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ASIA EDGE
Enhancing Development and Growth through Energy
The U.S. Government's Indo-Pacific Energy Initiative



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INDO-PACIFIC STRATEGY (IPS)

ASIA ENHANCING DEVELOPMENT AND GROWTH THROUGH ENERGY (ASIA EDGE)

2020 ANNUAL REPORT: SUMMARY OF RESULTS

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ACRONYMS

ACE	Automated Commercial Environment
ADS	automatic dispatch system
AGC	Automatic Generation Control
AGP	U.S.-Asia Gas Partnership
AIMS	ASEAN Interconnection Masterplan Study
AQI	Air Quality Index
ASEAN	Association of Southeast Asian Nations
BCA	Bank Central Asia
BERC	Bangladesh Energy Regulatory Commission
BESS	Battery Energy Storage Systems
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
CBET	Cross Border Electricity Trade
CC	Cross-cutting
CERC	Central Electricity Regulatory Commission (India)
COVID-19	Coronavirus disease 2019
CPA	Clean Power Asia (USAID/RDMA)
CSE	Civil Society Engagement
DIS	Development Information Solution
DISCOMS	Power distribution companies (India)
DPPA	Direct Power Purchase Agreement
DSM	Deviation settlement mechanism
DVP	Vietnam Rooftop Solar Promotion Program Policy
EDGE	Asia Enhancing Development and Growth Through Energy
EE	Energy Efficiency
EEE for SEA	Enhancing Equality in Energy for Southeast Asia
EESL	Energy Efficiency Services Limited (India)
ERAV	Electricity Regulatory Authority of Vietnam
ERC	Energy Regulatory Commission (Nepal)
ERPP	Bangladesh Energy Regulatory Partnership Program
EV	Electric Vehicle
EVN	Vietnam Electricity
FDI	Foreign Direct Investments

FY	Fiscal Year
GESI	Gender and Social Inclusion
GHG	Greenhouse gas
GOB	Government of Bangladesh
GOI	Government of India
GON	Government of Nepal
GSECL	Gujarat State Electricity Corporation Ltd.
GVN	Government of Vietnam
GW	Gigawatt
HPP	Hydro Power Project (Nepal)
ICED II	Indonesia Clean Energy Development II
IEX	India Energy Exchange
IPS	Indo-Pacific Strategy
IPPAN	Independent Power Producers Association, Nepal
JICA	Japan International Cooperation Agency
MEL	Monitoring, Evaluation and Learning
MEMR	Ministry of Energy and Mineral Resources (Indonesia)
MOEWRI	Ministry of Energy, Water Resources, and Irrigation (Nepal)
MOIT	Ministry of Industry and Trade (Vietnam)
MOP	Ministry of Power, India
MW	Megawatts
MWG	Mobile World Investment Corporation, Vietnam
MWh	Megawatt hours
NARUC	National Association of Regulatory Utility Commissioners
NEA	Nepal Electricity Authority
NEC	National Energy Council, Indonesia
NHDP	Nepal Hydropower Development Project
NREL	National Renewable Energy Laboratory (U.S. Department of Energy)
NTPC	National Thermal Power Corporation (India)
OIBN	Office of the Investment Board of Nepal
OU	Operating Unit
PCS	public charging stations
PDA	Project Development Agreement
PIRS	Performance Indicator Reference Sheets

PLN	National Development Planning Agency, Indonesian State-Owned Electricity Company
PPA	Power Purchase Agreements
PSE	Private Sector Engagement
PV	Photovoltaic
RDMA	Regional Development Mission for Asia
RE	Renewable Energy
RTC	Round-the-clock
RTM	Real time market
SAFIR	South Asia Forum of Infrastructure Regulators
SAGE	South Asia Group for Energy
SAREH	South Asia Regional Energy Hub (India)
SARI/EI	South Asia Regional Initiative for Energy Integration
SAWIE	South Asia Women in Energy (India)
SBD	Standard Bidding Documents
SDG	Sustainable Development Goal
SECI	Solar Energy Corporation of India
SPP	Sustainable Public Procurement
SURE	Scaling Up Renewable Energy Activity
TOC	Theory of Change
USAID	United States Agency for International Development
USG	United States Government
V-LEEP	Vietnam Low Emission Energy Program
VUES	Vietnam Urban Energy Security
VRE	Variable Renewable Energy
WPCB	Wind Power Capacity Building Activity

INTRODUCTION

Asia Enhancing Development and Growth through Energy (EDGE) is a whole-of-government initiative launched in July 2018, designed to grow sustainable and secure energy markets throughout the Indo-Pacific region, as part of the Indo-Pacific Strategy (IPS). USAID plays a leading role, helping its Indo-Pacific partners expand energy access, promote energy diversification and trade, and strengthen energy security across the region.

