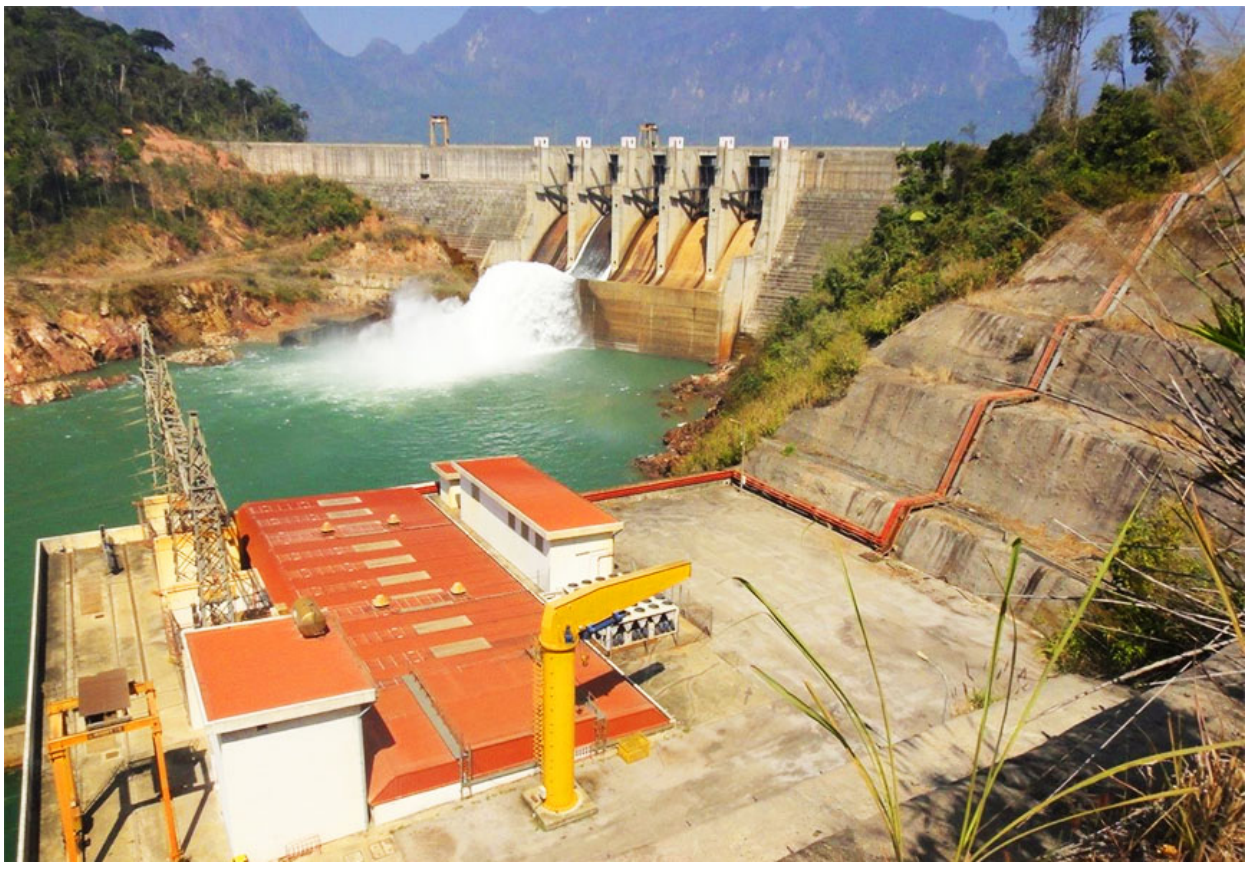
Theun-Hinboun Dam Hydropower Info by Hobo Maps - Go to Hydropower Projects Page - - - **Home**

The first hydropower plant of the Theun Hinboun Power Company (THPC) is located in both Bolikhamxay and Kammouane Provinces in Lao PDR with commercial operation started in 1998 under a 30-year BOT "build–operate–transfer" agreement with option for a 10 year extension. After the concession period the plant reverts to the Lao government.

