

Source: Nurani Oktavia Robelus.

LIGHTING THE WAY FOR GROWTH IN RURAL MYANMAR

ESMAP's grants of more than \$3 million have been instrumental in supporting electrification efforts in Myanmar as part of the World Bank-funded National Electrification Project since 2014. The project has provided electricity to more than 2 million people, 10,000 health, education, and religious facilities, and over 40,000 street lights. Grid extension has been complemented by mini grid and off-grid solar solutions in remote rural areas, which have contributed to local economic development, income generation, job creation, and social inclusion. Citizen engagement, social inclusion, and gender monitoring mechanisms have been incorporated in the electrification program to enhance its sustainability and development impact. Recently, the citizen engagement mechanism has been utilized to increase public awareness about the COVID-19 pandemic.

INCREASING ELECTRICITY ACCESS IN MYANMAR THROUGH PARTNERSHIPS

When the World Bank started its reengagement in Myanmar in 2012, less than a third of the population was connected to the power grid. Most rural households were relying on candles, kerosene, and diesel generators to meet their energy needs, which took up a large share of their daily income. The lack of affordable and reliable power was a key constraint for essential services such as health and education, as well as income-generating activities. Access to electricity was identified by the government of Myanmar and the World Bank as vital for reducing poverty.

Recognizing the scope of the challenges, the World Bank, with support from ESMAP, helped Myanmar prepare the National Electrification Plan and a roadmap for its implementation in 2015. The goal is to bring electricity to everyone in the country by 2030 through a least-cost framework for the rollout of the national grid and off-grid electrification with modern solar home systems or mini grids in the most remote villages that would otherwise have had to wait years for grid connection. Since its adoption, the plan has also provided a framework of engagement with development partners and donors on the government's electrification agenda.

IMPACT UNDER THE WORLD BANK'S NATIONAL ELECTRIFICATION PROJECT (NEP)

- Electricity has reached 2 million people, of whom 50 percent are female, in 7,378 off-grid villages and 2,086 grid-connected villages
- 85 mini grids have been approved, mostly solar, developed by local and international entrepreneurs, and more than 340,000 off-grid solar system installations are serving marginalized areas
- Over 10,000 health, education, religious facilities, and 40,000 street lights have been connected through grid and off-grid solutions, enhancing the project's social development impact on communities
- 37 MW renewable energy capacity and 219 MWh battery storage have been installed providing households with solar home systems or mini grids at a high level of service

"Better transport and electricity will create jobs and attract more foreign investment," said State Counsellor Daw Aung San Suu Kyi.

In 2015, the Bank approved a \$400 million concessional loan for the National Electrification Project (NEP) to finance investment and capacity-building activities in grid and off-grid electrification to support the first phase of the National Electrification Plan.

The government's plan leveraged an additional \$200 million in committed funds to date from other development partners.* These partnerships also led to improving the policy and regulatory framework as well-coordinated capacity building for electrification efforts. The government has also set up a dedicated sector working group to engage on access issues, with participation from donor and government agencies.

ESMAP's ROLE IN THE NATIONAL ELECTRIFICATION PROJECT

Geospatial Planning and Multi-Tier Framework

ESMAP provided the financial support for the geospatial least-cost analysis that underpinned the National Electrification Plan for reaching the government's universal access goal by 2030, as well as the preparation and implementation of the World Bank-funded NEP. The support has allowed the prioritization of grid and off-grid investments, and catalyzed public and private funding based on a specific electrification roadmap. Progress on achieving the electrification results has been tracked through the ESMAP-funded Multi-Tier Framework, which contributes to informed policy and decision making by the government on its electrification priorities.

Reliable Electricity Supply and a Brighter Future through Mini Grids

ESMAP has supported the mini grid program through technical assistance, capacity building, and advisory services aimed at developing the policy and regulatory framework, design, and cost optimization, promoting productive use of electricity, and screening of environmental and social impacts. The mini grid scale-up in Myanmar has become one of the most dynamic

* Partners include the Italy Agency for Development Cooperation (AICS-Yangon), the French Development Agency (AFD), German KfW and GIZ, Asian Development Bank (ADB), Japanese International Corporate Agency (JICA), the UK Department for International Development (DFID), Norway, New Zealand, Pact, and Smart Power Myanmar/Rockefeller Foundation.



