

Power Sector Strategy and Northern Expansion Plan

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INTRODUCTION

- Outline Power Sector of Laos
- Power Sector Policy, Strategy and Development
- Institutional Structure
- Northern Expansion Plan
- [Availability of Data](#)
- Conclusions



BASIC FACTS ABOUT LAOS

1. **Country:** Centrally located in GMR
Area = 236,800 km²
Mountainous, land locked and tropical
2. **Population:** 5.4 million
78% in rural areas
2.9% annual pop. growth
Life expectancy 52 years
10% infant mortality
4. **Economy:** Narrow base - resource exploitation
GNP per capita of US\$350
GDP growth of 7% annually
60% of GDP from agriculture

STATISTICS (2001)

| No | Provinces | Number of | | | | Electrified | | | | | |
|--------------|----------------------|------------|---------------|----------------|------------------|-------------|--------------|--------------|--------------|----------------|-------------|
| | | Dist | Villages | hh | Pop | Dist | % | Villages | % | hh | % |
| 1 | Vientiane Prefecture | 9 | 494 | 102,610 | 575,204 | 9 | 100 | 465 | 94.13 | 98,510 | 96.0 |
| 2 | Phongsaly | 7 | 642 | 27,413 | 158,832 | 4 | 57.14 | 32 | 4.98 | 2,339 | 8.5 |
| 3 | Luangnamtha | 5 | 404 | 23,027 | 126,925 | 5 | 100 | 37 | 9.16 | 2,922 | 12.7 |
| 4 | Oudomxay | 7 | 693 | 42,176 | 241,047 | 2 | 28.57 | 44 | 6.35 | 3,485 | 8.3 |
| 5 | Bokeo | 6 | 376 | 22,121 | 125,069 | 3 | 50 | 36 | 9.57 | 2,828 | 12.8 |
| 6 | Luangprabang | 11 | 1,186 | 70,411 | 371,030 | 11 | 100 | 273 | 23.02 | 18,055 | 25.6 |
| 7 | Huaphan | 8 | 853 | 38,815 | 264,056 | 8 | 100 | 129 | 15.12 | 8,750 | 22.5 |
| 8 | Xayabury | 10 | 533 | 56,406 | 316,490 | 7 | 70 | 83 | 15.57 | 9,279 | 16.5 |
| 9 | Xiangkhuan | 7 | 528 | 31,232 | 218,819 | 7 | 100 | 48 | 9.09 | 4,073 | 13.0 |
| 10 | Vientiane | 12 | 583 | 58,677 | 344,203 | 8 | 66.67 | 311 | 53.34 | 30,539 | 52.0 |
| 11 | Borikhamxay | 6 | 323 | 33,453 | 199,891 | 5 | 83.33 | 116 | 35.91 | 11,974 | 35.8 |
| 12 | Khammuaone | 9 | 804 | 55,231 | 297,821 | 8 | 88.89 | 302 | 37.56 | 21,820 | 39.5 |
| 13 | Savannakhet | 15 | 1,543 | 124,222 | 739,253 | 13 | 86.67 | 406 | 26.31 | 43,104 | 34.7 |
| 14 | Saravane | 8 | 724 | 51,810 | 289,335 | 8 | 100 | 189 | 26.10 | 12,387 | 23.9 |
| 15 | Sekong | 4 | 337 | 12,964 | 73,905 | 2 | 50 | 23 | 6.82 | 2,155 | 16.6 |
| 16 | Chantpasak | 10 | 915 | 94,494 | 546,140 | 10 | 100 | 269 | 29.40 | 28,805 | 30.5 |
| 17 | Attapeu | 5 | 208 | 15,993 | 87,229 | 3 | 60 | 24 | 11.54 | 1,703 | 10.6 |
| 18 | Khet Piseth Xaysom | 3 | 85 | 5,222 | 33,607 | 3 | 100 | 24 | 28.24 | 962 | 18.4 |
| Total | | 142 | 11,231 | 866,277 | 5,008,856 | 116 | 81.69 | 2,811 | 25.03 | 303,690 | 35.9 |