Theun-Hinboun original weir and head pond images below at coordinates 18°15'39.6"N 104°33'43.2"E (18.261, 104.562):

Images for Theun-Hinboun Expansion dam on Nam Gnouang below at coordinates 18°17'45.6"N 104°38'09.6"E (18.296, 104.636):



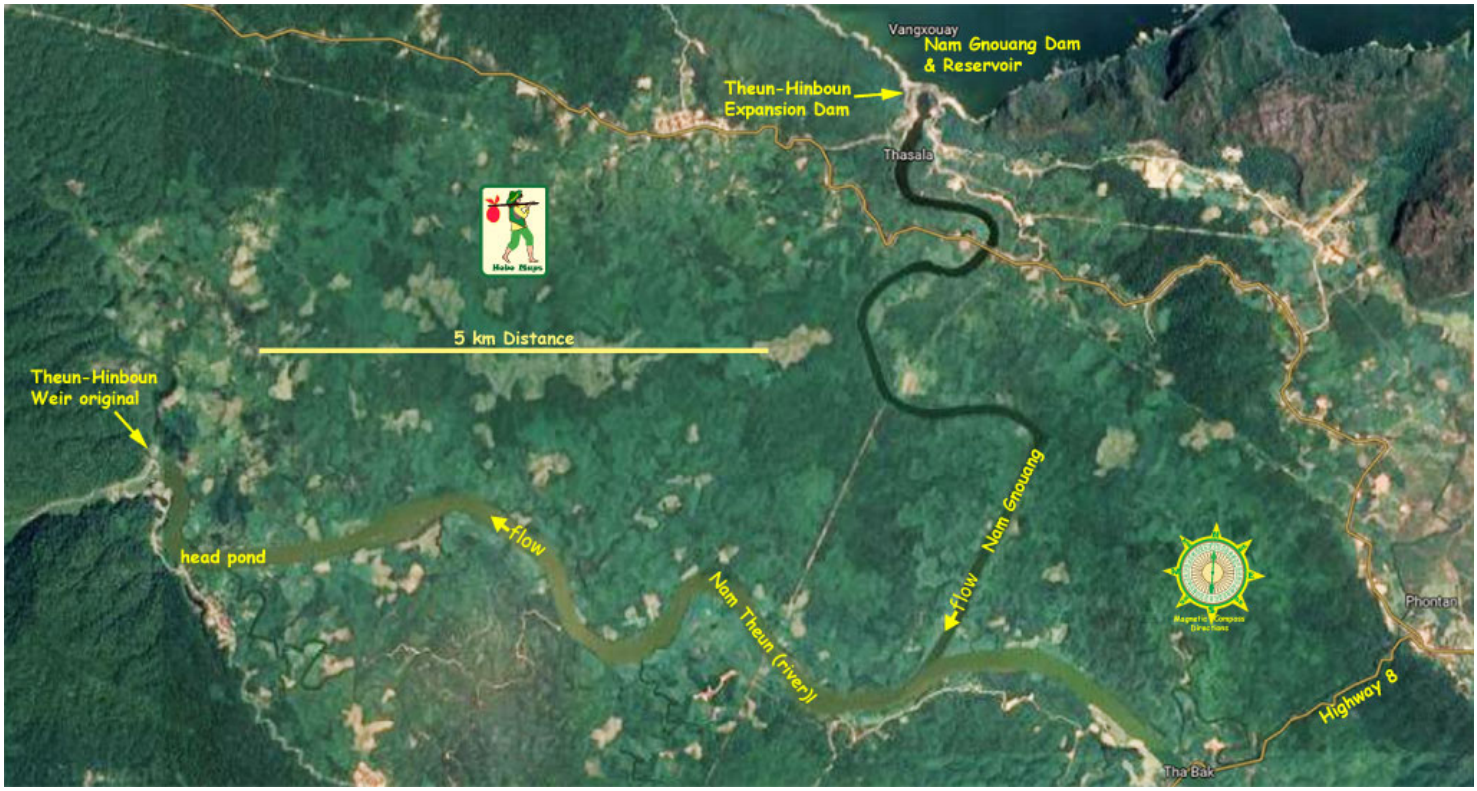
The Project is located about 100 km upstream from where the Nam Kading (river) joins the Mekong near Pak Kading.

