise Law 2013</td>
</tr>
<tr>
<td>Forestry</td>
<td>Forestry Law 2007</td>
</tr>
<tr>
<td>Water</td>
<td>Water and Water Resources Law 1996; Fisheries Law 2009</td>
</tr>
<tr>
<td>Environment</td>
<td>Environmental Protection Law 2012; EIA Decree 2010</td>
</tr>
<tr>
<td>Electricity</td>
<td>The Electricity Law 2011</td>
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<tr>
<td>Land</td>
<td>Land Law 2003; Decree on State Land Concession 2009</td>
</tr>
<tr>
<td>SOEs</td>
<td>Enterprise Law 2013; Decree on Management of State Invested Enterprises 2002</td>
</tr>
<tr>
<td>Security</td>
<td>Secured Transactions Law 2005; Secured Transactions Decree 2011</td>
</tr>
</tbody>
</table>
9. **Debt Financing Issues**

a. Political Risk Insurance required?

b. EdL financial capability? Possible earmarking of EGAT export revenues?

c. Necessity of GOL Guarantee for EdL-only off-take?
   - Project shareholder guarantee?

d. Parent company guarantees? Required by Chinese lenders

e. Necessity of Pledge of GOL Shares (EdL, LHSE)

f. Necessity of pledge of offshore bank accounts
   - Problem for EdL offtaker structure
   - Equity contributions: held onshore or offshore?
10. Positive Evolution of Institutions and Procedures

a. Lao PDR succeeded without solid institutional framework initially, but moved quickly to One Stop Negotiations Authority and clearer regulatory spheres

b. Lao PDR succeeded without Complete Legal Framework. Why?
   - Flexibility and Adaptability
   - Accept changes to legal framework required by lenders and developers
   - Granted Exemption to Laws
## Lao PDR

<table>
<thead>
<tr>
<th>Role</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulator</td>
<td>None</td>
</tr>
<tr>
<td>Transmission</td>
<td>EdL; Private or PPP</td>
</tr>
<tr>
<td>Generator</td>
<td>EdL; PPP Joint Ventures</td>
</tr>
<tr>
<td>Distributor</td>
<td>EdL; EdL-Gen</td>
</tr>
<tr>
<td>Policy-maker</td>
<td>Ministry of Planning and Investment, MEM; MONRE</td>
</tr>
<tr>
<td>O&amp;M</td>
<td>EdL</td>
</tr>
<tr>
<td>Equity Investment</td>
<td>EdL; EdL-Gen; LHSE</td>
</tr>
</tbody>
</table>