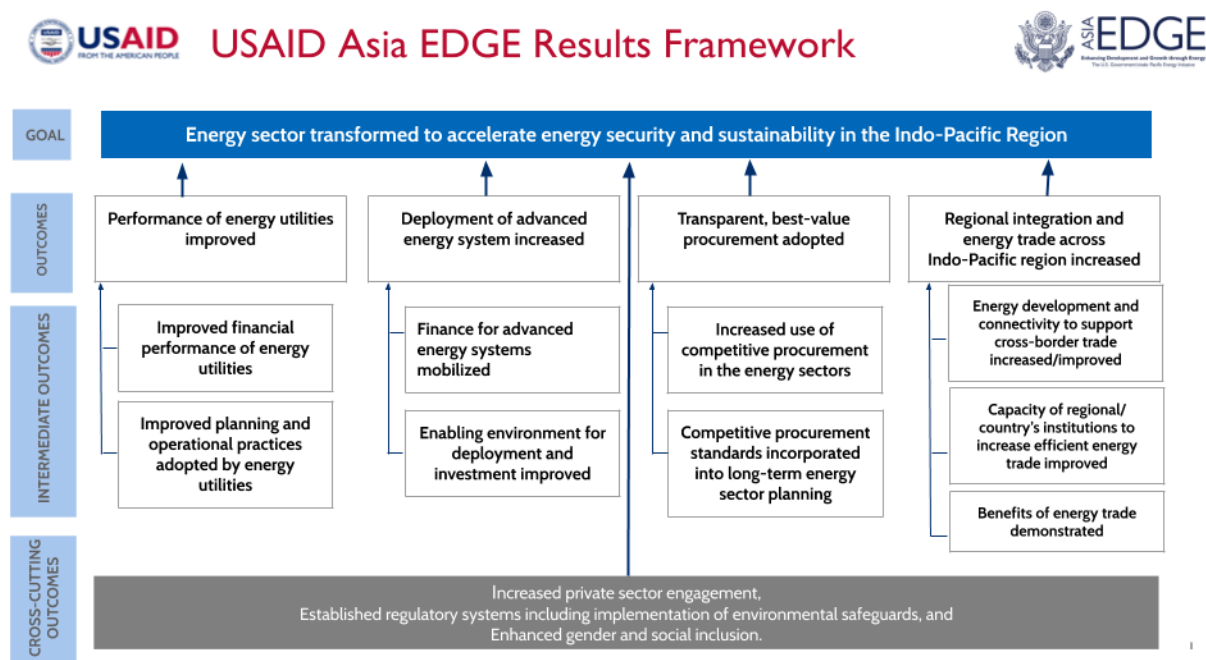
The overall goal of Asia EDGE is to transform the energy sector to accelerate energy security and sustainability in the Indo-Pacific region; the goal is supported by four interconnecting Outcomes, related Intermediate Outcomes, and three Cross-cutting Outcomes.¹ The Theory of Change (TOC) posits that:

IF countries in the Indo-Pacific region pursue efforts to improve the performance of their energy utilities (Outcome 1), increase the deployment of advanced energy systems (Outcome 2), adopt transparent and best-value energy procurement practices (Outcome 3), and enhance energy trade and regional integration (Outcome 4);

THEN the energy sector will be transformed [integrated, smart, secure, competitive market-driven, allowing more private sector investment], leading to energy security and sustainability in the Indo-Pacific region (Goal).

The goal of Asia EDGE and the four Outcomes attached to this TOC are represented in the Results Framework below.

FIGURE I. ASIA EDGE RESULTS FRAMEWORK



The Asia EDGE TOC was developed with three important contextual assumptions: (1) that economic growth continues to grow globally and in the region without any major economic crises; (2) the political environments in Indo-Pacific countries are stable; and (3) foreign investment, especially from the U.S., continues flowing to the region. These assumptions are an important lens through which to view USAID

¹Additional programming background and the public Asia EDGE Fact Sheet are found here: <https://www.usaid.gov/energy/asia-edge>

results to date, given changing realities in terms of economic growth, political stability, and foreign investment in the Indo-Pacific region.

This annual report synthesizes quantitative and qualitative data collected from the IPS performance monitoring and reporting system originally designed in 2019 and updated in 2020. Data consist of performance indicator and narrative submissions from relevant IPS Missions and Operating Units (OUs) for the 2020 Fiscal Year (FY) reporting period. Refer to Annexes I-III for more detailed syntheses of all results, including quantitative indicator results. More details about the data collection and analysis approach, including original data submissions and data collection instruments, are found in [Annex III, Methodology](#).

KEY RESULTS AND ACHIEVEMENTS

In FY 2020, all reporting Asia EDGE Missions indicated high-level results under at least one Outcome. Some lower-level but still salient results are included where higher-level results were not yet available. Summary results are presented below according to the relevant Asia EDGE Goal, Outcome, or Cross-cutting Outcome. Comparisons to FY 2019 reporting are provided where relevant; for the most part, FY 2020 results expanded upon or continued from previous FY 2019 achievements.

Goal: Energy Sector Transformed to Accelerate Energy Security and Sustainability in the Indo-Pacific Region. In FY 2020, Regional Missions supported regional integration and demonstrated USAID’s convening power to support the Asia EDGE Goal in South Asia and Southeast Asia. Bilateral Missions also contributed a number of high-level results, as more straightforward Asia EDGE performance indicators. Most impressively, Asia EDGE Missions mobilized a combined total of \$1.37 billion in investment for clean energy in FY 2020.

USAID has been instrumental in establishing power trade in the South Asia region, which has increased to 3,800 megawatts (MW) since 2000. Over several years, USAID’s programming in the region supported key transmission corridors between India and Bangladesh, and India and Nepal, as well as regional power projects. In total, USAID/India efforts in FY 2020 led to trading 7,489,000 megawatt hours (MWh) of power traded in South Asia, facilitated 5,184 MW capacity of renewable energy (RE), saved 227,063 MWh of electricity, and mobilized over \$128 million in clean energy investments.² Though COVID-19 negatively affected the South Asia power sector, the pandemic also exemplified the benefits of an integrated grid. Integrating (and securing) the grid is especially critical in situations where power transmission and energy infrastructure become areas of geopolitical clashes, as seen in the China-India border skirmishes in the Ladakh region in the summer of 2020.³

In Southeast Asia, USAID/RDMA mobilized nearly half a billion dollars in investment for clean energy (EG.12-4), as a result of the USAID Clean Power Asia (CPA) and the Advanced Energy Partnership for Asia Activities and primarily from domestic, private sector sources.⁴ The investment largely represents projects that build solar rooftops in Thailand and Vietnam, and a small amount (\$22,000) of in-kind contributions from the Hawaii Natural Energy Institute, World Resources Institute, and the Laos Ministry of Energy and Mines. As well, the CPA Activity contributed to 549 MW of installed generation

² SARI/E and GTG activities contributed the majority of these results. See quantitative results in Annex II for more details.

³ “China Appears to Warn India: Push Too Hard and the Lights Could Go Out.” NY Times, February 28, 2021. [China Appears to Warn India: Push Too Hard and the Lights Could Go Out](#) and “Battle in the Himalayas: China and India are locked in a tense, deadly struggle for advantage on their disputed mountain border.” NY Times, July 18, 2020. [Battle in the Himalayas](#).

⁴ \$496,481,000 was mobilized from private sector, domestic sources. Additional data notes indicate that the amount represents building solar rooftops.

capacity as a result of the Vietnam Rooftop Solar Promotion Program Policy (DVP), adopted in April 2020.⁵

Like in FY 2019 results, USAID/Nepal reported large sums of energy investment in FY 2020: USAID/Nepal mobilized \$700 million in private international investment through the Nepal Hydropower Development Project (NHDP) in Upper Trishuli (known as “UT-1”) which achieved financial closure in FY 2020 and construction has now started. Of the total, 216 MW of that power has achieved financial closure and NHDP’s support helped the Government of Nepal (GON) to include robust environmental, disaster management, and gender and social inclusion provisions in the Project Development Agreements (PDA).

In Bangladesh, USAID continued to focus on wind power generation largely by providing analytical support in the form of virtual workshops and tutorials on the RE Data Explorer, introduced in FY 2019 and used to inform real-time decisions in the wind energy market.⁶ In FY 2020, USAID/Indonesia’s ICED II Activity contributed to the installation of 140 MW of generation capacity, reached almost 1.5 million beneficiaries, and mobilized \$44.8 million of investment for clean energy (EG.12-4) by working with relevant Indonesian government institutions.⁷ These results, including the equitable distribution across comparable indicators (dollars, people, and MW or MWh), were very similar for both Missions in FY 2019. USAID/Vietnam’s flagship energy program, V-LEEP, ended in February 2021, and a new program (Vietnam Urban Energy Security, or VUES) was started during FY 2020, so results are in their nascent stage, but the five-year V-LEEP Activity exceeded its indicator targets over the course of its implementation.⁸

Outcome 1: Performance of Energy Utilities Improved. Transforming the energy sector involves improving the performance of energy utilities and their complex operations. As part of the World Utility Summit 2020, USAID/South Asia Regional convened a special South Asia-focused workshop to discuss challenges facing South Asian distribution utilities (including insolvency, smart meters deployment, digitalization, and adaptation to a more decentralized power system), which led to the drafting of a blueprint for a regional cooperation platform that supports utility modernization. This platform will be used as a knowledge network to facilitate cross learning between countries in the region and accelerate the adoption of best practices. The consensus to create a distribution utility network platform represents a key achievement for implementing the utility modernization focus of USAID’s Asia EDGE approach. USAID/India supported the Ministry of Power for the roll-out of 250 million meters by March 2023 through development of guidelines and standard bidding documents which were officially released by the National Smart Grid Mission in July 2020. In Indonesia, USAID supports the Government of Indonesia (GOI) in meeting its priorities for substantial energy infrastructure investment (as a means to improve economic growth and reduce poverty). To this end, USAID/Indonesia completed the Distribution System Planning Guideline in 2019, which the President Director of the Indonesian State Electricity Company (PLN) adopted by decree in May 2020. With the issuance of this Guideline, the World Bank released \$25 million under a loan program to increase access to electricity services and to improve the efficiency and reliability of these services throughout Indonesia.

⁵ The DVP policy stated that only projects reaching commercial operations by December 2020 would be eligible to receive the tariff waiver; hence, a large number of developers tried to expedite their project deployment within FY 2020, boosting MWs deployed for this reporting period. As a result of this policy, solar projects in Vietnam completed installation of 548.86 MW in Q3 and Q4 of FY 2020.

⁶ USAID contributed analytical support to inform the wind energy market in Bangladesh. See [Assessing the Wind Energy Potential in Bangladesh: Enabling Wind Energy Development with Data Products](#), September 2018.

⁷ Details about indicator values are provided in [Annex II](#).

⁸ See initial work plan document here: [VIETNAM URBAN ENERGY SECURITY \(VUES\), Inception Phase Work Plan, October 30, 2019](#).