Theun Hinboun Power Company is owned by Electricité du Laos (EDL GEN) as the 60% major shareholder with the remaining shares evenly distributed between Norwegian Statkraft SF and GMS Lao Company Limited.

The run-of-river project has a capacity of 220 MW and can generate up to 1,100 GWh per year, 95% of which is to be purchased by Electricity Generating Authority of Thailand (EGAT).

A weir style dam was created to hold back water in a head pond on the Nam Theun (river). Two underground tunnels carry water from the head pond down to a power station located in Na Hin town far below.

Satellite image below shows both dams - original weir and expansion dam:



Satellite image below shows Na Hin town and powerhouse:

The initial project is a 220 MW trans-basin water diversion project that cost $260 million to construct. Asian Development Bank (ADB) loaned $60 million to implement this first joint-venture hydropower project with foreign investors.

The Theun Hinboun hydropower project is considered a commercial success and has yielded good dividends over the first decade. Royalties of five percent are paid to the Ministry of Finance and dividends to the state.

Theun-Hinboun Powerhouse images below at coordinates - 18°12'36.6"N 104°32'19.6"E 18.210176, 104.538788:

After a decade of operation it was decided to expand the project to a new total capacity of 500 MW by capturing and regulating the water of the Nam Gnouang (river) which is one of the tributaries to the existing project. A total of 440 MW is be sold to EGAT and the remaining 60 MW sold to Electricité du Lao (EDL).

The new Nam Gnouang dam, 20 kilometers upstream from the existing Theun-Hinboun Weir Dam, created a reservoir to regulate river flows into the Theun-Hinboun headpond which will increase power output in the dry season. The expansion also included a 900-meter long penstock and transmission line.

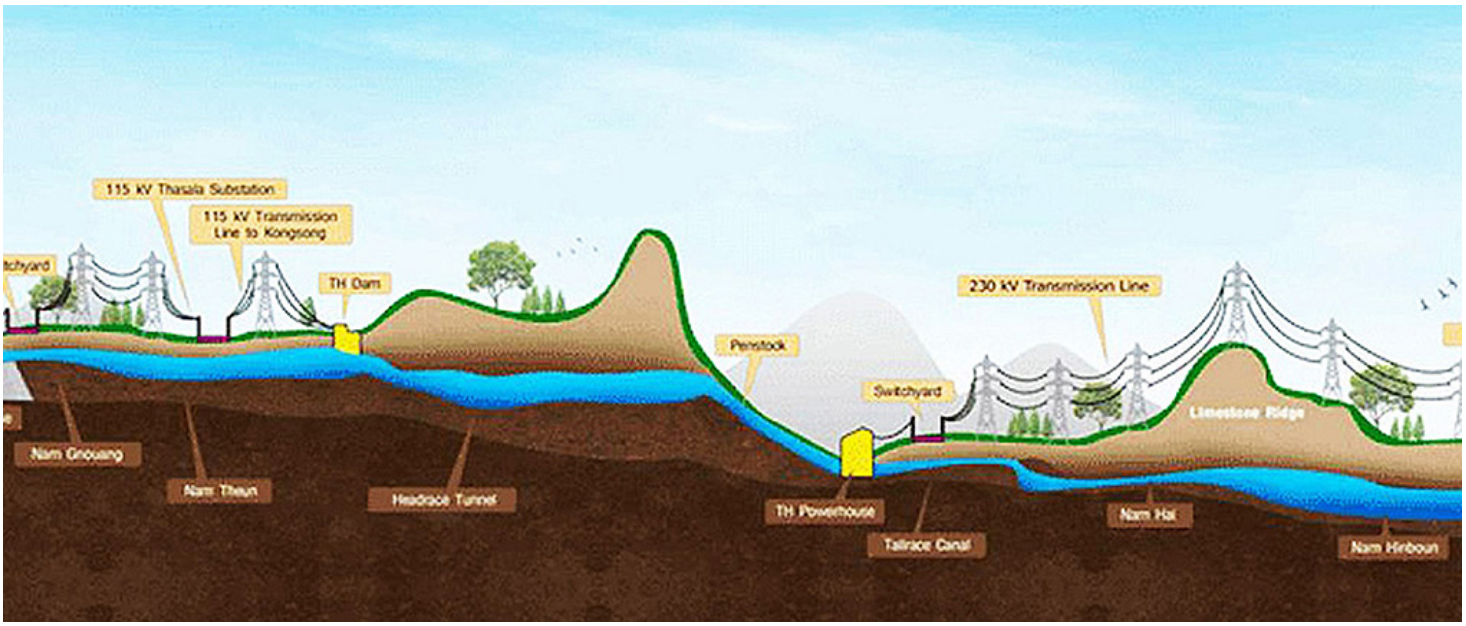
The Nam Gnouang Dam structure is 480 meters wide and 65 meters high and created the Nam Gnouang Reservoir which stores the rains from the May-October rainy season each year. The dam has five gates that are opened only to discharge water to avoid flood events during the wet season. In normal operation the dam releases water through the Nam Gnouang Powerhouse which generates up to 60 MW of electricity for domestic supply to Electricité du Laos (EDL).

