

Source: The Kathmandu Post, April 27, 2019

Studies to begin for two storage-type hydro projects

- *Khimti Those Siwalaya project has an installed capacity of 326 MW and Bharbung project has a capacity to produce 512 MW*

- PRAHLAD RIJAL, Kathmandu

The Department of Electricity Development has started work to develop two storage-type hydropower projects with a combined capacity of 838 MW, one on the Khimti River on the border between Dolakha and Ramechhap districts and the other on the Bharbung River in Dolpa, in line with the government's strategy to generate 5,000 MW of electricity within five years.

The department has invited expressions of interest to carry out feasibility and environmental impact studies for these two schemes. The first project, Khimti Those Siwalaya Storage Hydropower Project located in Dolakha and Ramechhap has an installed capacity of 326 MW. The second project, Bharbung Storage Project, is located in Dolpa and has a capacity to produce 512 MW.

“The government's priority is to construct storage-type hydropower projects as they are used to supply uninterrupted power during the dry seasons,” said a department official. “We have invited bids to prepare the feasibility studies for these projects after getting the necessary funding assurance from the government.”

The selected consulting firms are expected to start work in September, and they are required to complete the feasibility and environment impact assessment report for the Khimti Those Siwalaya project within 30 months and for the Bharbung project within 36 months from that date. The government prioritised the two reservoir projects citing the need to increase power generation in the dry season under its plan and policy for this fiscal year.

The proposed Khimti Those Siwalaya Hydropower Project will utilise the waters of the Khimti River, a major tributary of the Tamakoshi River, that lies on the border between Dolakha and Ramechhap districts. The project has identified two potential sites for the powerhouse. The plant

is expected to operate during the dry season from December to May and generate electricity for 6 hours daily. Production will peak at 310 MW in January. As per a preliminary study, the Khimti reservoir will hold 633 cubic megametres of water.

According to the department, the Khimti Those Siwalaya Hydropower Project could impact two nearby projects—Khimti I Hydropower Project (60 MW) constructed by Himal Power Company, and the Khimti II Hydropower Project (48 MW) being developed by Peoples' Hydro Company. Another 7 MW project being developed by Himalayan Urja Company also faces the threat of inundation.

“The feasibility study will tell us what impact the proposed Khimti Those Siwalaya Hydropower Project will

have on these three projects,” said officials.

The proposed 512 MW Bharbung Storage Hydropower Project in Dolpa is expected to be built with an auxiliary 10 MW run-of-the-river scheme on the Tatu River after diverting water to the Bharbung reservoir. The Bharbung River is a snow-fed river that flows down from Mt Dhaulagiri. The Bharbung plant is expected to operate for 7-8 hours daily.

The department said that the consultants would be required to submit separate reports of the feasibility study and the environmental impact assessment. They will need to show detailed field surveys, investigation and economic and financial analysis as well as possible benefits from fishery development and tourism, officials said.

The Nepal Electricity Authority has revived the 828 MW Uttar Ganga Hydroelectric Project which is also a storage-type project and has invited expressions of interest for consulting services to prepare a detailed engineering design and bidding documents.

Source: Urja Khabar, April 28, 2019

Who will buy Nepal's hydropower?

Acute energy shortages has been one of South Asia's major challenges. And given the distribution of natural resources, regional electricity trade has long been touted as the obvious solution. This has been a hot topic at regional forums in South Asia including the South Asian Association for Regional Cooperation (SAARC) and the Bangladesh, Bhutan, India, Nepal Initiative (BBIN).

Nepal's domestic debate

Opinion is split on how Nepal should develop its hydropower resources. Some advocate that Nepal should harness as much of its potential 83,000 Megawatts (MW) of hydropower for local use, and export the surplus to other countries to generate revenue. Others argue that Nepal should only harness enough electricity for its own consumption and avoid exporting power since the environmental costs and risks of hydropower are so high.

The Nepal government's white paper on the energy, water resources and irrigation sector aims to increase production capacity to 15,000MW. The current peak load electricity demand of Nepal is around 1,500 MW, according to the Nepal Electricity Authority (NEA). This is expected to increase to 2,379 MW by 2022 and 4,280 MW by 2030 in a business-as-usual scenario. But if there is reliable electricity for 24 hours per day then peak electricity demand would reach 2,744 MW by 2022 and 5,371 MW by 2030.