Through the NHDP, USAID/Nepal worked with the U.S. Department of State and the Millennium Challenge Corporation to mobilize support to the Nepal Electricity Regulatory Commission (ERC). In FY 2020, NHDP supported the ERC to issue its first tariff determination on a retail tariff application filed by the NEA, making the tariff creation process transparent for the first time. Fair procedures gave all stakeholders the opportunity to participate in the process and to voice their views on regulatory matters. By the close of the project, the ERC had demonstrated that it is equipped to draft and issue approvals under numerous applications from regulated entities, including approvals for share offerings and Power Purchase Agreements (PPAs). The ERC also conducted multiple stakeholder and consumer engagement activities remotely during the COVID-19 lockdown. At the conclusion of NHDP, a new five-year activity, Urja Nepal, will be taking forward NHDP successes and working to assist the GON to create a financially viable electricity sector.

Outcome 2: Deployment of Advanced Energy Systems Increased. To improve overall performance, energy utilities must be equipped with the necessary technology and systems to manage energy generation, transmission, distribution and consumption. Results ranged from improved end-use technologies for electric vehicles to managing RE generation variability and providing a platform to share analytics and provide thought leadership in applying and managing energy technology.

USAID/India supported the design and implementation of a first-of-its-kind, large-scale public charging stations (PCS) project for electric vehicles. USAID assisted in the development of a viable business model (including a pricing mechanism favorable to landowners, power distribution utilities, charger operators, and consumers alike), then identified and prioritized sites for PCS installation and worked with the selected charger vendor to ensure timely implementation of the charging stations. As of April 2020, nearly 85 PCS had been installed in several cities, with plans to install more than 1,500 public chargers in at least 13 cities by March 2021. USAID's documented methodology, model documents, and capacity-building undertaken as a part of this program were included in the "Practitioner's Guide for Deployment of Public Charging Stations" which was launched at the January 2020 Regional Workshop on Power Distribution with senior government officials from five South Asian countries.⁹

Related to this, USAID/India and the Power Grid Corporation of India Limited finalized a two-year pilot test of a Battery Energy Storage Systems (BESS), which, through providing support in balancing renewable energy fluctuations in transmission grids, could solve reliability problems for Indian grid operators. The pilot demonstrated the suitability of two BESS technologies in performing various functions and established BESS' economic viability. BESS is an important tool for the South Asian energy transition and this pilot will help strengthen energy security in South Asia. In partnership with India's largest national power producer, the National Thermal Power Corporation (NTPC), and the Indian state of Gujarat, USAID/India conducted feasibility studies and test runs at low load and built the capacity of local engineers and plant operators to develop NTPC's fleet-wide strategy and the business case for policy and regulatory changes that would enable flexible operations. In FY 2020, USAID and the Government of India's Ministry of Power concluded a two-year pilot and operationalized India's first use of Automatic Generation Control (AGC) at the Sharavathi Hydropower Plant in Karnataka.¹⁰

Missions also provided significant performance indicator data, including 227,063 MWh of energy saved from energy efficiency, as reported by USAID/India, which represents the integration of energy efficient technologies and building efficiency measures. USAID/India in partnership with Energy Efficiency Services

⁹ They included Power Secretaries of Sri Lanka and Maldives; Additional Secretary of the Government of India, Managing Director of EESL, Joint Secretary of the Government of Nepal and the USAID Mission Director. More information available [here](#).

¹⁰ AGC is an advanced tool for grid operators to adjust generators' power output in response to changes in load and variability in the power system. The pilot showcased AGC in two types of generation, hydro and solar, to support India's roadmap for AGC adoption throughout the country to balance the supply and demand for energy in real-time.

Limited (EESL) launched a new initiative in response to the COVID pandemic for healthy and energy efficient buildings called 'Retrofit of Air Conditioning to Improve Air Quality for Safety and Efficiency' and designed and implemented 3 pilots in the offices of the Ministry of Power, the Ministry of Home Affairs and EESL. The initial results show nearly 98 percent improvement in indoor Air Quality Index (AQI) compared to the outdoors. The initiative was formally launched in July 2020 by the Honorable Minister for Power, Mr. R. K. Singh (more details in [Annex II](#)).

One of two regional Missions, USAID/RDMA, supported multiple training events and conferences covering clean energy technologies, policy frameworks, and finance and investment in Southeast Asia.¹¹ RDMA's role of "convener" as the USAID Southeast Asia EDGE Hub culminated in the Asia EDGE Power Sector Learning series webinars, available on the USAID [Southeast Asia EDGE YouTube channel](#). Presenters included experts from the U.S. National Renewable Energy Laboratory (NREL), USAID Clean Power Asia, USAID Vietnam Low Emission Energy Program, the Clean Energy Investment Accelerator, and others. These webinars covering renewable energy project financing, advanced deployment of modern energy technologies, and corporate procurement practices topics, delivered specialized virtual training to over 830 power sector stakeholders from 39 countries around the globe, demonstrating USAID's ability to extend its reach to share U.S. and regional best practices throughout Asia.

Outcome 3: Transparent, Best-value Procurement Adopted. Financial decisions that impact national energy projects rely on sound procurement practices and policies.