LOAD FORECAST LAO PDR AND NORTHERN REGION

"Base Case" National Load Forecast

| | 2000 | 2005 | 2010 | Average growth 1999- 2010 |
|--|---------|---------|---------|------------------------------------|
| Electricity Sent-Out (GWh) | | | | |
| Northern Area | 18.5 | 37.5 | 67.4 | 13.7% |
| Central Area I | 608.6 | 998.1 | 1,565.9 | 10.2% |
| Central Area II | 157.6 | 343.1 | 640.1 | 15.0% |
| Southern Area | 86.4 | 149.5 | 253.0 | 11.4% |
| Total Country | 871.2 | 1,528.2 | 2,526.5 | 11.5% |
| Energy Losses (% of sent-out) | | | | |
| | 25% | 20% | 20% | |
| Average Household Consumption (kWh/mon) | | | | |
| | 97 | 109 | 126 | |
| Number of Households electrified | | | | |
| | 271,835 | 359,894 | 447,954 | |
| Rate of Electrification | | | | |
| | 35.3% | 41.2% | 45.1% | |
| Maximum Demand Sent-Out (MW) | | | | |
| Northern Area | 6.4 | 13.2 | 24.1 | 14.0% |
| Central Area I | 114.8 | 182.3 | 277.1 | 9.4% |
| Central Area II | 29.0 | 61.2 | 110.7 | 14.3% |
| Southern Area | 18.6 | 32.2 | 54.5 | 11.6% |
| Total Country | 168.9 | 288.9 | 466.4 | 10.8% |
| System Load Factor (%) | | | | |
| | 58.9% | 60.4% | 61.8% | |

POWER SECTOR POLICY

1. **Maintain, expand, affordable, reliable electricity for economic and social development,**
2. **Promote power exports for revenues to fulfill development objectives,**
3. **Develop legal and regulatory framework,**
4. **Strengthen institutions & structures to strengthen functions and administration**

Strategies

- Satisfy domestic demand
- Extend electrification to rural areas
- Provide foreign exchange through exports
- Meet commitments of inter-governmental MOUs
- Cooperate with neighboring countries in supplying border communities
- Reduce dependence on imported fuels for generation
- Consolidation of the long term financial viability of the national power utility, EDL

Objective: : *Expand and improve Main Grid supplies*

- *Increase electrification in rural areas and expand EdL's customer base through socially beneficial and feasible extensions of the Main Grids.*
- *Improve system optimization and strengthen network security in the Main Grids through interconnections and improvements.*
- *Augment generating capacity to satisfy demand growth in the Main Grids. (i) development of small to medium domestic hydropower projects (generally up to 100 MW), (ii) contracting with IPPs for domestic off-take entitlements, and (iii) imports from neighboring countries. To maintain an affordable and competitive supply, EdL's generation expansion planning is based on least-cost principles with generation projects*

Objective: : *Expand and improve Off Grid supplies*

- *Target key demand areas based on optimal resource use and sustainability of investment.* Target areas will include:
 - - Focal villages, new settlements or zones requiring first call on services;
 - - Areas identified as most likely to optimize income-raising and socio-economic benefits from electricity supply;
 - - Locations where environmental protection and rural development measures are complemented by electricity supply;
 - - Locations where organizational initiative is demonstrated as adequate to assure reliable and expanded supply.
- *(b) Strengthen capacity within the provinces for planning, management and maintenance of Off Grid supply initiatives.* Capacity strengthening will be achieved primarily by:
 - - Training and resourcing of provincial and district authorities;
 - - Training and resourcing of provincially-based ESCOs and Village Managers.

Objective: : *Expand and improve Off Grid supplies*

- *Develop mechanisms for assurance of reliable performance and expansion of supply, particularly mechanisms based on incentive systems.* Village Managers and ESCOs will be motivated to maintain reliability and increase connections by appropriate remuneration mechanisms using tariff payments structured to recover costs, mobilize village resources and attract donor assistance (e.g. micro-credit support).
- *(d) Mobilize financial resources for Off Grid activity, in particular from foreign assistance lenders and donors (see Annex C).* GOL will seek grants and concessional loans to provide capital cost subsidies for Off Grid developments to establish them on an independent, affordable and commercially sustainable footing. GOL promotes financing modalities.

