

Nam Theun 1 Dam Hydropower Info by Hobo Maps - [Home](#) [Go Back to Hydropower Projects Web Page](#)

Nam Theun 1 concept image below of what the completed dam site is planned to look like:



Nam Theun 1 Dam images below:











Construction images of Nam Theun 1 Dam project below:



Construction of the project started in 2017, the reservoir impounding began in June 2021 and commissioning is scheduled for mid 2022.



The project is on the Nam Kading (river) about 33 km upstream from where the Nam Kading joins the Mekong near Pak Kading.

Nam Theun 1 Hydropower Project location is shown in satellite image below:



The project is being developed by Nam Theun 1 Power Company, a joint venture of Phonesack Group (PSG 32%), Chaleun Sekong Energy Company (CSE 28%), Electricity Generating Public Company of Thailand (EGCO 25%), and Electricite Du Laos (EDL 15%).

Project cost is estimated at US\$ 1,335 million with major financing provided by Bangkok Bank, Export-Import Bank of Thailand, Siam Commercial Bank and TISCO Bank.

The project will operate as Build-Operate-Transfer (BOT) type with a concession period of 27 years.

The project is designed for hydro-peaking with 80% of output going to Electricity Generating Authority of Thailand (EGAT) and 20% to Electricité du Laos (EDL).

The 650 MW project can generate up to 2,538 GWh output per year. The project has a 27-year power purchase agreement with EGAT for offtake of 514 MW capacity and with Electricité du Laos (EDL) for 130 MW.

The main dam structure is a 177 meter high Rolled Compressed Concrete dam with a gated crest spillway.

The powerhouse is located on the left bank of the river 450 meters downstream from the dam structure and has 3 turbine-generator Francis units (2x260 MW for EGAT and 1x130 MW for EDL).

For EDL offtake, a 115 KV transmission line will take power 9 km to the Paksan-Khonsong substation. For EGAT offtake, a 500 KV transmission line takes power 154 km to Nabong substation in Laos for re-transmission to Thailand.

The electrical transmission infrastructure at the project site includes transformers, low and medium-voltage switchgears and a 500 kV gas-insulated substation (GIS).

Nam Theun 1 switchyard image below:





A diversion tunnel located on the right bank will allow dry season floods of the Nam Kading to pass safely. Allowance is also made for safe overflow during the rainy season of the main dam and the two cofferdams.

An intake structure located above the dam takes water down a headrace tunnel (11 meters in diameter) to the powerhouse. The bifurcated headrace tunnel is a reinforced concrete lining type with 565 meters length for the EDL Shaft and 544 meters length for the EGAT Shaft.

Full reservoir capacity is about 3 billion cubic meters with 2 billion of that as active storage. Normal reservoir water surface level is 292 meters above mean sea level.

The project also involved the construction of two cofferdams.

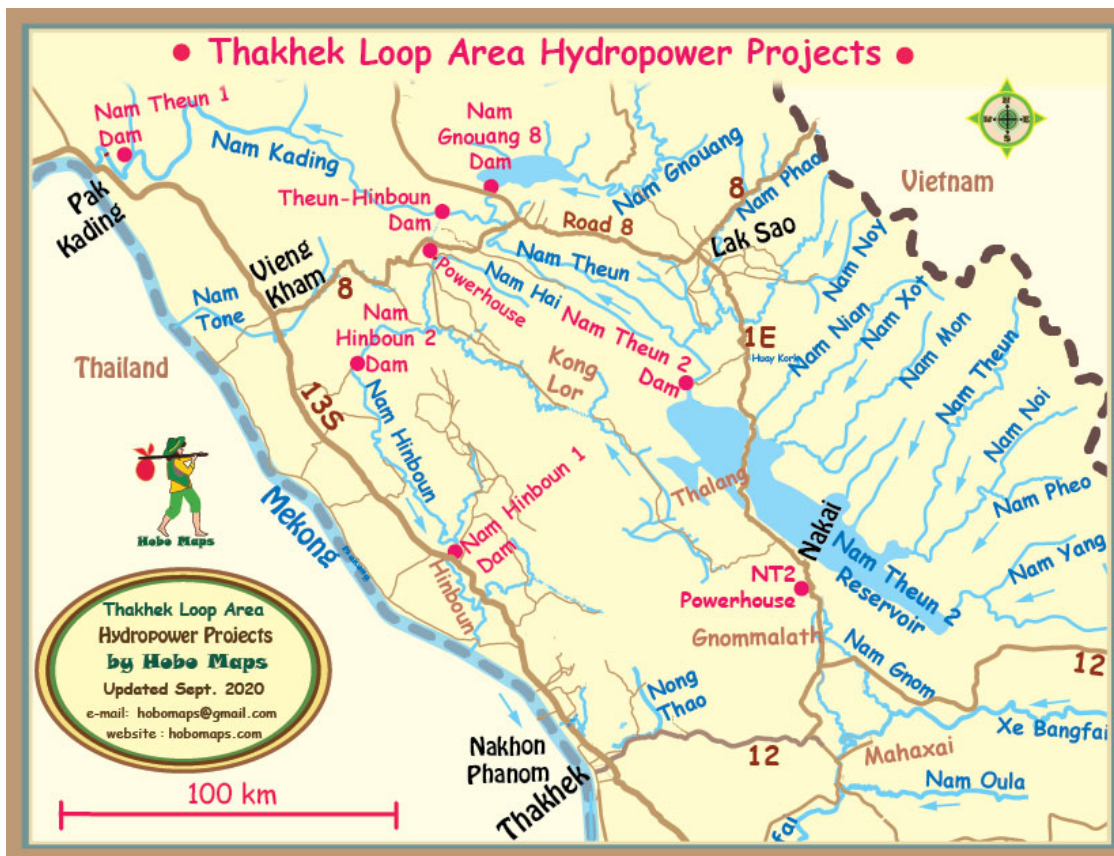
Nam Theun 1 site image below during construction at coordinates 18°21'25.2"N 104°08'52.8"E (18.357, 104.148)