In addition, around 95% of households in Nepal have access to electricity, out of which around 60% of households are connected to the grid, 10% by community rural electrification schemes, 18% by off-grid electrification schemes and 7% by stand-alone solar systems. The increase in household energy demand under surplus energy scenario is yet to be explored but we can assume that it won't skyrocket. However, it will take more than a decade for all the households to have access and consume around 1,250 kWh annual per capita.

In the past Nepal has suffered severe electricity shortages with almost 18 hours of power cuts during the winter season when river flows are low. Now, after importing around 300 MW from India, at least the city areas are not facing long power cuts. However, industries and rural areas still face power cuts. Hydropower projects currently under construction are expected to add 3,000 MW by 2020 and soon Nepal will be able to become an energy surplus country. Nepal should then seek to export its surplus energy. But is Nepal's hydroelectricity still lucrative enough to export to its power hungry neighbours?

Shifting energy demand in South Asia

In Bangladesh, 90% of population had access to electricity in 2017/18. Present installed power generation capacity is around 15,300 MW and 660 MW is imported from India. The government plans to expand its capacity to around 24,000 MW by 2021. Demand is expected to reach up to 50,000 MW by 2040 under a business-as-usual scenario. Natural gas is the major source of electricity generation in Bangladesh, accounting for around 61% of power is generated. The rapid depletion of natural gas is one of the biggest challenges for Bangladesh's energy sector. Bangladesh needs to diversify its source for power generation by increasing the share of renewable energy and decreasing share of natural gas. But instead Bangladesh plans to build a large number of [coal plants](#).

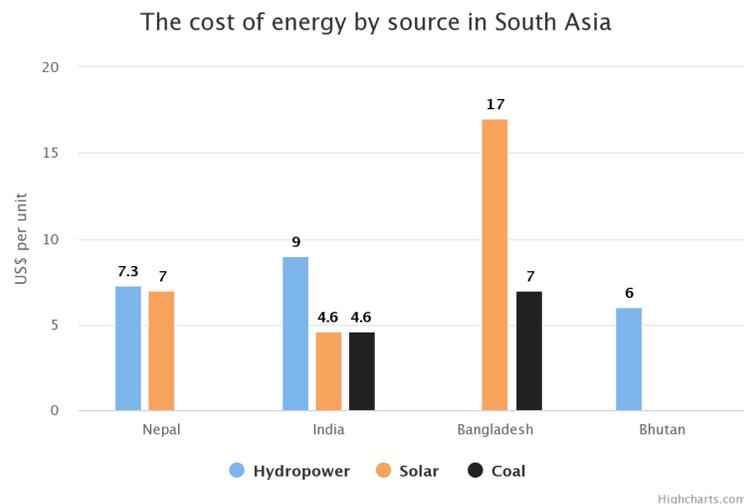
In 2017, India's peak electricity demand was 162 GW, and it is expected to reach 226 GW and 299 GW by 2022 and 2027 respectively. The peak power demand in Indian states sharing a border with Nepal (Bihar, Uttar Pradesh and Uttarakhand) was 21 GW in 2017 and is expected to increase by 33 GW in 2022 and 45G W in 2027. India plans to increase power generation from renewables by 175 GW by 2022, which would make the energy mix 50% from renewable energy, and 50% from conventional sources.

India's energy demand forecasts are overestimated, in contrast to Nepal and Bangladesh where forecasts are underestimated. The overestimation of 30-40% over the past two decades has led India to experience a 1.1% energy surplus and 2.6% peak energy surplus. India's energy production increased by over 240% during the last decade; 87 GW of thermal capacity was commissioned in just five years from 2012 to 2017. Bihar and Uttar

Pradesh, Indian states bordering Nepal, are yet to be 100% electrified but ongoing rapid installation of power plants and aggressive rural electrification expansion activities will soon help them achieve this. India's has almost achieved its target for universal energy access. Though controversial, [Indian Prime Minister Narendra Modi claimed](#) that all the villages in India are electrified. Even if this ignores some details, they are like to be soon electrified under the rural electrification scheme.

Hydropower – the uneconomical option

On the other hand, the power distribution companies in India are operating at a loss. There have been several government bailouts to clean up their finances over the past two decades. For the distribution companies, the surplus power means no more additional power is required. Even if they need power, they will the seek cheapest options i.e. either coal or solar. For hydropower, the estimated average cost per kilowatt-hour (kWh) in India is around 9 cents, compared to 7 cents in Nepal, and 6 cents in Bhutan. Coal and solar are much cheaper in India; it is only 4.6 cents per unit, almost half the cost of electricity generated by hydropower. For Bangladesh, the average the per unit energy generation cost from coal is around 7 cents.