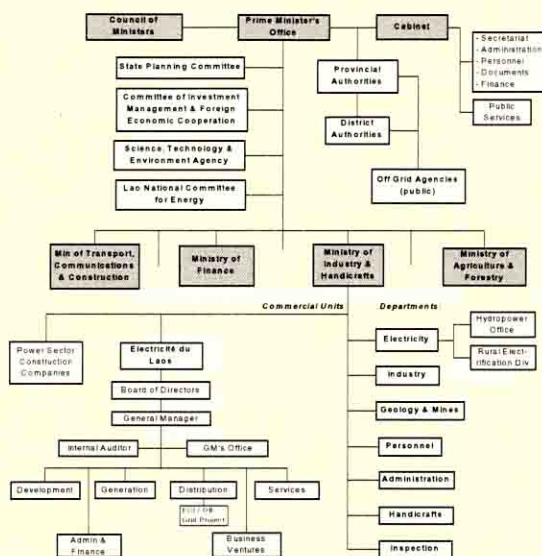
Objective: *Expand and improve Off Grid supplies*

- *Implement Off Grid to complement other social, economic, and environmental priorities of localities.* The planning process for electricity supply will engage villagers representing different genders and socio-economic groups in a participative consultation process. It will include prior review of development projects in other sectors with a view to reinforcing other initiatives.
- *Introduce local manufacture, assembly and provincial servicing network.* GOL policy is to develop a technical skill base for repairs and supply of spare parts for Off Grid projects. Training and financial support for manufacture and supply of components will be promoted, particularly in provincial and district towns.

Objective: *Increase energy self-sufficiency and security*

- *Reduce dependence on energy imports.* GOL policy is to reduce the use of imported fuels for electricity generation by substituting indigenous energy sources, principally hydropower but also solar, coal and biomass.
- *Maintain secure domestic electricity supply.* GOL will promote mutually beneficial exchanges of electricity with neighboring countries at local and regional levels while assuring reliable domestic supplies for key areas of economic and social activity as a first priority.

ORGANISATION OF POWER SECTOR



Institutional Structure

Committee for Investment & Economic Coop. (FIMC)

- High level committee within Prime Minister's Office responsible for administration and regulation of foreign investment. Provides an initial "One-stop-shop" service to foreign investors.

Ministry of Industry & Handicrafts (MIH)

- Ministry (inc Department of Electricity) is responsible for policy formulation and strategic power sector planning which are undertaken jointly with line Ministries and Agencies.

Electricite du Laos (EdL)

- EdL develops, owns and operates the country's main generation, transmission, and distribution assets, and manages electricity imports its grids and exports from its station. It is a state owned corporation reporting through own board director.

Institutional Structure(Cont...)

Science, Technology & Environment Agency(STEA)

- Main coordinating agency for environmental planning and management across all sectors. Its responsibilities under the Environmental Protection Law include developing strategies for implementing environmental policy, coordinating environmental management at a national sectoral level. It has authority over the licensing of organization engaged in providing environmental service

Lao National Committee for Energy(LNCE)

- GOL agency with powers to manage the development and marketing of power projects for export to ensure effective implementation of strategic plans for energy and electric power development in Lao PDR

POWER SECTOR IN LAOS

- **Domestic** EdL responsible for generation, transmission and distribution.
Projects up to 60 MW developed by EdL
EdL projects for domestic market but brought on early to earn export revenues.
- **Export** MOUs signed between GOL and governments of Thailand and Vietnam:
 - Thailand - 3,000 MW by 2006
 - Vietnam - 1,500 to 2,000 MW by 2010Agreement to cooperate with Cambodia

Rural Electrification: Tariff

- The rural electricity tariff are not yet classified but depend on supply areas/capability to pay by local people
- for example:

Micro/Mini hydro plant (off-grid) 150- 300 Kip/kWh or 1500-3000 lamp/month

Diesel Generators: it depend on fuel supply tariff but some areas Government has to subsidy

> 5 kWh/month, charge =1500 Kip/kWh

< 5 kWh/month, charge= 6000-7500 lamp¥month

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