Images for Nam Gnouang reservoir and intake structure below:

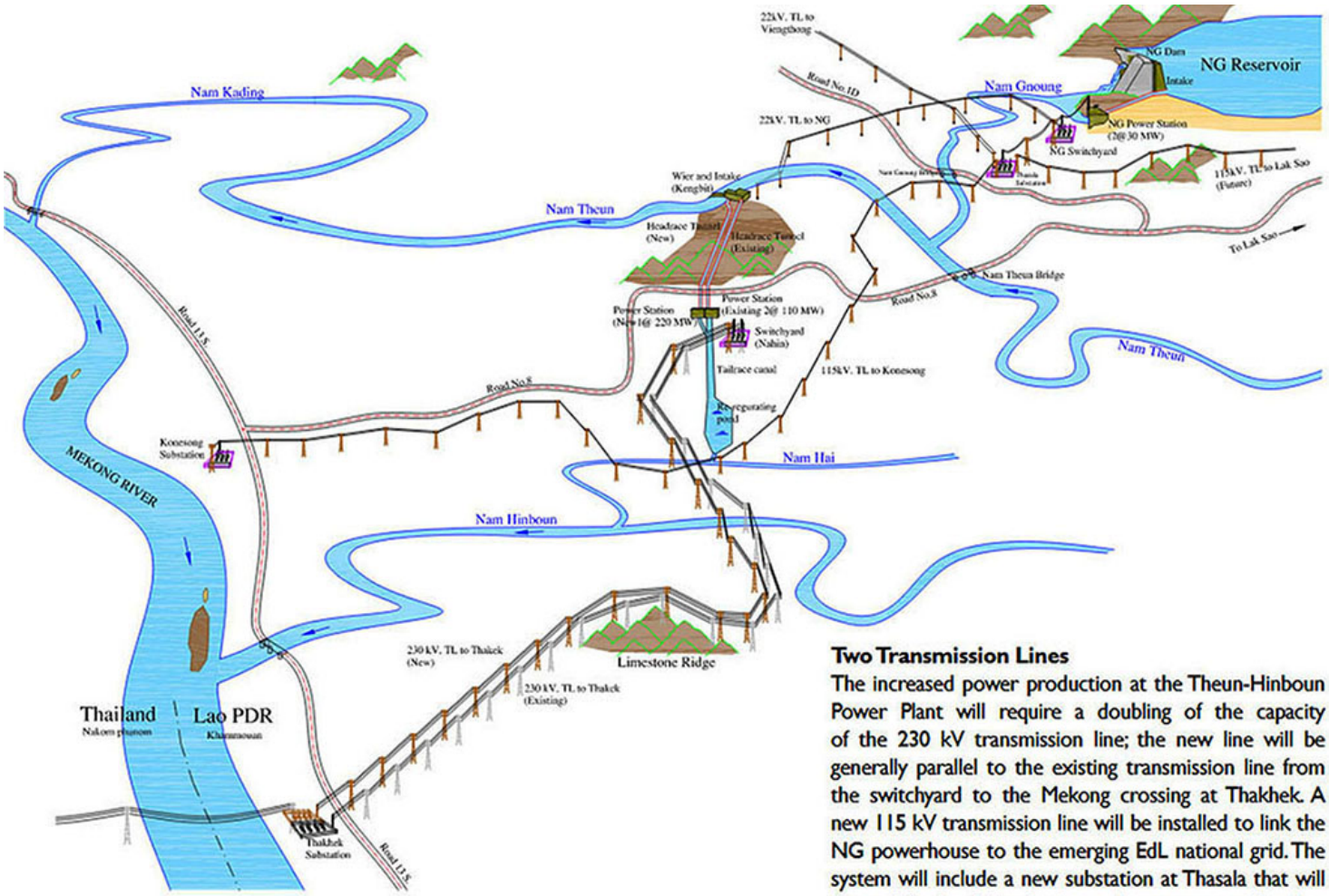
From the Nam Gnouang Powerhouse the water flows into the Nam Theun (river) and into the existing head pond above the original Theun-Hinboun Weir/Dam. A new intake and tunnel system channels water to an expanded Theun-Hinboun Powerhouse 240 meters in elevation below in Na Hin town in the Khounkham valley. There a new 220 MW Francis Unit generator operates alongside the existing two 110-MW turbines. These give Theun Hinboun Power Company an export capacity of 440 MW which is sold to Thailand through two 230 kV transmission lines. The total combined generating capacity is now 500 MW with much of the water from the new Nam Gnouang reservoir used to generate power twice.

