

Rural Electrification in Bhutan

Official Development Assistance loan project in collaboration with Bhutan Power Corporation



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Project profile

	Phase I	Phase II
Duration	May 2007 - June 2015	June 2011 - Oct 2022
Loan amount	JPY 3,576 million	JPY 2,187 million
Interest rate	semi annually @ 0.01% per annum on the principal disbursed & outstanding.	semi annually @ 0.2% per annum IDC semi annually @ 0.1% per annum for CC semi annually @ 0.01% per annum for consultancy services
Repayment	40 years (including 10 years grace period)	40 years (including 10 years grace period)
Amount used	JPY 3,237 million	JPY 1797.54 million (as of October 2021)
Outcome (no of households electrified planned)	15,322	5,157 (including Off-Grid hhs)
No of household electrified	16,241	5,785
Contribution to national RE rate	18%	



Electricity brings momentous improvement in villages

Story by Yangyel Lhaden

After decades of prolonged exposure to indoor pollution, the coming of electricity has improved the lives of many a villager.

In Tomi, Pemagatshel, seventy-year-old Sangay Choden now uses modern appliances such as rice cooker and water boiler. Her humble domicile is lighted by LED tube lights. Tomi got electricity in 2015.

“Look at my eyes,” said Sangay, taking off her sunglasses. Bloodshot and rheumy eyes, she said was because of a lifetime’s toil in the kitchen. “I have gone almost blind cooking all these years on traditional wood stove and exposure to smoke. My eyes used to water the whole day.”

But she does not cough now as much as

she used to. “I cannot find words to express how grateful I am for the electricity.”

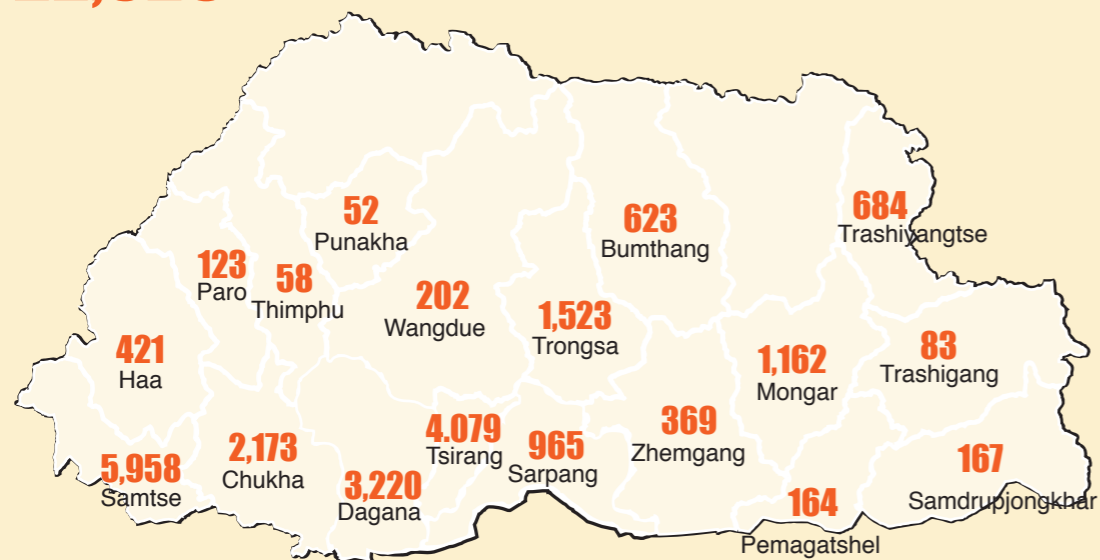
For Sangay Choden rice cooker is magic. “I don’t have to pay attention while cooking rice. I just have to plug in and put on the switch. I have enough time to do other works.”

Wang Gyeltshen, a Tomi resident, said that in the past young people used to fall sick easily and coughing was a routine. “Our houses would be filled with black smoke and walls covered with soot.”

He said that people’s health has generally improved and expectancy increased.

In Dechenling gewog, a villager in Kholomri said that electricity brought vast changes in all aspects of life. “Education has improved. Health and sanitation has seen a sea change.”

22,026 households electrified





Tshering Dorji, a retired civil servant in Kholomri said that with the electrification of the village in 2012, the children got to focus more on the study. “In 2021, the pass percentage of Dechenling Central School is around 99.30 percent.”

In 1972, Tshering Dorji studied in Dechenling school as a boarder. Evening and night study time was hard without electricity or a generator. “We would have soot-filled noses from kerosene lamps and red eyes. It was very painful.”

Tshering Dorji said that exposure to pollutants meant that one easily caught cough and cold. “The school had just about 90 students. Difficult situation made most quit.”

Today, there are around 250 students in the school.”

Lack of electricity also had an adverse effect on maternal health in remote villages.

In Dagapela, Dagana, Lekzom gave birth to a boy at around 11:00 pm in 2009. When the family ran out of candles or kerosene, the only option left was to walk to the nearest shop which is about two hours away only to find that the shop had closed. She suffered labour pain in total darkness, alone. She gave birth in a smoke-filled room with lighting from wood shavings and a bamboo torch.

“Today, road and electricity have improved maternal health in the village,” said Lekzom. “Routine checkup and giving birth has become so much easier.”

Electricity has also made access to information easy for villagers, who now keep themselves abreast of national and world events. It made managing recent lockdowns convenient.

Tshogpa of Gesarling chiwog in Dagana, Tenzin Wangchuk, said that the chiwog has a messenger group chat to update villagers on Covid-19-related information. “In the event of a lockdown, it is not possible to visit households. So we ask villagers to share their problems on the group chat.”

“This would not have been possible without electricity, of course,” said Tenzin Wangchuk. “Mobile phones have made communication easy and convenient.”

When she first heard about Covid-19 from her neighbour, Sangay Choden panicked. “People were dying and there was no treatment or medication.” Health and gewog officials called late that night and advised her to wear face mask, wash hands regularly, and avoid unnecessary contact with other people.

“Had it not been for electricity and a machine like this [mobile phone], Covid-19 would have had us all,” said Sangay.



Electrifying rural villages in rugged terrain

Story by Yangyel Lhaden

From employing villagers to using horses and even choppers, Bhutan Power Corporation Limited (BPCL) ferried materials to electrify rural villages.

The rural electrification work for three chiwogs of Dungmin gewog in Pemagatshel, Tome, Woongborang and Nome, started in 2013 with villagers and horses transporting electrifying materials through rugged terrains infested with leech and wild animals.

It took 10 men an entire day to carry one telescopic pole to the chiwogs, who carried the pole from the nearest farm road of Khawar

Goenpa, about 25 kilometres from the gewog centre and about 30 kilometres from the chiwogs.

There are five sections in one telescopic pole. A telescopic pole is about 12 metres tall weighing about 200 kilogrammes.

Although the project was supposed to complete in a year, it took almost three years because of the difficulty in transporting the materials.

BPCL's lineman and supervisor of rural electrification project in Dungmin gewog, Tandin Jamtsho, said about 10 men were

involved in carrying the telescopic pole and only one set could be transported to the chiwogs daily. "120 set of telescopic poles were required for the electrification."

He said rain damaged roads in summer and transportation team had to wait for days before the roads were fixed. "It took about a month to transport huge transformers."

Tandin Jamtsho said that along the stretch between the chiwogs and Khawar Goenpa, there was no water and the workers had to carry water. "The stretch is also prone to human-wildlife conflict."

A former non-formal education instructor from Nome, Ugyen Sonam, was also involved in carrying the electric poles.

He shared how they encountered a bear while ferrying the telescopic pole and he had to fight the bear. "I always carried a knife in fear of wild animals."

Similarly, rural electrification projects in Dagana's lower and upper Gesarling, Samtengang, Tanju and Gangjab started in 2011.

Although the villages were then connected with farm roads, roads were not pliable in summer and transportation team had to carry electrical equipment from Dagapela.

The projects completed in 2013.

BPCL officials said the main challenge in transportation was continuous rainfall from June to October, washing off roads and landslides blocking the roads.

The corporation's associate engineer, Bal Bahadur Chhetri, said transporters risked their life to ferry the equipment to rural villages.

He said transporting materials to Dorona and Tshalabji was difficult. "The transportation team had to pass through a thick jungle infested with elephants, bears, and snakes."

Bal Bahadur Chhetri said BPCL officials travelled with contractors and villagers, who were familiar with the road for safety. "I once stepped on a snake, but it bit my gumboot."

He said BPCL and JICA are happy that despite all challenges, they made life easier for many rural residents. "It was our greatest achievement."



Barshong: Bright and beautiful

68 households connected with electricity in remote Barshong

Story by Nima Wangdi



Once hidden behind the tall hills in north Thimphu, Barshong was a remote village in Thimphu dzongkhag. With a road that is partially black-topped, it is now a two-hours drive from Dodeyna, at the base of Tango monastery.

Barshong is now connected with electricity, a welcome development that has changed the lives of the people, especially students.

Pema Yangchen Lhamo, a class V student of Barshong Primary School, has never touched a computer until recently. With electricity enabling the school to have ICT class, the 12-year old girl enjoys trying her hands at coding. The school started the game-based programming, Code Monkey. "Thanks to electricity we can learn new things," she said.

Beyond the school, in one of the two identically painted traditional houses, Sonam Tashi, 25, is listening to Rigsar songs as he helps the carpenter working on his house. He bought a music system a few months before his house was electrified.

"I am a music lover and I play it loud inside the house while I work around," he said. He used to play music on his mobile phone in the past when there was no electricity. He said the solar panels did not work when it snowed or rained and charging mobile phones was a problem.

His neighbor, Tshering Yangki, 50, has a small wooden shack in which a dark blue washing machine is installed. She said that the village was cold especially during the winter and washing clothes manually was a torture. "Having a washing machine is not only convenient but also helps reduce firewood consumption in the village," she said.

Pointing at a pair of Eveready torch batteries on her window sill, Tshering said there is no need for torch batteries. With light bulbs fixed on all sides of her house, the house looks bright at night.

Electricity has also given villagers like Tshering more time to spend in the fields. Household appliances like boilers and cookers, she said, was like having an extra pair of hands at home.

Barshong Mangmi, Chador Namgay said that electricity also helped keep bears, a menace in the village, away. The villages faced problems of bears breaking into houses usually and people could not come out of houses at night.

Mangmi said he is already seeing changes in the village. "Not having to live in smoke from the Bukharis (wood-fed stoves) has contributed to a hygienic and healthier lifestyle. Gradually, people can also buy television screens and live more comfortable lives."

Having electricity in the village, according

to Naro Gup Gem Tshering is like a blind person seeing the world suddenly.

Barshong got electricity with support from the Japan International Cooperation Agency or JICA. He thanked JICA for lightening up the village. He said that electricity is beneficial to all people in many ways. "It could help expedite the progress of construction works as people can use different machines."

JICA Bhutan's Chief Representative, Watanabe Kozo, during the closing ceremony of the overall JICA Projects in Bhutan said that they worked with Bhutan Power Corporation (BPCL) for a long time for rural electrification Phase 1 and 2. He expressed his appreciation to BPCL for completing the project on time despite the pandemic.

"We are still holding meetings on the next assistance plans," Watanabe Kozo said.

BPCL's Chief Executive Officer, Sonam Tobjey said Barshong was electrified as a part of the JICA II loan savings programme-off grid-to on-grid. He said 1,549 households have been electrified under the program in 15 districts.

A total of 22,024 households were electrified in 20 districts under JICA I and II financing. "This is expected to benefit the people in many aspects like income generation, entertainment, use of electrical appliances, reduction of firewood consumption, saving time, extending study time for students and better health and hygiene."

BPCL's senior Engineer, Pasang said that 68 households have been electrified in the village excluding the school, Basic Health Unit, gewog office and livestock office. The two-year project term that started on November 19, 2019 was supposed to be complete on November 18, 2021. "Due to the unavoidable problems faced during the project, the project term had to be extended by one month."

It was finally completed on December 2021.



Enlightening Kila Goenpa

Story by Chhimi Dema

For many years, nuns at the Kila Goenpa meditation center in Paro like many villagers across the rural pockets of the country gathered wood from the forest for cooking and lighting. They washed their clothes in freezing water in winter and would wrap themselves in blankets to stay warm.

One fine day in 2013, it all changed. The centre was connected with electricity through the rural electrification project supported by Japan International Cooperation Agency (JICA). Their lives changed over night. Life in the meditation centre, nestled on cliff rock, got brighter.

The centre, which is home to 17 nuns and their lama, is said to be built in the 9th century by Druptob Chhoeje Norbu.

Deki Wangmo, who has been living at the meditation centre for the past 22 years, said that she used mud stoves to cook and collected firewood for weeks. "Today, with a

little effort and switching on a button, we can finish a task that used to take us hours every day."

The meditation centre today has electric home appliances such as geysers, rice and curry cookers, washing machines, and refrigerators, among others.

Deki Wangmo said that maintaining hygiene has become easier today with a continuous water supply and energy source.

"A few years ago, it was arduous to make arrangements to bath making it difficult for us to stay hygienic," she added.

The entire establishment including the lhakhang, meditation centres, and rooms are connected with electricity today.

Electrification has made it easier for nuns to communicate with friends and family.

Deki Wangmo shared that years ago, anyone who visited the town or village had to take all the smartphones to charge. "The

person spent sleepless nights trying to charge all the phones.”

Some nuns had extra batteries to replace when one exhausted.

Deki Wangmo said that the forest is growing thicker and more pristine as they have stopped cutting trees for firewood.

The Head of the centre, Lama Namgay, said that inside the lhakhang such as the ancient murals and adornments were covered in smoke from the oil lamps from centuries ago.

Lama Namgay said: “The lives of the nuns improved with electricity. The time they spend collecting firewood and cooking by the fire is spent chanting prayers and meditating today.”

He said that the JICA and the government’s support have helped them to live more comfortable lives.

The meditation centre was previously a shedra but it was moved to Tenchen Goenpa in Paro. Recently, the nuns began their three-year meditation at the centre.

Gakiling and Sombaykha farmers reap RE benefits

Story by Chhimi Dema

In Dorithasa village of Haa, electricity has brought hygiene, telecommunication connectivity, easy health service accessibility, and much more.

Dorithasa under the Gakiling gewog is a remote village in the north-western part of Bhutan and remains isolated when flash floods wash away most of its roads. It was connected to electricity along with Sombaykha gewog only three years ago in 2019.

The electrification project with support from Japan International Cooperation Agency (JICA) benefits 76 households today. The JICA project, in total connected 421 households in Haa.

Some months after the village was connected with electricity, the Covid-19 pandemic hit Bhutan. After the government declared lockdown and all learning switched to online.

A university graduate, Sonam, shared that during the pandemic, she could attend online classes with electricity in her village. “Without electricity, attending online classes would have been challenging,” she said.

Facilities such as table lamps allow students to study at night, she added. “This was impossible before because the soot from the oil lamp hurt our eyes and we could barely see.”

Sonam Wangchuk, 56, from Dorithasa in Gakiling gewog, said that electricity brought comfort to their lives. “We had to walk for three days to get oil for lamps to light the house without electricity,” he said.

According to the Statistical Yearbook 2021, 48 towns and 4,510 villages have electricity.

The Bhutan Power Corporation Limited (BPC) had 213,640 consumers in the country in 2020.



Another farmer, Sonam Choden, said that now she can spend more time in the fields. She does not have to watch the rice cooker or wait to heat water on the mud stove. “It is easier to maintain cleanliness in our homes too.”

The villagers today own televisions, washing machines, and refrigerators. Some also have electric rice mills.

Connecting Phenteyna and Sektana villages, in Gakiling gewog, to electricity were the most challenging for BPC and the contractor.

The villages are closest to Dorokha, Samtse but the equipment and poles were

sent from Haa.

According to the BPC officials, the transportation of materials was the biggest challenge. “There was no road then and the materials were carried through the dense forests to the villages.”

There were no bridges during the construction so the poles were tied on float water tubes and taken from Haa to the two villages.

BPC officials said that a contractor withdrew before completing the work and left all the equipment halfway before reaching the site because of transportation difficulties.

Rural electrification is an essential part of rural development enhancing the quality of livelihood and rural income.

Kozo Watanabe
Chief Representative,
JICA

Rural electrification has brightened the lives of thousands of rural people.

Sonam Tobjey
Chief Executive
Officer, BPCLL