(Data source: estimated costs from Aditya Valiathan, S. Parsai, 2018)

The cost of power generation in India is much lower than in Nepal and Bangladesh. Even the production cost of renewable energy such as solar is lower in India. It is clear that

from the Indian perspective it makes no economic sense to buy Nepal's hydropower. For Bangladesh, investing in Nepal's hydropower doesn't look price competitive, but it will support the long term strategy of increasing the clean energy mix. However, Nepal alone cannot sell electricity to Bangladesh. It will need to sign an agreement to use India's distribution system or to sell it to India and then to Bangladesh. Nevertheless, Nepal and Bangladesh has already signed a memorandum of understanding (MoU) for power exchange cooperation. But whether it can be implemented all depends on India.

A better way forward

It is clear that even under the high economic growth scenario Nepal won't be able to consume 10,000 MW in the next decade and India's rapid power generation plan and low cost renewables are making the Nepal's hydropower less attractive in the region. Even if an MoU for regional energy trade is implemented in the near future, Nepal's hydropower may not be attractive to the regional market as the cost of electricity is higher in Nepal compared to the India and Bangladesh. On the other hand, the cost of solar power is declining.

It is increasingly clear international investors are not interested in investing in large hydropower in Nepal because domestic electricity demand is not high, and the future for regional power and regulatory mechanisms are still unclear. Therefore, Nepal should instead focus on diversifying its energy mix by combining peak run-off-river and a medium sized storage hydropower, grid interconnection with renewables, upgrading the transmission and distribution system and reducing its energy loss.

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The Third pole

Source: The Kathmandu Post, May 2, 2019

Power line projects to follow one basin, one hub concept

- PRAHLAD RIJAL, Kathmandu

The government is implementing transmission line projects under the 'one basin, one hub' concept in a bid to prevent a tangle of power lines with a rapid succession of hydropower plants coming online. The Transmission System Development Plan seeks to limit the number of transmission lines connecting hydroelectric plants to major substations to streamline power evacuation.

“Allowing every power producer to build a separate transmission line will cause environmental degradation, loss of biodiversity and arable land, and put human settlements under threat. The one river basin, one hub concept aims to resolve the issue,” said Netra Gyawali, chief executive officer of the National Transmission Grid Company.

According to Gyawali, after fixing the locations of connection hubs and right of way, officials are scouting potential sites for a common hub for hydel plants under construction in western Nepal. “Around 20-22 projects are coming up in the western region, and we have expedited studies in the Karnali corridor to build common hubs and power lines along the east-west transmission super highway,” he said. “We will be completing detailed project reports of four river basin transmission projects this year, and construction work will begin shortly after that.”

According to officials, the Energy Ministry has directed the grid company to begin work at the Likhu River basin where seven hydel plants with a combined capacity of 346 MW are currently under construction. Officials plan to connect the Likhu River projects to a 220 kV substation from where power will be evacuated through a single transmission line to New Khimti Substation.

The Transmission System Development Plan has highlighted the need to have a robust distribution system to evacuate power to energy starved regions and facilitate electricity export to India and China.

The Nepal Electricity Authority is also constructing multiple transmission corridor projects in the eastern and central regions to evacuate and distribute power more efficiently. “We have expedited work at the Kabeli, Solu and Koshi corridors in the eastern region to upgrade the system for increased consumption and reliable transmission,” said Kulman Ghising, managing director of the Nepal Electricity Authority.

Studies have also begun on a 400 kV east-west power highway in the hilly region that will run parallel to transmission lines in the Tarai forming a mesh network interconnected by single radial lines along the river corridors, officials said. A mesh network provides an alternative path for evacuating power by interconnecting power lines in a loop in case of failure of single dedicated transmission lines.

The Transmission System Development Plan has divided Nepal’s power grid into five zones with at least one interconnection point with India and China to facilitate power exchange. The proposed transmission network has six Nepal-India cross-border connection points in the Tarai, and two Nepal-China cross-border connection points in the Himalayan region.

Authorities have accorded high priority to the construction of reliable transmission corridors for optimal evacuation of power for domestic consumption and export, apart from minimising costs for power producers.

In July, the Energy Ministry created a master plan in line with the government’s target of developing 15 GW of hydropower in 10 years and 40 GW by 2040. In the upcoming fiscal year alone, the electricity authority plans to issue commercial operation dates to 43 under-construction hydropower projects that will produce around 1,150 MW.