Lighting the Way for Growth in Rural Myanmar—Agriculture. Source: Nurani Oktavia Robelus.

programs of its kind. Lessons learned have been shared with countries from the region, such as Bangladesh and Pakistan, and beyond in Sub-Saharan Africa.

So far, 85 mini grids have been approved, mostly solar. Of these, 37 are already operational—developed by local and international entrepreneurs—providing 24-hour reliable electricity to rural households, enabling income-generating activities, clean water provision, improved health and education services, and street lighting. Women are benefitting from better social services, increased safety, improved communication, and new entrepreneurship opportunities. In the context of Covid-19 pandemic, the mini grid developers engaged local communities in the distribution of soap, protective equipment, and hand sanitizer, while also providing tariff discounts and donations. Displacing polluting diesel generators, these mini grids have also contributed to a reduction of greenhouse gas emissions by 93.9 kTC carbon dioxide equivalent.



Lighting the Way for Growth in Rural Myanmar—Agriculture. Source: Nurani Oktavia Robelus.

The efforts of the successful implementation of this large mini grid solar program have been recognized through the 2019 Association of Southeast Asian Nations (ASEAN) Energy Awards to the Department of Rural Development, which implements the off-grid component of the NEP.

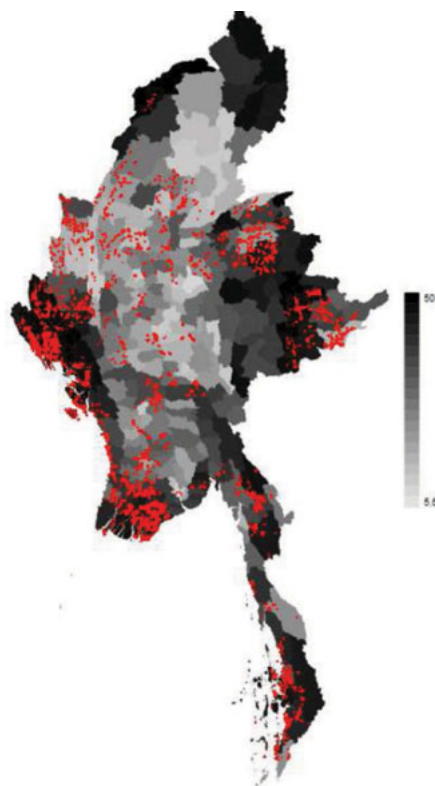
U Khaing Soe Oo, a farmer in Myanmar's Ayeyarwady Region, said: "Since getting the mini grid in 2017 we feel like we've been living in a town. We have street lights like those in towns. We have televisions like those that are being watched in towns. We can charge cellphones, use electric cookers. Water is boiled by electric kettles. We can use these at any time of day. There are no power cuts in our village. Since we can diversify our business activities, our income has increased."

Off-grid solar providing light and socioeconomic opportunities to marginalized communities

The government has an ambitious goal of delivering 456,500 solar home systems to rural communities mostly in border states, fragile, and remote areas of the country, as well as promoting private sector-led market development of solar home systems in central Myanmar. ESMAP's support has been pivotal in developing sustainable public- and private-led business models for off-grid solar, bringing a focus on product and service quality, accountability, and community engagement.

The government needed a systematic and efficient way of identifying households, recording which system size they selected based on electricity usage, and tracking and verifying installation progress. ESMAP's technical assistance supported the development and implementation of a "management of information system" with several layers of data—households survey, installation, verification, and payment—that has allowed the government and the World Bank team to closely monitor progress, ensuring timely reporting, and decision making related to program implementation. This system is a first of its kind and can be replicated in other electrification programs.

In addition to households, solar home system installations for public facilities (clinics, schools, religious facilities) and street lights have extended the benefits of electricity to entire communities. Enhanced monitoring systems, robust technical standards, and a network of service centers set up by local entrepreneurs for



An analysis of solar home system installations under the National Electrification Program based on geospatial tagging shows the program has, to a great extent, reached the most marginalized regions of the country. Red dots show households with solar home systems, while township colors are based on their score in the Multi-dimensional Disadvantage Index (MDI). The more disadvantaged the township, the darker is its representation on the map. Source: World Bank.

post-installation operation and maintenance, have laid the groundwork for long-term sustainability of the program.