The Nam Theun 1 hydroelectric power plant operates at a water head of about 140 meters.

The project involves a diversion channel, a headrace tunnel connected to 10 meter-diameter steel penstock, a spillway and a tailrace channel.

Map below shows Nam Theun 1 Dam Hydropower project in upper left near Pak Kading:



**Nam Theun 1 Hydropower Project Details below:**

Project Cost	\$1,335 Million	Catchment Area	13,856 Km <sup>2</sup>
Shareholder	PSG 32%, CSE 28%, EGCO 25%, EDL-GEN 15%	Annual Average Rain Fall	2,496 mm
Installed Capacity	650 MW	Annual Average Discharge	317 m <sup>3</sup> /s
Average Annual Energy		Reservoir Storage	3,009 Million m <sup>3</sup>
Maximum Turbine	513.7 m <sup>3</sup> /s	Capacity	
Discharge		Reservoir Surface Area	93.6 Km <sup>2</sup>
Rated Head		Full Supply Level	292 m a.s.l
Turbine Type	Vertical Axis Francis	Minimum Operating Level	250 m a.s.l
Offtaker	EGAT/EDL		

Main Dam		Spillway	
Type	RCC Curve Gravity Dam	Type	Gate controlled overflow ogee
height	177 m	Number of Gate	6
Crest width	8 m	Design Flood Discharge	4860 m <sup>3</sup> /s
Crest Length	771 m	Max. inflow peak	9745 m <sup>3</sup> /s
Crest Level	297m asl		
Diversion Channel		Headrace Tunnel	
Type	Single tunnel (plus Overtop cofferdam)	Type	Single tunnel (concrete and steel lining)
Length	932 m	Diameter	11 m
Tunnel Diameter	11 m	Length	917 m
Longitudinal Gradient	0.7 %		
Penstock		Tailrace Channel	
Type	Pressure tunnel	Type	Tunnel and open channel
Number of Pipe	1 line	Width	10.8m ~ 15m
Diameter	11.40m	Length	44m ~ 40m in tunnel section
Length	565 m (EDL) / 544 m (EGAT)	Height	10m in tunnel
		Switchyard 500kV GIS (EGAT)/115 kV AIS (EDL)	
		Type	Conventional switchyard
		Dimension	11.4m wide x 26m long



Powerhouse		115KV Transmission Line EDL	
Type	Pit Powerhouse, 2 pits	Substation	Pakxan-Khonsong
Installed Capacity	650 MW	Length	9 Km
Number of Unit	3	Circuit Type	7.5 Km Double Circuit; 1.5 Km Single Circuit
Turbine Type	Vertical Axis Francis	Conductor Size	795 MCM
Max Powerhouse Discharge	513.7 m <sup>3</sup> /s	500KV Transmission Line EGAT	
Erection Floor Elevation	25.8m wide x 91.10m long x 14.80m high	Substation	Nabong
		Length	154 Km
		Circuit Type	ACSR/GA
		Conductor Size	795 MCM

The Nam Theun 1 reservoir gets its water from the very large and wet 14,000 square km Nam Theun-Nam Kading catchment basin. Both the Nam Theun 2 Hydropower Project and Theun-Hinboun Hydropower Project further upstream on the Nam Theun divert water out from this basin into another basin which in effect decreases the flow that otherwise would have come into the Nam Theun 1 reservoir resulting in less available for power generation by Nam Theun 1.

See our [Map of the area's basins and drainage](#) .

#### Contractors involved in the Nam Theun 1 hydropower project

Italian-based Cooperativa Muratori e Cementisti together with Italian-Thai Development Public Company and Vietnamese state-owned Song Da Corporation were contracted for civil and hydro-mechanical works of the project.

Song Da Corporation's work included blasting, excavation and transportation of soil and rock as well as construction of the crushing and batching plant and the cofferdams for the project.

Italian-based ATB Riva Calzoni supplied the penstocks, bottom outlet and other hydro-mechanical equipment.

China's state-owned Sinohydro Bureau 3 was engaged in civil works for the project.

Vienna-based Andritz Hydro supplied electro-mechanical equipment including turbines and generators for the plant.

Pöyry (now Afry) was engaged as the owner's engineer.

Italian-based Simen provided the concrete batching plant while NMS Industries provided the sand and gravel processing system.

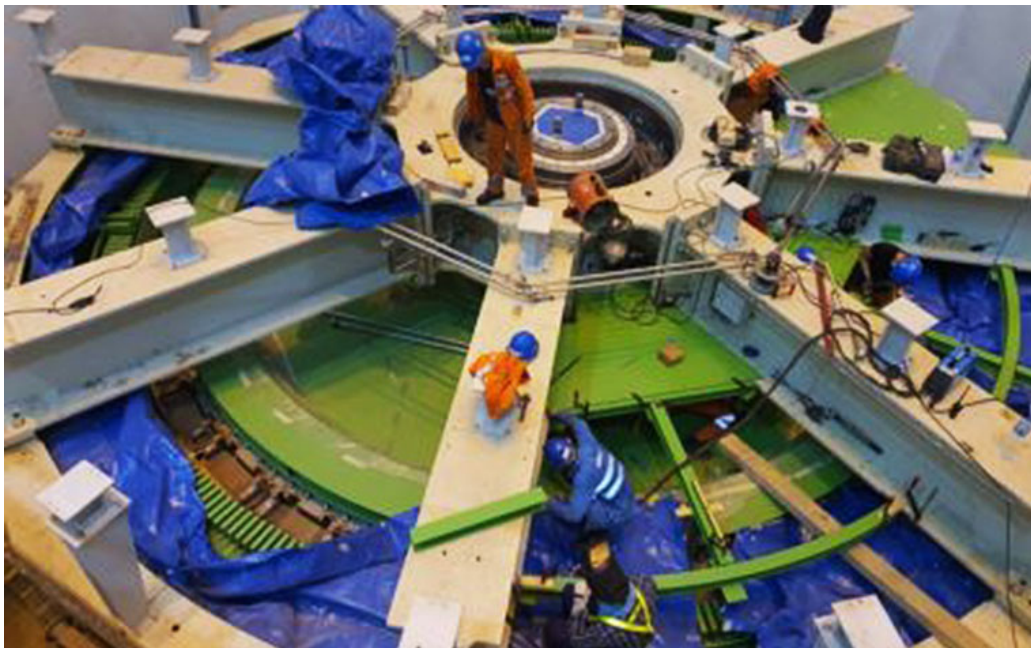
Thai-based Right Tunnelling handled the underground excavation and concrete lining works for the project.

Nam Theun 1 construction in progress images below:













Project history below from CS Energy website Nov. 2021:

1. On March 09, 2012 Signed a Memorandum of Understanding (MOU) with the Government of Lao PDR
2. Project Development Agreement (PDA) signed on September 09, 2014
3. Completed the report of Environmental and Social Impact Assessment on September 16, 2014
4. Completed the Environmental and Social Management and Monitoring Plans on September 16, 2014
5. Feasibility study of the project was approved on February 22, 2016
6. Signed a concession agreement with the Government of Lao PDR on June 14, 2016
7. On September 23, 2017, a power purchase agreement was signed with the Electricity Generating Authority of Thailand (EGAT).
8. Completed the Environmental and Social Management and Monitoring Plans construction Phase on June 19, 2018.
9. Reservoir impounding began in June 2021.