

## Nam Ngum 2 Hydroelectric Power Project Lao PDR



### Project Description

The Nam Ngum 2 Hydroelectric Power Project is located in Lao PDR, roughly 90 km north of the capital city Vientiane, approximately 35 km upstream of the existing Nam Ngum 1 dam. It is located on the Nam Ngum River, which is one of the major tributaries to the Mekong River.

The project is with an installed capacity of 615 MW is being built to produce energy for the Thai electricity grid and all the output will be sold to the Electricity Generating Authority of Thailand (EGAT). After having been involved in the development of the project since 1994 Pöyry Energy Ltd has been commissioned by the Nam Ngum 2 Power Company Ltd. to

serve as independent engineer during the project implementation.

The project comprises cofferdams, two river diversion tunnels, a concrete faced rockfill dam (CFRD) of 185 m height, a gated spillway with chute and flipbucket and a power waterway system consisting of a headrace tunnel, manifold and three inclined pressure shafts which are steellined and an above-ground powerhouse with 3 x 205 MW units and is to produce ~2'220 GWh of energy per year. The reservoir volume is approximately 4'200 million m<sup>3</sup>. Construction is scheduled to be completed by the end of February 2011.

### Client

Nam Ngum 2 Power Company Ltd.

### Project

Dam and hydropower scheme for power generation

### Service Provider

Pöyry Energy Ltd., Zurich, Switzerland

### Services

- Feasibility study (1994/95)
- Environmental Impact Assessment
- Project upgrade studies
- Outline design and tender documents
- Independent Engineer during project implementation with main tasks of:
  - Checking and approval of civil works construction design
  - General supervision of site activities
  - Progress and quality control of civil works
  - Design approval of electro-mechanical, hydro-mechanical and transmission line works
  - Supervision of erection and commissioning of electro-mechanical, hydro-mechanical equipment and transmission line works.

### Execution Period

1994/95 Feasibility design  
2004/06 Update and tender design  
2005/11 Construction phase

### Pöyry Energy Ltd.

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### Key Data

#### Hydrology

Catchment area 5'640 km<sup>2</sup>  
Annual inflow 6'200 million m<sup>3</sup>

#### Reservoir

Full supply level, FSL EL 375.0 m  
Min. operating level EL 345.0 m  
Active storage 2'425 million m<sup>3</sup>  
Reservoir volume 4'230 million m<sup>3</sup>  
Reservoir area at FSL 100 km<sup>2</sup>

#### Diversion structures

Number of tunnels, concrete lined 2  
Length 1'100 m/ 1'210 m  
Diameter 11.7 m  
Upstream and downstream cofferdams

#### Dam

Type Concrete face rockfill dam  
Height above lowest foundation 185 m  
Crest length 470 m  
Crest Elevation EL 381.0 m  
Dam Volume approx. 9 million m<sup>3</sup>

#### Spillway

Type Gated overflow crest, aerated concrete chute and flip bucket  
Type of gates 3 radial gates  
Size of gates 16.5 x 17 m  
Capacity (PMF) 9'000 m<sup>3</sup>/s

#### Power waterways

Headrace tunnel length 525 m  
Diameter 10.7 m  
Number of penstocks 3  
Length (average incl. manifold) approx. 295 m each  
Diameter 6.2 / 5.35 m steel lined

#### Powerhouse

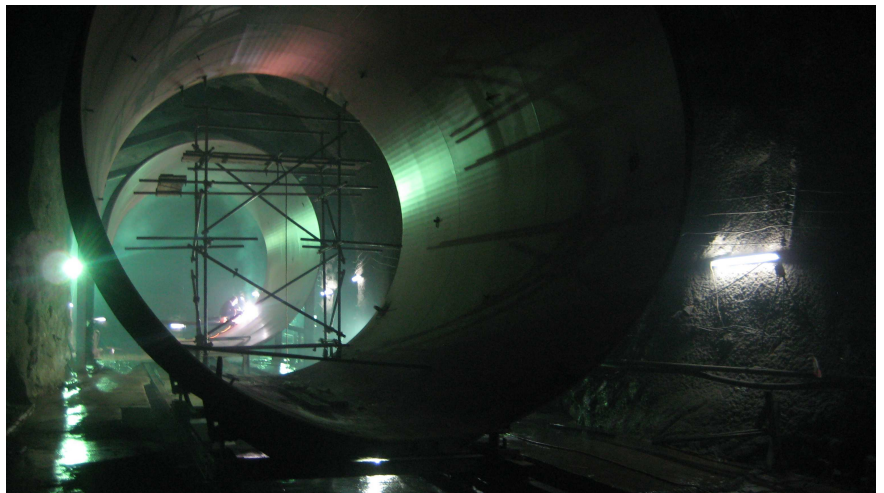
Location Adjacent dam toe  
Size (l x w x h) 86 x 22.5 x 51.4 m  
Net head 159.5 m for 3 units in operation  
Valves 3 Butterfly  
Turbines 3 Francis  
Rated speed 214.3 rpm  
Turbine 152 m<sup>3</sup>/s per turbine at discharge FSL  
Installed capacity 3 x 205 = 615 MW  
Annual energy, total 2'218 GWh

#### Transmission Line

Total length 95 km  
Type double circuit 230/500 kV



Powerhouse Construction



Steel liners awaiting transportation into inclined shaft



Barge transportation to site