

Nam Ngum 3 Hydroelectric Power Project

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Project Type :	Location :	Capacity :	Construction Started :
Run-of-the-river hydroelectric power generation facility	Nam Ngum River, Longcheng, Xaysomboun, Laos	480MW	November 2015

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The Nam Ngum 3 is a Chinese-funded 480MW hydroelectric power project (HPP) under construction in the Xiangkhouang province of Laos.

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Nam Ngum 3 (NNS) Power Company, a special purpose company formed by Electricite Du Laos

(EDL, 20%), China Xiangkhouang Power Construction Co., Ltd. (CXPC) and EGAT (EGATi, 25%) is the owner and developer of the project.

Estimated to cost approximately £1bn (\$1.4bn), the Nam Ngum 3 hydropower project is being executed by Chinese contractors as it is considered a key project under China's Belt and Road Initiative (BRI).

The construction works on the project were started in November 2015 with commissioning expected by 2022.

PROJECT GALLERY

Upon completion, the Nam Ngum 3 hydropower facility is estimated to generate approximately 2.345 billion kilowatt-hours of electricity annually.

Location and site details

The Nam Ngum 3 hydroelectric power project (<https://www.nsenerybusiness.com/projects/souapiti-hydropower-station/>) is being developed on the Nam Ngum River, a tributary of the Mekong River, in Longcheng, Xaysomboun, Laos, approximately 200km away from the capital Vientiane.

The project site lies upstream of the existing Nam Ngum 1 (151MW) and Nam Ngum 2 (615MW) hydroelectric power plants, and downstream of the 240MW Nam Ngum 4 (under construction) project and the operating Nam Ngum 5 (120MW) HPP.

Nam Ngum III plant make-up

The Nam Ngum III hydropower project will comprise a concrete faced rock dam (CFRD) and a ground powerhouse measuring 78.5m-long, 60.95m-high, and 22.5m-wide on the right bank of the river.

The plant will be equipped with three 160MW vertical Francis turbine-generator units, designed to operate at a maximum head of 340m.

The water diversion system includes a 10.5km-long reinforced concrete headrace tunnel with a discharge capacity of 180m³/s, a 240m-high surge shaft with an inner diameter of 15m, and a 1623m-long pressure shaft.

The electrical components will include three sets of 200MVA air-cooled transformers along with ancillary equipment, circuit breaker cabinets, 24kV high voltage switchgear, and a 115 kV gas-insulated switchyard.

Dam and reservoir details

The main dam for the project will be a 212m-high concrete hyperbolic arch dam with a crest length of 395m and a crest width of 10m. It will create a reservoir with a storage capacity of up to 1.411 billion cubic metres (bcm) covering a surface area of approximately 27.5km².

The dam will feature a spillway on the left bank which will comprise three radial gates measuring 14.5m-wide and 18m-high, with a design discharge capacity of 4860m³/s.

Power evacuation

The electricity generated by the Nam Ngum 3 hydroelectric power plant will be evacuated through a 110km-long, double-circuit 230kV power transmission line connected to the Ban Naphia substation.

Contractors involved

Sinohydro International Engineering Company signed an engineering, procurement, and construction (EPC) contract for the development of the Nam Ngum 3 hydroelectric power project in 2013.

China Hydropower Construction International Engineering, and China Water Resources, and the Tenth Bureau of Hydropower were subcontracted for the construction works of the project.

Zhefu Company was contracted for the manufacturing and supply of the main hydraulic equipment for the project, while Sichaun Ertan International Engineering Consulting Company was engaged by Sinohydro to provide supervision services.

East Asia Investment and Construction Consultant has been engaged as the owner's engineer and construction supervision contractor.

Right Tunnelling Company is responsible for the construction supervision of the headrace tunnel, dam grouting, and slope protection works.

Artelia France was engaged to provide the project owner's consultancy services, while Northwest Survey and Design Research Institute was engaged in the design and engineering works of the project.

Nari Group Corporation procured the dam measuring instruments while Siam Tone Company was responsible for the installation of the instruments.

Sichuan Tuojiang Crane Company was subcontracted by the Tenth Bureau of Hydropower for the procurement of the gantry crane, while Yiante Construction provided formworks for the spillway construction activities.

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