The water released from the Na Hin powerhouse flows to a spillway and into a regulating reservoir before final release into the Nam Hai (river), a tributary of Nam Hinboun.

Theun-Hinboun Hydropower Project layout in image below after the expansion project:



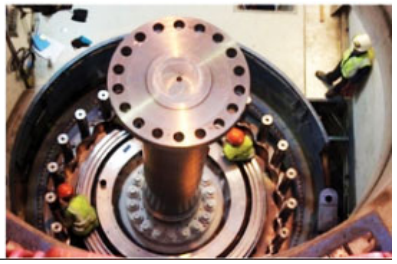
Theun-Hinboun Layout below:



Two Transmission Lines

The increased power production at the Theun-Hinboun Power Plant will require a doubling of the capacity of the 230 kV transmission line; the new line will be generally parallel to the existing transmission line from the switchyard to the Mekong crossing at Thakhek. A new 115 kV transmission line will be installed to link the NG powerhouse to the emerging EdL national grid. The system will include a new substation at Thasala that will be used for local distribution and to connect with other projects proposed in the region.

Images below show upgrade of facilities project adding an additional 20 MW capacity:



Powerhouse interior image below:

Theun-Hinboun Control Room 1 image below:

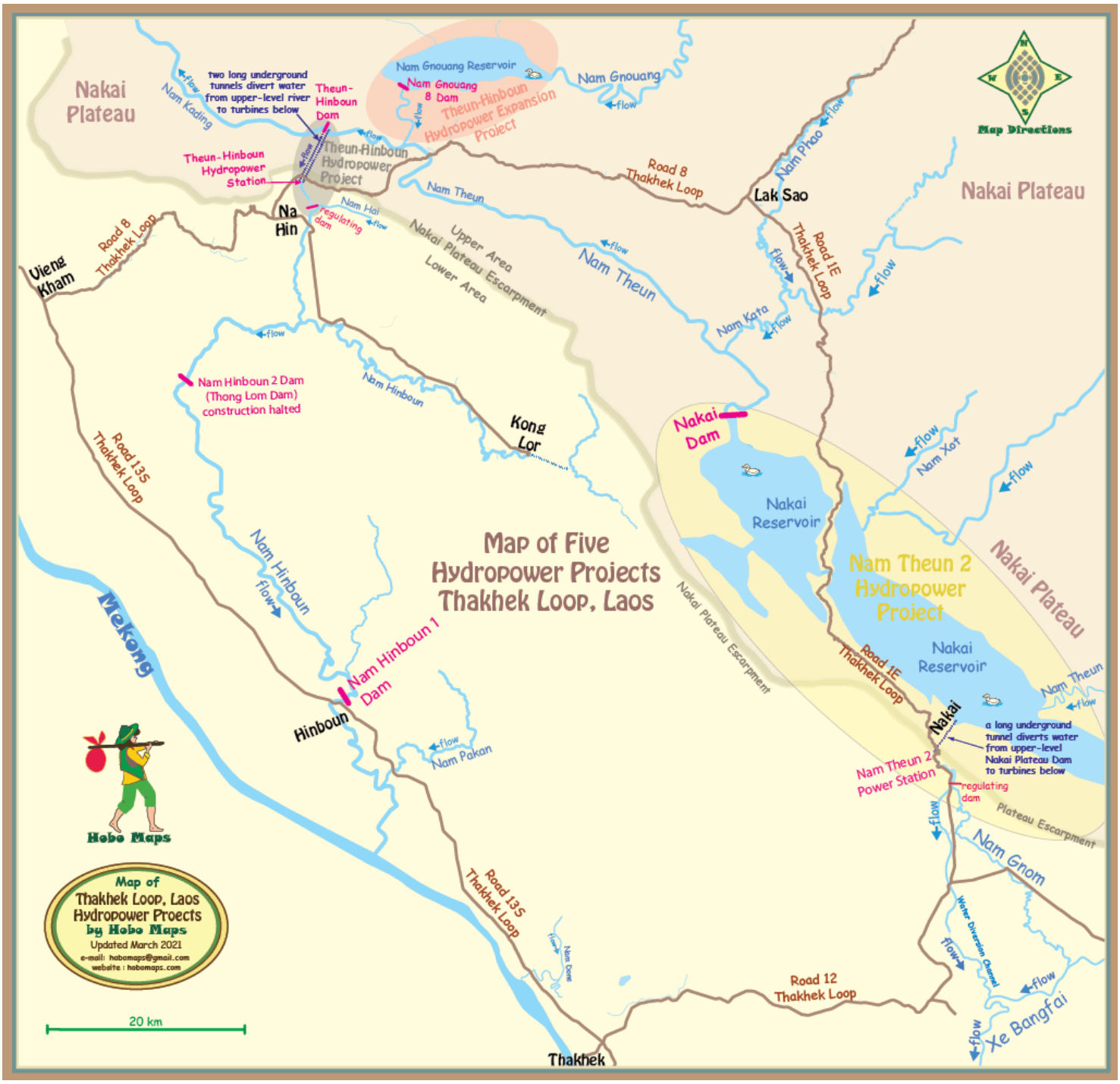
Three different styles of generators and a rotor at Theun-Hinboun shown below:

Image below is view over powerhouse eastward towards Kong Lor Cave area.

Theun-Hinboun Switchyard 1 image below:

Theun-Hinboun Switchyard 2 image below:

Location map below shows Theun-Hinboun Projects at the top in gray and pink ovals:



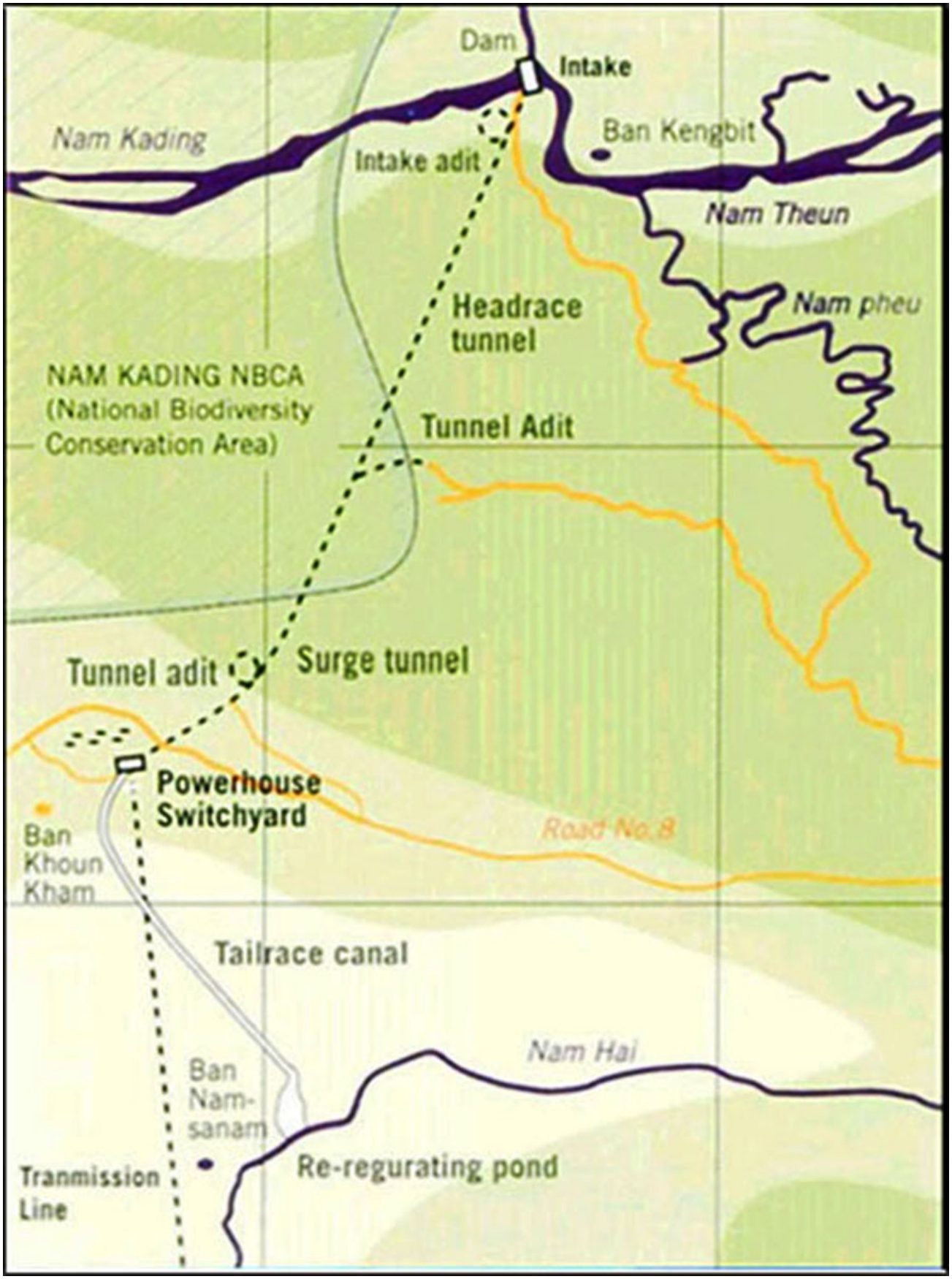
See our map of Nam Theun Basin and Nam Hinboun Basin water drainage and catchment areas HERE

