

CASE STUDY

Electrifying Remote, Rural Communes through Hydropower



Viet Nam taps renewable energy to supply affordable electricity to remote communities. Photo credit: ADB.

A rural electrification project in Viet Nam built mini-hydropower plants and rehabilitated distribution networks to provide affordable electricity to remote communes.

Overview

Rural electrification has been one of Viet Nam's notable achievements over the past decades. The national utility, Viet Nam Electricity, estimates that in 1975, electrification among poor households in the country was no more than 2.5%. Yet in a little over 3 decades, the country was able to connect millions to the national grid. By mid-2000, 97% of Viet Nam's 11,000 communes enjoy the comfort and opportunities that come with electrification.

Despite this success, some 278 communes in the remote mountain provinces remain unconnected and without power. These communes are home to some of Viet Nam's indigenous communities. Lack of electricity in these areas is a major development constraint for improving living standards, income opportunities, and delivery of basic social services.

A project supported by the Asian Development Bank and the Clean Energy Fund built mini-hydropower plants and rehabilitated existing distribution networks to provide reliable and affordable supply of electricity in poor and remote communes of Viet Nam.

Project snapshot

Dates	<ul style="list-style-type: none">• 30 March 2009: Approval Date• 24 May 2018: Closing Date
Cost	<ul style="list-style-type: none">• \$201 million: Actual Project Cost
Institutions and Stakeholders	<p>Executing agency</p> <ul style="list-style-type: none">• Central Power Corporation• Northern Power Corporation• Southern Power Corporation <p>Financing</p> <ul style="list-style-type: none">• <u>Asian Development Bank</u>• Climate Change Fund• Clean Energy Fund under the Clean Energy Financing Partnership Facility

Development Challenge

Viet Nam's previous long-term development strategy for rural electrification involved the Viet Nam Electricity taking the lead in extending the medium-voltage network to rural areas and the provincial and district governments owning the investment and operation of low-voltage distribution systems in remote areas. Unfortunately, this approach has led to poorly constructed low-voltage networks with low service quality and high distribution losses. Many villages were left without power connection but were officially classified as electrified only because their commune centers are connected to the grid.

The government decided to transfer the development of low voltage networks to Viet Nam Electricity to expedite the electrification of the remote parts of the country mainly populated by poor and vulnerable ethnic minorities.

Context

Viet Nam has seen major economic growth over the past 3 decades. The energy sector is one of the foundations of this growth and has played an important role in poverty reduction. By 2020, the government aims to provide access to electricity to 99.9% of all Vietnamese families. With an annual gross domestic product growth of about 7%, Viet Nam will need to increase its power generation to 129,500 megawatts by 2030.

The country is tapping renewable energy as one of the ways to address its rising energy needs.

Solution

With funding support from ADB and the Clean Energy Fund, Viet Nam implemented the Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project to build mini-hydropower plants that can generate sustainable cash flow and to subsidize the rehabilitation of existing networks to enable grid expansion to the communes.

Developed new mini-hydro power plants

The project built three mini-hydropower plants in Viet Nam's northern region and two in the central region. With a total capacity of 32.5 megawatts, these powerplants can generate up to 122 gigawatt-hours per annum. They provide electricity to 8,767 households in 36 villages, including 827 households that gained access to electricity for the first time.

Rehabilitated existing networks

The project extended or rehabilitated around 2,000 kilometers of medium-voltage network and 7,000 km of low-voltage network. The improved networks reached more than 3,000 villages and provided electricity to 300,034 households in the remote and mountainous provinces.

Subsidized new connections for poor families

A total of 142,572 households received subsidized service connections, including wiring inside the house, and a power socket and bulb.

Results

Household electrification increased from 83.5% at appraisal to 96.8% at project completion. Reliable and affordable power supply—an average of 6.54% of household monthly expenditures—led to socioeconomic development. Households consumed about 6 gigawatt-hour of electricity per year for income generating activities. This reduced the poverty rate in the project districts by 50% in 2017.

Building the mini-hydropower plants near the remote areas minimized grid loss. Meanwhile, using hydropower has reduced greenhouse gas emission by 70,532 tons per annum in 2019.

Access to electricity has likewise created employment opportunities and additional income for women

through increased agricultural productivity due to mechanization and increased opportunities for small business development. Electric household appliances contributed in reducing women's time poverty. Street lighting has made public places more secure for women and children.

Electrification has also reduced the health risks associated with kerosene lighting and contributed to greater household comfort. It provided better environment for children to study.

Lessons

Rural electrification programs should promote revenue-generating activities in project areas not only to help intended beneficiaries but also to support the financial and economic viability of the project through greater electricity use.

To promote the productive use of electricity and implement social safeguards more effectively and efficiently, attention should be given to:

- disclosing information and consulting with relevant stakeholders in a more targeted manner;
- designing and implementing developmental activities more targeted to each group of ethnic minorities; and
- collaborating closely with local authorities to match the proposed developmental support and local needs.

Moreover, leveraging hydropower resources is a huge step toward powering remote areas. To achieve universal access to electricity, a strong national policy on rural electrification must be established and national institutions must be empowered. Investments in power transmission and distribution infrastructure are also necessary.

Resources

Asian Development Bank (ADB). 2019. *Viet Nam: Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project*. Manila.

ADB. 2011. *Viet Nam's Success in Increasing Access to Energy through Rural Electrification*. Manila.

ADB. 2010. *Viet Nam: Powering Ethnic Minority Women in Remote Communes*.

Khanh Vu. 2019. *Viet Nam Will Face Severe Power Shortages from 2021: Ministry*. Reuters.

Viet Nam Electricity. 2018. *Renewable Energy Development: Challenge in Operating Viet Nam's Power System*.



Au Minh Tuan

Senior Project Officer (Energy), Vietnam Resident Mission, Asian Development Bank

Au Minh Tuan has been with ADB for 20 years. He is responsible for managing ADB's energy sector operations in Viet Nam, including administering energy projects and programs. He has 25 years' experience working on information technology and energy sectors.



Asian Development Bank (ADB)

The Asian Development Bank is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



Follow Asian Development Bank (ADB) on

Last updated: March 2020