

Source: Addis Ababa sunrise by Benedek.

## ETHIOPIA'S ENERGY SECTOR TRANSFORMATION

*By assisting the Government of Ethiopia in incorporating gender-focused solutions, bolstering markets for off-grid products, and scaling up private sector participation in the country's vast renewable energy resources, ESMAP has facilitated new investments, strategies, and approaches to help reach the goal of universal electricity access.*

### A FOCUS ON HOUSEHOLD ELECTRIFICATION

Over the past decade, the Government of Ethiopia has launched one of the most successful electrification programs in Sub-Saharan Africa, expanding the electricity grid to nearly 60 percent of the country—from only 667 towns and villages to approximately 6,000.

However, the household electrification rate remained stubbornly low, at only 20 percent in 2015. With more than 60 million people without access to electricity, Ethiopia still had the second largest energy access deficit in Africa. Understanding that affordable and reliable access to electricity was essential to reducing poverty and shifting toward higher rates of productivity and industrialization, the Government of Ethiopia committed to reaching universal energy access by 2025.

### FROM VISION TO STRATEGY

New investments and strategies would be necessary to reach the goal of universal access, including private

The NEP and NEP 2.0 adopt an integrated, sectorwide approach to achieve the ambitious goals it sets for the electrification of the country. This approach encompasses a number of development partners in order to achieve these goals, including the World Bank, the European Union (EU), the United Kingdom's Department for International Development (DFID), the United States Agency for International Development (USAID), the African Development Bank (AfDB), the French Agency for Development (AFD), the United Nations Development Programme (UNDP), the German Agency for Co-operation (GIZ), the Swedish International Development Co-operation Agency (Sida), and the European Investment Bank (EIB).

Source: [National Electrification Program 2.0: Integrated Planning for Universal Access](#), Federal Democratic Republic of Ethiopia, 2019



Source: Street in Machew, Northern Ethiopia, by Raimond.



Source: Street scene women in Harar by Emad Aljumah.

sector participation, off-grid solutions, and scaling up the country's vast renewable energy resources.

In 2015, the World Bank's [Energy Sector Management Assistance Program](#) (ESMAP) funded a four-year World Bank engagement to provide the Government with solid sector diagnostics and identify key sector reforms, with a focus on electricity access. The engagement was instrumental in helping the Government to develop a strategic approach—the National Electrification Strategy (NES)—and eventually on-the-ground tactics and actions—the National Electrification Program (NEP).

The first NEP was launched in 2017 to strategically shift focus from infrastructure development to delivery of adequate, reliable, and affordable electricity services, in line with the recommendations identified in the NES. The NEP included a fast-paced grid connection program to increase connectivity nearly five-fold, to achieve 65 percent of access through grid connectivity by 2025.

The NEP was then updated—the first electrification program in Sub-Saharan Africa to take this important step—and re-launched as NEP 2.0 in March 2019. NEP 2.0 considers changes on the ground and taps into updated analytics. An integrated and complementary off-grid access program targeted the remaining

35 percent of the population with pre-electrification and long-term off-grid solutions, individual solar home systems, and mini grids. Access targets were based on the ESMAP [Multi-Tier Framework](#), which looks at the multiple dimensions of access to capture detailed and accurate information about the quantity and quality of energy services.

The rollout of new connections under NEP 2.0 were also based on geospatial analysis that identified the least-cost technology based on location and available demand estimates, generated from the ESMAP supported geographic information system (GIS). The state-of-the-art GIS optimized planning for both on-grid and off-grid infrastructure and continues to act as a monitoring and evaluation platform for the program.

## OPTIMIZING ELECTRIFICATION EFFORTS

An investment prospectus set forth guidance for future investments in the sector and the syndication of financing requirements for service delivery under the NEP. The World Bank's [US\\$375 million Ethiopia Electrification Project](#) (ELEAP), which is supporting the NEP's three pillars: grid electrification, off-grid services, and sector capacity and institutional reform, used this guidance to determine the best grid and off-grid investments. The holistic, sectorwide approach optimized electrification efforts to maximize the development impact of electricity services.

Launched in 2018, the project directly finances new electricity connections for over one million households—nearly doubling the rate of electrification to reach over 50 percent of the population. Already, more than 100,000 new connections have been established and 500,000 people in connected areas are receiving enhanced services. The project will also provide over 250,000 people with off-grid electricity services through a combination of standalone solar home systems and mini grids—of which the first 12 were tendered in May 2019.

## GENDER IN ENERGY

As part of the NEP and NEP 2.0, the Government committed not only to ensuring that women and girls benefit from modern electricity services, but that they would also have more opportunities within equitable energy institutions. Based on the idea that empowering women

is smart economic policy, a coordinated approach between the World Bank and the Government, resulted in the Closing Gender Gaps Across Ethiopia's Energy Sector initiative. The unique initiative incorporated an ESMAP supported gender analysis, high-level policy advice, and the mobilization of significant financial resources to transform gender equality across the entire US\$1.8 billion World Bank energy portfolio in Ethiopia.

Energy experts, gender experts, and outside stakeholders all worked to identify the fundamental drivers of gender inequality in Ethiopia's energy sector. Country data, combined with findings from consultations, workshops and discussions with the government, utilities, universities, businesses, women's associations, microfinance institutions, and civil society organizations helped to identify existing gender gaps. These gaps centered on employment and leadership in technical fields, access to finance in the adoption of clean technologies, and exposure to gender-based violence in the workplace.

Based on the findings, ELEAP includes provisions to address occupational sex segregation across the sector's 14,000 employees, establish child-care facilities in utility offices across all 11 regions in Ethiopia, makes career development, management, and leadership training available for female staff, creates prevention and response programs for gender-based violence, and provides access to finance and promotion of female entrepreneurship in the off-grid market.

## DEDICATED FUNDING FOR OFF-GRID RENEWABLE ENERGY

ESMAP's Lighting Africa program designed the Market Development for Renewable Energy and Energy Efficient Product Credit Line, which is a revolving fund providing loans to private sector enterprises and microfinance institutions to expand the local renewable energy market and increase affordability of renewable energy products for households. In collaboration with the Development Bank of Ethiopia, the World Bank Electricity Network Rehabilitation and Enhancement Project (ENREP) established the financing facility in 2013 with US\$20 million and has since doubled the credit line to US\$40 million.



Source: <https://www.seforall.org/stories-of-success/ethiopia-electricity-access-through-innovative-partnerships>

The financing facility complements electricity grid connection programs, providing retailers credit to import and assemble renewable energy products—like solar lanterns and solar home systems, biogas digesters, and small wind turbines—and microfinance institutions with funding to disperse loans to families to purchase and install these products.

ESMAP's Lighting Africa provided a technical assessment of the credit line's performance for scale-up under NEP 2.0, including an off-grid market assessment, private sector consultations, and expert technical and financial advice for design and scale-up.

Twenty-six private sector businesses are currently using the credit line, importing and selling solar products that meet Lighting Global Quality Standards, and fourteen microfinance institutions are currently providing energy-financing options to households using funds accessed through the credit line. The credit facility has a remarkable zero percent rate of default. The first of its kind, the credit facility is now being replicated in almost 20 countries across Africa.

To date, the credit line has successfully supported the replacement of kerosene lamps with 1.2 million solar products, installed more than 8,600 biogas digesters for cooking and agriculture purposes, and provided loans through microfinance institutions to more than



Source: Addis Ababa at night by Jakob Polacsek.

170,000 rural households, 60 percent of which are female-headed.

Linked to ENREP, the World Bank's Carbon Initiative for Development has agreed to purchase the emissions reductions resulting from the distribution of 2.8 million solar lanterns and more than 200,000 solar home systems, providing US\$11.1 million in revenue from carbon finance. These funds will be used to support a warranty tracking and enforcement system, and battery replacement and maintenance incentive scheme that will further bolster the market for renewable energy products.

## WAY FORWARD

While Ethiopia benefits from vast amounts of renewable hydropower, the country also has largely untapped

resources, like solar, wind, and geothermal. With the US\$200 million Renewable Energy Guarantees Program (REGREP), for the first time in the country's history, the World Bank will support the Government's ongoing power sector reforms and leverage private sector financing for renewable energy generation.

REGREP will support the development of over 1,000 MW of solar and wind energy. The Government utilized ESMAP's Global Wind Atlas to identify areas with high potential. In collaboration with the government of Denmark, ESMAP is financing wind measurements in 17 sites for validation, including 6 priority sites for a future wind Independent Power Project.

In line with the integrated, sectorwide approach adopted in the NEP, the project will ensure adequate supply for the electrification targets, increase climate resilience by diversifying the electricity supply, boost industrialization through clean energy growth, and promote regional integration through the Eastern Africa Power Pool.

## A STRONGER ENERGY SECTOR

Ethiopia is emerging as a role model for energy development in Sub-Saharan Africa and around the world. By addressing the challenge of access from many angles, Ethiopia has made and continues to make great strides toward reaching universal access. By partnering with ESMAP and the World Bank, the Government of Ethiopia has successfully implemented comprehensive programs and investments. Working together, these instruments have helped to achieve an overall program for providing electricity to the whole country, created markets for off-grid solar products, developed gender-based solutions within the energy sector, and incorporated private sector financing for untapped renewable resources—ultimately transforming the entire energy sector.

### ESMAP MISSION

**The Energy Sector Management Assistance Program (ESMAP) is a global knowledge and technical assistance program administered by The World Bank.** It provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Canada, ClimateWorks Foundation, Denmark, the European Commission, Finland, France, Germany, Iceland, Italy, Japan, Lithuania, Luxembourg, the Netherlands, Norway, the Rockefeller Foundation, Sweden, Switzerland, the United Kingdom, and the World Bank.