In Kanti village in the Tanintharyi Region, mini grids and solar home systems have allowed nurses and midwives to work with bright lights when seeing patients and they no longer have to depend on charcoal to boil and sterilize medical instruments. *"Now that we have electricity, our medical tools are sterilized by simply inserting a plug and turning on a switch,"* said **Khin Shwe San**, a village health officer.

ESMAP has also provided grant support for commercial market development for Lighting Global-certified solar products in close collaboration with IFC. IFC-led Lighting Myanmar's intervention has generated market intelligence, and enabled business-to-business support, access to finance, and customer awareness on quality

solar products. A results-based financing off-grid solar facility (\$3.45 million) funded by ESMAP and the Global Partnership for Results-Based Approaches (GPRBA) is expected to accelerate private sector-market development for off-grid solar in central Myanmar through support to companies for the development of the supply chain.

Solar systems bring enormous benefits to whole villages. Just two light bulbs in a rural family's home allow for many more hours of productivity and for students to study in the evenings. In a village, they allow for street lights to improve safety and for shopkeepers to stay open later to earn extra income. Given the evolution of solar technology and energy-efficient appliances, the off-grid solar has significant productive-use potential in Myanmar.

Tracking Impact, Citizen Engagement, Gender Benefits, and Social Inclusion

Myanmar has 135 distinct ethnic groups. Implementing an electrification program is often complex on the ground, as it deals with people of various ethnic and religious backgrounds. ESMAP funds have been channeled to support initiatives aimed to improve the broader development impacts of Myanmar's electrification program encompassing:

- **Inclusive community participation:** Field research was carried out to understand barriers for women and other vulnerable groups in accessing electricity connections and participating in those decision-making processes. The insights were distilled in a report that informs the design of a power-to-poor scheme that will enable services to the poorest areas. Moreover, gender and social inclusion monitoring surveys have been implemented for the solar home system program, which revealed positive impacts for women, including reading, improved health and safety, communication and information, entrepreneurship, and empowerment.
- **Citizen engagement and accountability of service delivery:** A call center combined with the use of the Viber app has facilitated two-way communication between the government and households to get feedback directly from the beneficiaries on the quality of installation and electricity services, and the customer service provided by the installation contractors. The feedback provided early confirmation of positive results, where services needed improvement or repair—which was provided within two weeks of notice—allowing grievances to be addressed in almost real time and improving the accountability of electricity service delivery. This citizen engagement mechanism has been utilized recently to increase public awareness about the COVID-19 pandemic.
- **Public outreach and stakeholders' engagement** have been critical in communicating the project's results, addressing implementation challenges, and rallying broader support for scaling up electricity access.

LOOKING FORWARD

Altogether, the NEP is expected to benefit around 6 million people with new electricity connections by 2021. To reach the universal access goal by 2030, the business models successfully piloted under the NEP are expected to be further mainstreamed and scaled up through government programs and donors' support. The World Bank with ESMAP assistance will continue to support the government of Myanmar expand access to electricity and clean cooking solutions, with increased focus on fostering economic impacts and social inclusion. The electrification program represents a central piece of the World Bank's engagement in the energy sector in Myanmar along with improved reliability of power supply and sector governance.

For more information visit www.worldbank.org/myanmar or www.esmap.org

ESMAP MISSION

The Energy Sector Management Assistance Program (ESMAP) is a partnership between the [World Bank](http://www.worldbank.org) and **18 partners** to help low- and middle-income countries reduce poverty and boost growth through sustainable energy solutions. ESMAP's analytical and advisory services are fully integrated within the World Bank's country financing and policy dialogue in the energy sector. Through the World Bank Group (WBG), ESMAP works to accelerate the energy transition required to achieve [Sustainable Development Goal 7 \(SDG7\)](https://www.sustainabledevelopmentgoals.org/) to ensure access to affordable, reliable, sustainable, and modern energy for all. It helps to shape WBG strategies and programs to achieve the [WBG Climate Change Action Plan](https://www.worldbank.org/en/programs/wbg-climate-change-action-plan) targets.