Source: The Kathmandu Post, May 1, 2019

Upper Trishuli 3A to start producing power by May 15

Technicians successfully conducted structural and performance tests on the Upper Trishuli 3A Hydropower Project. According to officials, the 60 MW scheme located 95 km north of Kathmandu in Rasuwa and Nuwakot districts is all set to start producing 30 MW within two weeks.

“Officials ran wet and no-load tests on the equipment in the powerhouse on Monday,” said Kulman Ghising, managing director of the Nepal Electricity Authority. While carrying out the tests, water is conveyed from the tunnel to the turbines in the powerhouse through the penstock pipes to test whether or not the

generators and control panels are functioning as per the design without evacuating electricity.

The state-owned power utility had planned to begin commercial operation of the hydel plant on May 1 by switching on the first unit. “Testing the headworks, equipment and other structures was time consuming, delaying our plans to start generating power,” said Ghising. “We have fully revived a project that had been stymied by multiple obstructions and are now ready to commission it.”

The project plans to drain the tunnel to check for spillage and refill it within a week, and perform the remaining tasks simultaneously. “The project will evacuate power from the first unit by May 15,” said Ghising.

The construction of a 220 kV Trishuli-Kathmandu double-circuit line to carry electricity from the plant to Matatirtha sub-station in Kathmandu has also been completed. The 45-km transmission line will start evacuating 30 MW in May and another 30 MW in June.

Apart from evacuating the power produced by the Upper Trishuli 3A project, the Nepal Electricity Authority plans to use the facility at Matatirtha to transmit electricity produced by other hydropower schemes in the Trishuli corridor.

The Nepal Electricity Authority built the Upper Trishuli 3A project with a concessional loan of \$114.7 million from the Export-Import Bank of China. The foundation stone was laid in November 2011 with the completion deadline set for May 2014.

The project sank into uncertainty after the contractor, China Gezhouba Group Company, halted work citing heavy damage to the access road and dam during the 2015 earthquake. Work resumed after a two-year hiatus, and the project was expected to come into operation by mid-January. After Upper Trishuli 3A—the largest among the projects launching this year—roars into life, 71 MW will be added to the national grid.

The electricity authority has commissioned six small and medium hydropower projects, including the 22 MW Bagmati Khola Small Hydropower Project and one solar plant built by independent power producers, in the last nine months.

Officials plan to launch another nine small and medium projects this fiscal year ending mid-July and add 160 MW to the grid, bringing the number of independent power producer-owned projects in operation to 82 from 75 last year, accounting for a combined installed capacity of 554 MW.

In the next fiscal, the electricity authority plans to issue commercial operation dates to 43 hydropower projects including Upper Tamakoshi (456 MW), Rasuwagadhi (111 MW) and Lower Solu (82 MW).

Source: The Kathmandu Post, May 2, 2019

Row over Thankot-Chapagaun-Bhaktapur transmission line could result in outage in Lalitpur, electricity authority says

- Prahlad Rijal

The electricity authority has said Lalitpur could face power cuts if a transmission line that passes through some ancient villages on the outskirts of the district, is not completed on time.

The Nepal Electricity Authority's plan to complete the decades-old 132 kV Thankot-Chapagaun-Bhaktapur Transmission Line Project has met with opposition from the locals of Khokana, Bungamati, Harisidhhi and Lamatar, who say the power utility must realign the high tension lines to curb social costs.

“If the project is delayed further, we will have no option than to enforce power cuts in Lalitpur,” said Kulman Ghising, managing director of the Nepal Electricity Authority.

According to the electricity authority, it was planning to revive the decades-old project designed to ensure uninterrupted supply of electricity to Kathmandu Valley.

As of now, the state-owned utility is feeding power in Lalitpur through the 66kV Syuchatar-Patan-Baneshwor line which it says is “already overloaded”. “Feeders in the present setup and capacity will not be able to transmit enough power,” said Ghising.

On Wednesday, an inspection team led by Ghising found a disintegrated transmission pylon lying in a field in Khokana. While officials believe locals had brought the structure down, local representatives say heavy winds had knocked it down.

Locals of Khokana, Bungamati, Harisidhhi and Lamatar have been protesting against the transmission line project demanding that the high tension lines must be rerouted and aligned with other development projects to preserve cultural heritage and reduce threats on human settlements.