Table 1.1: Summary of river basins features

Features	Basins		
	Nam Theun/Nam Kading	Nam Hinboun	Xe Bang Fai
Physical features			
Catchment area	14,813 sq. Km (6.25% of national area)	2,529 sq. Km (1.06% of national area)	10,345 sq. Km (4.36% of national area)
Length	353 Km	About 89 Km	About 209 Km
Elevation	Min.: 145 masl (at Kading River mouth) Max.: 2,288 masl (Phou Lao Kai, Khamkeut district)	Min.: 138 masl (at Hinboun River mouth) Max.: over 2,000 masl (at mountains)	
Annual rainfall	Min.: 1,739 mm (at Ban Namoew) Avg.: 2,500 mm Max.: 2,979 mm (Ban Nakai Tai)	Avg.: 2,646 mm (CS11 station @ Nam Hai_2008-2011) Avg.: 1,811 mm (CS16 station @ Nam Hinboun_2009-2011) Avg.: 1,746 mm (CS20 station @ Nam Hinboun_2009-2010)	Avg.: 2,646 mm (at Mahaxai_1989-2002) Avg.: 2,224 mm (at Gnommalati_1994-2002)
Water resources			
Average flow to Mekong River	17,219 x 10^6 m^3/year		16,493 x 10^6 m^3/year
Average discharge	546 m^3/second	147.64 m^3/second (CS10 station @ Nam Hinboun_2007-2011) 86.49 m^3/second (CS11 station @ Nam Hai_2007-2011) 51.13 m^3/second (CS10 station @ Nam Hinboun_2008-2011)	523 m^3/second
Annual	7,641.03 x 10^6 m^3/year:		

Theun-Hinboun tunnel-boring machine breakthrough image below after nine months of boring 6.9 meter diameter tunnel from intake pond to powerhouse.

Theun-Hinboun tunnel diagram below:


Dam
Intake
Nam Kading
Ban Kengbit
Intake adit
Nam Theun
Nam pheu
Headrace tunnel
NAM KADING NBCA
(National Biodiversity Conservation Area)
Tunnel Adit
Tunnel adit
Surge tunnel
Powerhouse
Switchyard
Ban Khoun Kham
Road No.8
Tailrace canal
Nam Hai
Ban Nam-sanam
Re-regurating pond
Tranmission Line

TH Dam and Powerhouse

Province	Khammouane
River	Nam Theun
Drainage areas	4,903 km^2
Average annual precipitation, power station	4,000 mm
Average annual flow	180 m^3/s
Reservoir full supply level	398.64 masl
Headrace tunnel (machine-bored) length and diameter	5,300 m; 6.9 m*
Surge tunnel, length and diameter	950 m; 5.6 m*
Penstock (Underground), length and diameter	840 m; 5- 5.8*m
Power station type	Surface
Gross head	235 m*
Plant design flow	110 m^3/s*
Turbine type (2 x 120 mw; 1 x 220 mw)	Vertical Axis Francis
Turbine inlet valve (spherical), diameter	3.1 m*
Transmission line to Thakek Substation, rating, length	230 kV, 82 km

Nam Gnouang Reservoir, Dam and Powerhouse

Province	Bolikhamxay
Catchment area	2,942 km^2
Average annual precipitation at Powerhouse	1,500 mm
Average annual flow	95.1 m^3/s
Reservoir area	105 km^2
Reservoir full supply level (FSL)	455 masl
Reservoir low supply level (LSL)	420 masl
Dam height	65 m
Dam crest length	480 m
Dam concrete volume	480,000 m^3
Type of spillways	Gated Ogee
Powerhouse type	Surface
Gross head	56 m
Turbine type (2 units)	Vertical Axis Francis
Plant capacity	60 MW

NG Dam and Powerhouse

Reservoir Full Supply Level	455 metres above sea level
Max Effective Storage Volume	2,262 million cubic metres
Roller Compacted Concrete Dam	65 m high (upstream face); 480 m long
Dam Discharge Capacity	10,700 m^3 (five radial gates)
Net Head	47 m
Turbines	2 x 30-MW Francis Units: 60 MW for domestic use

TH Dam and Powerhouse

Reservoir Full Supply Level	400 metres above sea level
Reservoir Operating Volume	29 million m^3
Net Head	230 m
Concrete Gravity Free-Overflow Weir	27 m high; 330 m long (weir and gates combined)
Two Concrete-Lined Headrace Tunnels	Length: 5,289 m and 5,496 m
Turbines	two 120-MW Francis Units (original project - turbines one 220-MW Francis Unit (expansion project)

440 MW of Theun-Hinboun's output is for export to Thailand by the route shown in map below:

Theun Hinboun Expansion reservoir image below as of Oct. 2022 at end of rainy season: