
Scaling Up Renewable Energy

Innovating for Impact

Executive Summary

“I want to share with you that today we have had great success in the second renewable energy auction in the country... The renewable energy revolution is ongoing and Colombia is seen as one of the most attractive countries in Latin America for investment in this type of clean energy sources.”

— Colombia President Iván Duque Márquez

As prices for clean energy technology continue to fall, developing countries are increasingly taking advantage of innovative methods to deliver more power to their people. Through the Scaling Up Renewable Energy (SURE) project, USAID is supporting partner countries with the policy, planning, procurement, and private sector engagement strategies needed to realize a renewable energy future.

In FY 2019, SURE guided governments, electric utilities, private energy developers and other energy entities to plan strategically, train inclusively, and take decisive action toward reducing energy costs and encouraging private investment as part of their journey to self-reliance.

MAKING RENEWABLE ENERGY A REALITY

Colombia was the most visible beneficiary of SURE support last year, as evidenced through the enthusiasm of President Duque's statement at the close of the country's first successful renewable energy auction. An auction is a transparent and competitive process for awarding new energy contracts. Colombia's auction awarded contracts that will boost the country's renewable energy capacity by nearly 1,400 megawatts at historically low prices. In one year, SURE co-hosted 13 events that trained 1,200 participants from 13 countries.

PLANNING FOR A RENEWABLE ENERGY FUTURE

SURE also supported several partner countries with their goals to expand renewable energy generation and grid integration. The SURE team:

- Delivered capacity-building workshops, knowledge exchanges, and trainings in 20 countries
- Launched a variable renewable energy (VRE) forecasting pilot program in Indonesia
- Delivered white papers on strategic energy resource planning, system operations and VRE forecasting
- Published multiple design and planning tools for auction practitioners

ADVANCING GENDER EQUALITY

Through SURE, USAID also works with electric utilities to improve gender equality, which studies show can increase investment in renewable power generation. Over the last year, USAID's Engendering Utilities program added ten new partner utilities from nine countries, and now has 17 partners in 14 countries committed to advancing opportunities for women in a traditionally male-dominated sector. The program is expanding its reach to the water sector and will add 10 new partner utilities next year.

LOOKING AHEAD TO YEAR 3

SURE planted important seeds for renewable energy growth in Bangladesh and Indonesia, and plans to deliver regional events in Asia and Africa to discuss global best practices in competitive procurement and innovations applicable to each region. SURE continues to work in countries where achieving large-scale clean energy deployment is a priority for reducing emissions and increasing energy security.

Innovating to Improve Competition: Renewable Energy Auctions

“The success of the renewable energy auction is also the fruit of the valuable cooperation and technical assistance that we received from cooperation agencies and multilateral banks, thank you USAID, IDB, World Bank and UK in Colombia and everyone who supported this transformation.”

— María Fernanda Suárez, Minister of Mines and Energy, Republic of Colombia

Colombia’s Minister of Mines and Energy’s (MME) public expression of gratitude is a testament to the efforts put forth by SURE throughout FY 2019 to lay a strong foundation for the country to hold its first successful renewable energy auction. An auction is a competitive procurement process that allocates award contracts based solely on the bids submitted according to transparent award rules. These positive results demonstrate the effectiveness of USAID’s support to drive clean energy uptake, reduce prices, and spur economic growth.

Throughout the year, SURE engaged partner governments, energy ministries, utilities, regulators, system and market operators, and the private sector through knowledge sharing and exchange, institutional support, and in-country technical assistance to bring reliable, clean energy to scale.

KNOWLEDGE SHARING AND EXCHANGE

SURE developed multiple tools and platforms to strengthen and engage our partners on current trends and practices in designing and holding renewable energy auctions:

- **Designing Renewable Energy Auctions: A Policymaker’s Guide** outlines advantages to competitive procurement and introduces key auction design concepts and trends. “Why Choose Auctions?” is the first installment of a Quick Read collection of special reports highlighting the latest global trends in RE procurement.
- **Regional Auction Dialogues** will facilitate knowledge exchange among participants from surrounding countries. In FY 2020, SURE plans to hold dialogue events in Asia and Africa to discuss global best practices and innovations applicable to the region to achieve clean energy targets.

INSTITUTIONAL SUPPORT

SURE assisted in delivering four tailored workshops for auction implementers in Kazakhstan, Senegal, and Tanzania, in many cases, supporting other long-term USAID mechanisms active in-country. SURE’s delivery strategy included informing stakeholders of specific global trends that could address key barriers to the procurement and financing for RE

investment. SURE has identified many common themes and solutions to RE auctions that are broadly applicable across the globe. The workshops also engaged participants in auction simulations to make key learnings more tangible and interactive. Kazakhstan and Tanzania are continuing RE auctions with the assistance of other USAID mechanisms.

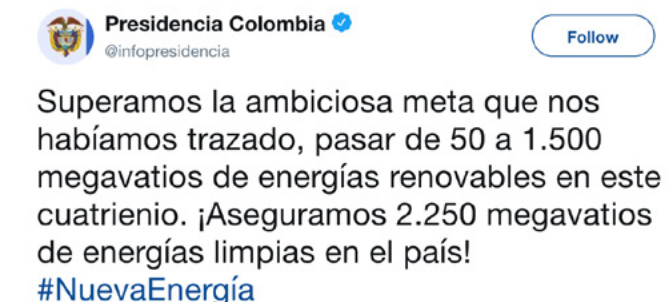
HANDS-ON TECHNICAL ASSISTANCE

SURE provided extensive, in-country, hands-on technical assistance in auction design and implementation in Colombia, and is laying the groundwork for innovative renewable energy auctions in India.

India

To meet its RE target of 40 percent of total installed RE capacity by 2030, India will auction 40 gigawatts (GW) of solar and wind capacity every year until 2028. However, controlling system operation costs will become critical as more RE generation is added to the grid. To minimize these costs, SURE is partnering with India’s national energy entities to explore system-friendly RE competitive procurement such as time and locational incentives and hybrid procurement. The project published a [white paper](#) on this topic. SURE now seeks to prioritize and implement these recommendations in collaboration with national or regional entities in charge of RE procurement.

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Colombia

The most significant results in competitive procurement came from SURE’s support of Colombia’s second renewable energy auction, which awarded contracts for nine projects that will provide 1,374 megawatts (MW) of new wind (1,077 MW) and solar (297 MW) power generation, at a historic low price for the country of approximately \$28 per megawatt hour. The 22 awarded buyers will buy power at less than 70 percent of current bilateral contract prices.

The Government of Colombia seeks to reduce its dependence on hydropower and fossil fuels by integrating renewable technologies like wind and solar into their generation mix. To achieve the lowest possible prices for consumers, Colombia requested USAID support to plan and implement its first renewable energy auction. SURE helped tailor the auction to Colombia’s unique needs, incorporating the government’s policy goals of increased energy system resilience and security through diversification, reduced greenhouse gas emissions, and cost reduction.

SURE’s assistance included assessing the Colombian energy sector, drafting regulatory documents, and informing the design process. Additionally, SURE coordinated with Bloomberg New Energy Finance to hold events in Bogotá and New York City focused on attracting U.S. private sector developers to bid in the auction. Approximately 150 companies participated in the events, demonstrating strong commercial interest in the Colombia opportunity.

SURE developed an [online library](#) to house key auction documents (in English and Spanish), along

with rules for bidder participation, and the contracts to be awarded to winning bidders. Throughout the auction process, USAID monitored trends and innovations in global auctions, and conducted study tours and workshops to help participants benefit from best practices.

The first auction, held in February 2019, resulted in no awards due, in part, to antitrust requirements set to ensure sufficient competition. To ensure future auction success, USAID interviewed all 12 selected buyers and sellers that participated in the first auction to determine options for a way forward. USAID’s assessment informed new rules for a second auction conducted in October 2019.

Between September 2018 and September 2019, USAID co-hosted 13 events that trained 1,200 participants, including 544 people from 13 countries via live stream, and 22 distributors and retailers (the buyers). Fifty-three companies applied to participate—27 generators (the sellers) and 26 buyers (representing about 95 percent of Colombia’s regulated demand in 2018).

The auction, held in October 2019, was deemed a resounding success and lauded by President Iván Duque as an “historic” achievement, setting the stage for further RE integration. Colombia’s enhanced capacity to provide reliable electricity supplies to its communities will not only drive the country’s economic growth and reduce costs to consumers, it will move the country further on its path to self-reliance, a positive outcome on multiple fronts.

Planning a Renewable Energy Future

Maximizing uptake of VRE resources requires systematic and strategic planning, as well as immediate changes in how electricity system operators and policymakers think of integrating new power into the grid. Getting it right empowers countries to deliver more affordable and reliable electricity to homes and businesses.

Through SURE, USAID is helping partner countries capitalize on improved generation technologies and falling prices to boost electricity supply and add more renewable energy.

In FY 2019, SURE advanced energy sector planning and VRE integration via direct support to Indian and Colombian energy sector stakeholders, and two white papers that address VRE grid integration challenges. SURE is putting these recommendations into practice by implementing a VRE forecasting pilot in Indonesia.

INDIA – PARTNERSHIP TO ADVANCE CLEAN ENERGY DEPLOYMENT (PACE-D)

At a time of intense demand for electricity and the introduction of disruptive technologies, India's energy sector is reconsidering how it procures and distributes electricity. Renewable energy planning serves a critical role in meeting the Government of India's ambitious target of adding 500 GW of RE to its electricity grid by 2030 to power socioeconomic activities that will result in a more self-reliant India.

Under SURE, USAID's PACE-D program is working at the national level with the Ministry of New and Renewable Energy (MNRE), and at the state levels with power distribution companies to improve India's RE planning processes and tools, and published a [white paper](#) on this topic.

In 2019, PACE-D forged partnerships with the states of Assam, Gujarat, and Jharkhand to improve planning capacity to integrate more RE through the development of new tools and methodologies. In each state, the program convened workshops to raise awareness of planning benefits and enabling regulatory frameworks for resource planning, and identify specific needs for capacity building. PACE-D

Integrating Renewable Energy into the Grid

is currently developing a software tool to inform long-term resource planning for each state.

COLOMBIA – TRANSMISSION EXPANSION DEFERRAL SUPPORT

In May, SURE, NREL, and USEA engaged Colombia's power sector planning agency (UPME) to deliver a two-day workshop on utility-scale battery energy storage. SURE, NREL and USEA convened energy practitioners from the ministry, the system operator, the regulator, the utility Electricaribe, and global storage experts to procure storage technologies which would defer a multi-million dollar investment in transmission infrastructure. As a result of this engagement, UPME is planning an upcoming procurement of 60, 40, and 20 MW of 4-hour battery storage in three areas of Barranquilla by the end of the year.

SURE is also working in Colombia to support utilities to scale distributed renewable energy (DER). DER is proving to be effective in delivering much needed clean, reliable electricity to consumers. DER is generated where it is consumed, often with technology owned by the consumer, such as solar home systems. However, rapid deployment of DER poses technical, regulatory, and operational issues to system operators and utilities, which are unable to see or control these resources. SURE supported the system operator and U.S. Energy Association to deliver a five-day training program in Bogotá, addressing DER integration challenges based on best practices and lessons learned from the United States and globally.

INDONESIA – VRE FORECASTING AND INTEGRATION PILOT

As Indonesia ramps up renewable energy generation, its power grids must plan for increasing amounts of intermittent supply from wind, solar, and other technologies. In South Sulawesi, challenges in integrating wind projects have resulted in curtailment (inability to deliver energy even though the resource is present) and interconnection delays. To mitigate these challenges, Indonesia's state-owned electricity company, PLN, requested support from USAID. SURE launched a VRE generation forecasting pilot with PLN in 2019 to procure forecasting services from international vendors and assess their accuracy. SURE will also help PLN design a complete, tailored process to incorporate the forecasts into dispatch decisions, supplemented by an evaluation of PLN's system readiness to automate VRE generation forecasting as part of its regular planning functions.

VRE WHITE PAPERS – ROADMAPS FOR PRACTITIONERS

Improving System Operations

Power systems are highly dynamic and are affected by a range of quickly-changing factors. Integrating VRE, which is itself variable in nature, to an already dynamic power system can pose challenges. To help energy sector actors overcome these challenges, SURE published a white paper that illustrates how improved system operations can increase the flexibility of power systems to integrate large amounts of VRE. The paper examines the experiences of national power systems in Colombia, India, Mexico, the Philippines, and Vietnam, and identifies system operations improvements that could help these countries better take advantage of historically low renewable energy prices.

Implementing VRE Forecasting

VRE forecasting has emerged as a cost-effective method for reducing the impacts of VRE integration on the grid and provides several key benefits that are essential to emerging market grid operators and regulators. SURE's VRE forecasting white paper explores the status of VRE forecasting in Colombia, India, Mexico, the Philippines, and Vietnam, and develops a best practice-based approach to inform system operators and regulators of the pivotal role of VRE generation forecasting as it relates to the overarching objective of integrating RE into their national grids.

Engendering Utilities

Ryan Kilpatrick for USAID



“In the energy sector, I want to see women be given a chance and have the opportunity to at least explore and to share their bright ideas, and to prove that it’s not only a man who can run an electric utility, but we as women can also lead them because we are empowered.”

— Nordjana Dipatuan-Ducol, General Manager, LASURECO, Philippines

GM Ducol’s vision moved one step closer to reality as she and more than 50 representatives from 17 electric utilities convened in Amsterdam this July for the Engendering Utilities Gender Equity Executive Leadership Program. Implemented through SURE, USAID’s Engendering Utilities program works directly with electric utilities to improve gender equality and boost business performance.

A FORCE FOR WOMEN’S ECONOMIC EMPOWERMENT

Engendering Utilities is a key component of the Women’s Global Development and Prosperity (W-GDP) Initiative launched by the White House. W-GDP is a United States Government-wide new approach to advancing women’s economic empowerment worldwide. W-GDP is the first-ever whole-of-government initiative focused on advancing women’s full and free participation in the global economy.

IN 2019, ENGENDERING UTILITIES WELCOMED:

 **10** new partner utilities from

 **09** countries in Africa, Asia, Europe, and the Caribbean

TODAY, ENGENDERING UTILITIES WORKS WITH:

 **17** partners in

 **14** countries



Ryan Kilpatrick for USAID

Engendering Utilities builds the capacity of utility leaders to implement gender equality interventions in their organizations through customized best practices, demand-driven coaching, and the Gender Equity Executive Leadership Program, designed and presented in partnership with Georgetown University’s McDonough School of Business. Enhancing utility operations through gender equality and other interventions can help create stronger and more resilient national energy sectors that are critical for economic growth and promoting a path to self-reliance. A [2012 UC Berkeley study](#) also shows that increased gender equality can boost investment in renewable power generation.

DELIVERING GENDER EQUALITY

Significantly updated and enhanced in 2019, Engendering Utilities’ *Delivering Gender Equality: A Best Practices Framework for Utilities* provides global best practices and resources to help utilities implement gender equality interventions throughout the employee life cycle. The updated framework and a related resource library are available via the [Engendering Utilities website](#).

LOOKING AHEAD...

Expanding Beyond Energy

In 2019, USAID announced the expansion of Engendering Utilities beyond energy into other sectors, including water and sanitation, to strengthen sustainable urban service delivery while creating tangible economic opportunities for women. As it expands to new sectors, the program is also scaling up, adding 10 more utility partners by the end of 2019.

REACHING NEW HEIGHTS

Nigeria’s Eko Electricity Distribution Company (EKEDC) – an Engendering Utilities partner since 2017 – hired its first female line workers, increasing opportunities for women in the country’s traditionally male-dominated energy sector. This move is a progressive step and just one of many successes of EKEDC’s participation in Engendering Utilities.



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SURE by the Numbers



CLEAN ENERGY

674

people trained in clean energy supported by U.S. Government assistance

46

institutions with improved capacity to address climate change issues



RENEWABLE ENERGY AUCTIONS

3

policies, regulations, and laws in support of auctions

18

workshops and events convened

1,961

auction stakeholders

\$1.3 bn

USD leveraged

4

auctions supported

1,374

MW of solar and wind energy awarded

11,306,500

tCO₂e avoided through 2030



GENDER

51

change agents from

17

utilities trained to deliver gender equality interventions to more than

38,000

utility employees

WHERE SURE WORKS

Bangladesh
Dominican Republic
Colombia
El Salvador
Georgia

Ghana
India
Indonesia
Jordan
Kazakhstan

Kenya
Kosovo
Liberia
Malawi
Mozambique

Nigeria
North Macedonia
Philippines
Senegal
Tanzania

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