In India, USAID analysis and recommendations influenced the nature of competitive energy bidding. After the successful bid of a 1.2-gigawatt (GW) time-block tender worth \$1 billion in January 2020, the Solar Energy Corporation of India (SECI) launched another bid in March 2020 for 5 GW of round-the-clock power worth \$4 billion. USAID provided lessons learned and global best practices in innovative and system-friendly competitive bidding to SECI to incorporate into these tenders. The SECI bid marked a significant step towards system-friendly procurement of renewable energy in India that will allow power distribution companies (known as DISCOMs) to procure more renewable electricity at reduced generation and integration costs. Based on the success of "round-the-clock" (RTC) power tenders, the Ministry of New and Renewable Energy announced its intention to only use RE auctions for RTC power and RE hybrid projects (e.g. those combining wind and solar power to generate electricity during day and night). This move is expected to make clean power more competitive against traditional thermal power plants. The new procurement approaches, recommended by USAID, address RE challenges including variability, limited hours of supply, and low-capacity utilization of transmission infrastructure.¹² USAID/India, in partnership with United Nations Environment Programme (UNEP), developed the Sustainable Public Procurement (SPP) framework for India with technical specifications for room air conditioners as the first product to be incorporated for SPP. This will be integrated in the public procurement portal Government e-Marketplace for launching green air conditioners.

In FY 2020, USAID/Nepal supported the development of policies and training to governmental and private stakeholders that favor financial sustainability in the energy sector. First, in collaboration with other development partners, USAID's NHDP Activity provided further drafting support to MOEWRI and other GON institutions to develop an Electricity Act (including competition for projects and markets, mandating third-party access to networks, establishing a new electricity trader under the

¹¹ For one event, the CPA Activity launched a renewable energy learning series that opened a dialogue to help USAID's regional partners make clear, well-informed choices regarding energy sector investments and unleash Southeast Asia's abundant renewable energy resources. On March 25, 2020 the first webinar on the topic of distributed solar policies engaged nearly 90 participants. On April 29, 2020, 300 participants discussed industry best practices in financing of large-scale solar, wind, and biomass plants. CPA energy experts also participated in multiple online international conferences as thought leaders.

¹² The Director of SECI has acknowledged this support from USAID's PACE-D 2.0 RE Activity via a public platform.

regulatory control of the ERC, the development of a least-cost generation plan, and a plan to more effectively allocate Nepal's water resources).¹³ The same Activity supported transparency when raising foreign direct investment by supporting the GON to develop an open, transparent approach for selection of potential projects based on competitive procurement standards, while including a mechanism to allocate compensation for locally affected communities. This guidance resulted in the GON drafting the Upper Trishuli-I (UT-I) Project Development and Power Purchase Agreements, which increased the use of competitive procurement in the energy sector and is the first Foreign Direct Investments (FDI) hydropower project to employ conventional commercial financial mechanisms with respected international lenders such as World Bank Group members, Korean and European institutions, and the Organization of the Petroleum Exporting Countries (OPEC) Fund for International Development.

Outcome 4: Regional Integration and Energy Trade Across Indo-Pacific Region Increased.

Regional integration and energy trade involves coordination of both the development and diplomacy arms of foreign assistance. Regional Missions provided the most salient results in this area.

As part of the Japan-United States Strategic Energy Partnership (JUSEP) and Japan-U.S.-Mekong Power Partnership (JUMPP), USAID/RDMA supported regional integration through collaboration with other agencies and work on processes and multilateral power trade discussions. Together with the Japan International Cooperation Agency (JICA), USAID hosted a workshop for donors (including Japan and New Zealand) and Lao PDR government counterparts to discuss how to strengthen power generation and interconnection planning in Lao PDR and facilitate electricity cross-border trade in the region. This collaboration provided a critical opportunity to share technical information that can be used across the projects to further coordinate transmission planning efforts. The joint workshop also highlights the Japan-U.S. shared commitment to enhance regional power trade and integration—for a free, open, and stable electricity market.

To advance Asia EDGE's regional energy trade and integration goals, USAID's South Asia Regional Initiative for Energy Integration (SARI) Activity focused on accelerating power trade in the region by transitioning from bi- to tri- and multilateral trading modes and establishing a more integrated regional power market. In sheer numbers, SARI's assistance resulted in the trade of 7.4 million MWh of electricity in South Asia. In FY 2020, the program organized workshops in Bhutan, India, Bangladesh, and Nepal and worked on building national institutions' capacities in Bangladesh, Bhutan, and Nepal, countries already connected to the Indian grid, to establish a future power trading entity and participate in the Indian power exchange.

Moreover, USAID supported the Indian national regulator, CERC, by providing detailed modelling and market simulations to test options, to both validate and refine design parameters for a real time market (RTM), which will enhance efficiency in power market, support cross-border electricity trade among South Asian countries and create a regional power pool benefiting producers and consumers in participating countries.¹⁴ USAID also supported the Indian system operator in designing the framework

¹³ The Cabinet has since presented the bill to Parliament for enactment. When enacted, these new provisions of the act will increase transparency in energy procurement, increase market access, and increase efficiency in the electricity sector, resulting in an electricity sector that is more reliable, affordable, and sustainable.

¹⁴ RTMs enable system operators, power generators, and buyers to make supply and demand decisions based on the actual needs of the moment rather than forecasts, which inevitably include margins of error that translate into higher costs for consumers. The Indian Central Electricity Regulatory Commission (CERC) regards RTM's introduction as a critical step toward establishing a more reliant electricity network in the country and the South Asian region. USAID supported CERC to draft its Statement of Reasons, and compile and respond to stakeholder comments, as CERC amended three regulations — the Indian Electricity Grid Code Regulations, Power Market Regulations, and Open Access in Inter-State Transmission Regulations — to introduce the RTM framework. USAID also coordinated international knowledge exchanges for CERC, the national load dispatch center and other key stakeholders, which secured needed buy-in across India's power sector.

for an IT- based market participant registration system to aid RTM implementation. Additionally, USAID launched an energy coordination and communication hub in South Asia. The hub engineered a meeting of South Asian DISCOMs, which agreed to establish a regional Distribution Utility Network to facilitate knowledge sharing to accelerate their transition.