“The residents have asked the officials to pay heed to cultural heritage and future livelihood of the human settlements in the area and align the high tension lines with the Kathmandu-Nijgadh fast track, and outer ring road,” said ward chair Rabindra Maharjan. “The authorities had during a meeting of the stakeholders assured denizens that they would carry out discussions and come up with a solution,” Maharjan told the Post. “But nothing has been done yet.”

Works on the Kathmandu-Bhaktapur front of the project have already been completed, according to the electricity authority.

“Harisidhhi locals have not allowed the authority to resume works despite receiving proper compensation for the land acquired for towers and a building for a substation,” a source at the electricity authority told the Post on condition of anonymity because he was not authorised to speak to the media.

“Locals have demanded that the authorities either change the route of the power lines or provide them 100 percent compensation,” the source said. “Authorities are holding discussions to fix the acquisition and compensation rates for the land—nine metres left and right—through which the high tension lines run.”

The transmission lines run through 14 km in Lalitpur where the authority plans to set up at least 51 pylons. Of them, foundations have been built for 35 towers and 15 towers have been erected. But the high voltage cables have not been installed.

The electricity authority had terminated the contract of the \$23 million project nine years ago after obstructions from the locals.

“The previous contractor had imported all materials and equipment needed to erect the towers,” said Sunil Mahato, the chief of the project. “If we are allowed to resume works, we can complete the project within six months.”

The state-owned power utility has been paying 100 percent compensation for installing towers and 10-25 percent of the value of land that falls on the right of way. It had distributed 25 percent in right-of-way compensation in Bhaktapur and Kathmandu.

The state-owned power utility has also almost completed construction of the Matatirtha sub-station as new projects will soon start generating electricity soon.

On Monday, technicians concluded the structural and performance tests at Trishuli 3A hydel plant which will supply an additional 30MW to the valley via Matatirtha.

“The Matatirtha substation with a capacity of relaying 1,500MW of electricity is nearing completion. But if we are not allowed to complete the Thankot-Chapagaun-Bhaktapur transmission line, we will not be able to supply additional electricity to Lalitpur,” said Ghising. “Upon completion, we will be able to improve supply through the 132 kV main lines with higher capacity than the existing 66kV line and eliminate the issue of voltage fluctuations in the Valley,” added Ghising. “If the transmission line is not completed, there will be outage; and it will be despite having power in abundance.”

Source: The Himalayan Times, May 2, 2019

Locals obstruct transmission line tower work in Khokana

It has been 20 years since the locals of Lalitpur district have obstructed and delayed the construction of the 28-kilometre-long 132 kVA Thankot-Chapagaun-Bhaktapur transmission line. Nepal Electricity Authority (NEA) has said that the project is a strategic one in terms of it being an additional backbone transmission line of Kathmandu Valley.

NEA has informed that locals of Khokana, Bungmati, Harisiddhi and Lamatar have time and again obstructed the construction works of the transmission line towers.

Kul Man Ghising, managing director of NEA, has warned that if the locals continue to hamper the construction works, the power utility will be compelled to resort to load-shedding in those respective areas.

“The electricity demand in all the three districts of the Valley has been continuously rising, but we are facing problems in constructing the strategic transmission line,” Ghising said, adding that the existing transmission backbone is unable to withstand the new electricity demand. “We are trying to resolve the problem through discussions and if locals are still unwilling to allow construction works, then NEA will be impelled to cut off electricity in those areas,” he stated.

Meanwhile, locals of concerned areas have been asking NEA to change the route through which the transmission line will pass. They have been saying the present route that NEA has chosen will affect the beauty of the historical and indigenous Newar culture in those areas. Locals have also sought 100 per cent compensation for the land that lies within 25 metres on either side of the transmission line. The general practice is to pay compensation for land that lies within nine metres only. The other option that locals have put forward is to lay the transmission line underground.

As per NEA, it has already completed construction works in Kathmandu and Bhaktapur sections.

Earlier, locals had dismantled a transmission line tower in Khokana. A high-level NEA team had visited the site on Wednesday and tried to convince the locals, but to no avail.

Ghising further informed that NEA is constructing a 1,500-megawatt capacity substation in Matatirtha of Thankot. If construction of the transmission line is further obstructed then NEA will not be able to distribute sufficient electricity in some parts of Lalitpur and Bhaktapur, he added.

At present, the state-owned power utility is distributing electricity in Khokana area through the 66 kVA Syuchatar-Patan-New Baneshwor transmission line and it has said that the line is already overloaded.

NEA has already acquired right of way land where the transmission towers will be built in those areas.