USAID continued to engage regional bodies, such as the South Asia Forum of Infrastructure Regulators (SAFIR) and the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC).¹⁵ The program helped establish a separate regulator working group under SAFIR, develop a draft common minimum grid code, identify regulatory interventions for grid discipline, and develop a regulatory roadmap for electricity trade in South Asia. The program also organized a conference with SAFIR on energy cooperation in South Asia and an executive exchange for South Asian regulators to participate in public hearings in India. Finally, the program initiated two independent regional forums, the South Asia Forum for Transmission Utilities and South Asia Forum for System Operators, and is currently finalizing power trade frameworks in consultation with member countries.

Cross-cutting Outcome: Private Sector Engagement. Through CPA, USAID/RDMA leveraged a diverse range of private partnerships to accelerate deployment of clean energy solutions across the region. In FY 2020, the Activity more than doubled its Year 4 targets by facilitating \$590 million in investments to add 606 MW of new RE generation capacity. This includes \$8.13 million (in investment) and 8.75 MW of solar rooftop capacity on nine Big C hypermarket stores in Thailand. CPA also helped structure Sermuang Power Corporation’s \$115 million, 48 MW wind power project in Vietnam.

Additional details of FY 2020 results are included in Annex I, Programming Highlights by Goal or Outcome. All OU results are summarized by Goal, Outcome, and Cross-cutting Outcome below in Table I.

TABLE I. OU RESULTS BY GOAL, OUTCOME, OR CROSS-CUTTING OUTCOME

OU	Goal, Outcome, or Cross-Cutting Outcome and Result
Bangladesh	<ul style="list-style-type: none"> ● Goal: The WPCB Activity and the SURE Activity organized a four-part virtual workshop on the wind industry, with emphasis on the current market and making procurements. ● Outcome 2: The SURE Activity published two studies on the most critical challenges hindering grid-connection and recommendations for the future. ● Outcome 3: USAID’s Bangladesh Energy Regulatory Partnership Program organized a workshop on dispute resolution. ● Outcome 4: USAID/Bangladesh and USAID/India organized the first conference on Enhancing Regional Energy Cooperation in the BIMSTEC Region. ● CC-1: USAID partnered with NARUC and provided technical assistance to the BERC under the Bangladesh Energy Regulatory Partnership Program (ERPP), including regulatory oversight and enhancing BERC’s dispute resolution process. ● PSE: WPCB hosted a private sector roundtable to better understand the key challenges and barriers to market entry in Bangladesh. ● CSE: USAID actively engaged with energy focused civil society entities such as academia, research organizations, NGOs/Non-profit organizations, and industry associations (Bangladesh Independent Power Producers’ Association, Energy Department of the Consumers Association of Bangladesh, Bangladesh Solar and Renewable Energy

¹⁵ In FY 2021, USAID will conclude several bilateral activities and transition programming into a new regional initiative, the South Asia Regional Energy Program. USAID/India will expand work under the two other regional initiatives, SAREH and SAGE, to harness U.S. energy sector capacity. USAID will also expand two energy activities focused on air pollution mitigation into new Indian geographies.

OU	Goal, Outcome, or Cross-Cutting Outcome and Result
	<p>Association) through the SURE and WPCB Activities to inform white papers and capacity building activities.</p>
<p>India¹⁶</p>	<p>USAID/India Results:</p> <ul style="list-style-type: none"> • Outcome 1: USAID modernized dilapidated electric utilities and supported the roll-out of pre-paid smart meters nationally. USAID also developed a framework for the government of India to establish a Smart Grid Knowledge Center. • Outcome 2: USAID implemented four initiatives to support distributed solar power. • Outcome 3: USAID supported improved energy procurement processes in India by providing analytical and collaborative support. • Outcome 3: USAID developed the Sustainable Public Procurement framework with technical specifications for room air conditioners. • PSE: USAID collaborated with 7 institutions and 3 associations in the textile industry on clean-energy and skill-building. • CSE: USAID/India launched the Think Tank Forum composed of a South Asian CSO network to build consensus and advocate on regional grid integration and cross-border power trade. <p>USAID/South Asia Regional results:</p> <ul style="list-style-type: none"> • Outcome 1: USAID convened a workshop on power systems, which resulted in a blueprint for a regional cooperation platform to support utility modernization. • Outcome 4: USAID co-organized a webinar that brought together leaders from power distribution companies across the region to discuss measures related to COVID-19, and developments in automation and digital technology. • Outcome 4: USAID/India and USAID/Bangladesh organized the first conference on Enhancing Regional Energy Cooperation in the BIMSTEC Region. • Outcome 4: USAID supported the drafting of an amendment to the Electricity Act of 2003, which acknowledges the role of cross border electricity trade for power generation and prescribes rules and guidelines to facilitate cross border trade. • GESI: USAID launched the South Asia Women in Energy Initiative to promote women's leadership and develop policies to advance gender equity in South Asian utilities. In FY 2020, the Activity organized a workshop on Gender Balancing for Renewable Energy Development, with 4,445 women receiving technical training in the energy sector. • CSE: USAID partnered with local, regional, and international think tanks and academic institutions including the University of Chicago and the Institute for Sustainable Communities, who are supporting innovative solutions to air pollution in South Asia.
<p>Indonesia¹⁷</p>	<ul style="list-style-type: none"> • Outcome 1: ICED II provided technical assistance and capacity building to the PLN, Government of Indonesia, and private sector institutions. This support included mobilizing investments, implementing projects, drafting feasibility study guidelines, and developing platforms for monitoring and evaluation. • Outcome 2: USAID supported the expansion of energy to rural areas with renewable resources to improve the operation of diesel generators and solar hybrid systems. • Outcome 2: USAID developed two new geospatial digital platforms that synchronize national and subnational electricity planning for the MEMR and NEC. • Outcome 3: ICED II developed standards and provided online training for a total of 231 PLN staff, which will ensure transparent and open procurements for renewable energy. • CCI: USAID conducted capacity building for 32 national and sub-national institutions,

¹⁶ This OU reports both USAID/India and USAID/South Asia Regional results. Results Narrative submissions were merged this year for both.

¹⁷ For USAID/Indonesia, Infrastructure Transaction and Assistance (or ITAN)-funded activity results are reported under the Asia EDGE Initiative and included in this report.

OU	Goal, Outcome, or Cross-Cutting Outcome and Result
	<p>resulting in 75 policies, standards, and guidelines in sustainable finance, energy planning, clean energy and power generation.</p> <ul style="list-style-type: none"> ● PSE: USAID mobilized a total of \$44.8 million in investment, including private investment of \$19.8 million for one biomass and one hydropower project financed by Indonesian banks, and a \$25 million loan from the World Bank for PLN to expand the distribution power grid. ● GESI: USAID trained a total of 2,396 people, of whom 28 percent were women, in energy conservation, energy planning, grid integration, GHG emission measurement, energy planning and renewable energy assessment.
Nepal	<ul style="list-style-type: none"> ● Outcome 1: NHDP provided tailored training and technical assistance to Nepal's Electricity Regulatory Commission, resulting in a communications strategy, bylaws, a discussion paper, and reports on various commission standards. ● Outcome 2: NHDP mobilized more than \$700 million public and private investment for Nepal's energy sector. ● Outcome 2: USAID assisted in drafting a bill on Energy Efficiency and reducing harmful environmental impacts. ● Outcome 3: NHDP supported policy development for an Electricity Act which includes a provision on competition for projects, mandates third party access to networks, and calls for the development of a least cost generation plan. This bill has been presented to the Parliament for enactment. ● Outcome 4: NHDP supported review of the 2003 Indian Electricity Act (with updates from 2014), which will enable the GON to identify steps and necessary actions to increase cross border electricity trade between the two countries. ● PSE: NHDP negotiated the UT-I project, which is the first Foreign Direct Investment hydropower project to employ conventional commercial financing mechanisms. ● CCI: In FY 2020, the NHDP continued providing transaction advisory support to facilitate the development and financial closure of large hydropower projects. ● GESI: NHDP helped develop a uniform approach the GON can use to provide compensation and benefits to people affected by local projects, including a mechanism to allocate local shares, and assisted to develop a standardized approach to disaster management to be implemented by all hydropower developers, and carried out the Free, Prior, and Informed Consent process, which protects indigenous peoples' right to participate in decision making. ● CSE: For the first time in Nepal's history, in FY 2020, electricity sector regulation was conducted through transparent and fair procedures that ensure the opportunity for all stakeholders to participate in the process and voice their views on regulatory matters.
RDMA	<ul style="list-style-type: none"> ● Goal: USAID launched the Enhancing Equality in Energy for Southeast Asia (EEE for SEA), a \$9 million, 3-year activity that will enhance gender outcomes in the energy sector. ● Outcome 1: CPA and the National Renewable Energy Laboratory (NREL) conducted modeling and planning to capture renewable energy potential. ● Outcome 2: CPA launched a renewable energy learning series and offered free online courses on modeling and forecasting approaches to electricity needs. CPA also launched the no-cost "Ask an Expert" service hotline. ● Outcome 3: USAID/RDMA supported Lao's first open solar power auction, yielding competitive prices and high-quality products. ● Outcome 4: USAID supported energy sector activities across Southeast Asia through the Asia EDGE Hub, which serves USAID/RDMA, USAID/Washington, bilateral missions, and IPs through technical support and strategic communication. The Hub conducted webinars and learning sessions that reached more than 830 stakeholders. ● PSE: CPA leveraged a diverse range of public partnerships to deploy clean energy

OU	Goal, Outcome, or Cross-Cutting Outcome and Result
	<p>solutions across the region, facilitating \$590 million in investments.</p> <ul style="list-style-type: none"> ● GESI: The Asia EDGE Hub developed a Southeast Asia annex to the USAID Gender and Energy 101 Toolkit, allowing personnel to better understand and address the formal and informal barriers to gender integration in Southeast Asia’s energy sector. ● CSE: The USAID Southeast Asia EDGE Hub, CPA, and the Advanced Energy Partnership for Asia worked primarily with partner country governments and the private sector in FY 2020 to support energy sector transformation across the Southeast Asia region.
Vietnam	<ul style="list-style-type: none"> ● Outcome 2: V-LEEP developed a pilot program, called “The Direct Power Purchase Agreement,” which will allow business enterprises to meet their global sustainability commitment by directly contracting with renewable energy project developers. ● Outcome 2: V-LEEP provided modeling and technical assistance to support the drafting of Vietnam’s eighth National Power Development Plan (PDP8). ● CCI: The Vietnam Urban Energy Security Activity supported Da Nang and Ho Chi Minh City to harmonize national strategies, policies, and regulations, and encourage clean energy solutions nationwide. ● PSE: V-LEEP engaged private sector partners to facilitate the deployment of bankable rooftop solar and other renewable energy solutions for its pilot scheme. ● GESI: V-LEEP developed a tool that is tailored to the Vietnam context, assists RE developers on gender mainstreaming, and complements existing efforts in the gender and RE ecosystem.

CHALLENGES

Across the Indo-Pacific region, governments see energy efficiency and expansion as a critical driver for economic growth and stability. There are limited options to transform energy systems quickly, especially when most countries already do not produce or deliver enough energy: either increased supply (including renewables) or more efficiently distribute and use existing energy supply (including through regional energy trade) are the most feasible options. In both cases, USAID interventions work to (1) address the technology gaps to ensure power system stability and reliability as higher shares of renewable energy are integrated into the system and (2) facilitate smart energy policies, procurement, and trade. Asia EDGE Missions provided important, country-specific challenges around which USAID interventions must work. These descriptions are summarized alphabetically by country name below.¹⁸

Over the last decade, Bangladesh experienced unprecedented economic, industrial, and urban growth that has led to increased energy demand and consumption. However, like most of its neighbors in South Asia, Bangladesh lacks reliable, accessible, and clean power. Regional connectivity suffers from financially weak energy utilities and experiences negative impacts from air and water pollution. Any one of these has the potential to constrain economic development, which will undermine the achievement of the country’s development goals.

Bangladesh aspires to achieve high-income country status by 2041. To do this, the country needs to expand its energy infrastructure. To attain the target of 100 percent reliable energy coverage by the end of this year (2021), the Government of Bangladesh (GOB) acknowledges the importance of diversifying its fuel mix with low-cost options. Bangladesh’s mainstay energy resource – natural gas – is also being

¹⁸ USAID/Vietnam did not provide additional details in this area but USAID/RDMA’s analysis of the regional contextual challenges fills this gap somewhat.

quickly exploited and is expected to only last until 2026. The GOB recognizes the crucial role of RE and energy efficiency in meeting the country's future energy demands. The GOB's 2016 Power Sector Master Plan sets an ambitious target of 10 percent of energy production from RE resources by 2021 and a target of generating 3,864 Megawatts (MW) of renewables by 2041.¹⁹ To date, the achievement is well short, with only 320 MW of renewables coming on the grid. If RE is not harnessed, the future demand for the country's electricity will have to be met by expensive fossil fuel and imported electricity. Bangladesh has significant potential for renewable energy, specifically solar and wind for power generation. The GOB hopes to stimulate private sector investment and rural economic development, and meet growing energy demand by harnessing these domestically available energy resources. USAID/Bangladesh has, therefore, been supporting the GOB in various capacities related to the country's clean energy sector.

India is a leading global power and key U.S. ally in the Indo-Pacific region. Despite India's increased capacity to solve its development challenges, the world's largest democracy faces the daunting task of providing quality services to its growing population, especially in light of 2020's challenges. Since March 2020, the rates of COVID-19 transmission in India have steadily increased, while at the same time government-enforced quarantines and the lockdown of India's borders in order to limit the spread of the virus, have led to secondary hardships (such as prohibitions on movement, economic slowdowns, increased gender-based violence, and the loss of livelihoods across the region). The COVID-19 lockdown has decreased revenues for generators and distribution utilities (DISCOMs), exacerbating the financial difficulties that DISCOMs had experienced even before the pandemic. Due to its central location, advanced economy, and robust energy system, India is essential to advancing the U.S. Government's Indo-Pacific vision for regional energy connectivity and energy-sector growth. And yet, hampering the GOI is at times a weak enabling environment, limited financing, insufficient workforce skills, financially poor public utilities, and low human capacity.

The Philippine energy sector is expected to grow at five percent annually, requiring \$70 billion in new energy investments by 2040. When looking at future energy demand, however, concerns exist regarding major production sources, such as the Malampaya gas field. Malampaya is the country's largest indigenous energy source, which will begin to decrease production starting in 2024 and is already decreasing output. Natural gas-powered plants fueled by Malampaya currently supply a full quarter of the energy needs of Luzon, inclusive of Metro Manila.

The Philippines has achieved significant milestones through successful power sector reforms that enabled private-sector investment in energy generation, transmission, and distribution. Meeting the challenges associated with future energy demands is contingent on the capacity and commitment of the Government of the Philippines to respond to its own mandates, foster innovation, and further increase private sector investment.

Nepal's annual per capita electricity consumption, although growing, is one of the lowest in the world. Its hydropower generation capacity increased from 1,182 megawatts (MW) last year to 1,278 MW this year, according to the 2020 Nepal Electricity Authority Annual Report, but the country remains well short of its commercially viable potential of approximately 40,000 MW. Nepal currently imports a third of its electricity from India to meet growing domestic demand, and about 20 percent of its population remains entirely off-grid. This low level of electrification hampers economic development, access to information, health, and education—particularly in rural areas—and is detrimental to Nepal's stability and independence from external malign influences.

¹⁹ The Master Plan stipulates 2,470 MW by 2021 and 3,864 MW by 2041. See more here: [People's Republic of Bangladesh Power & Energy Sector Master Plan \(PSMP2016\) Final Report Summary](#).

In 2015, when USAID launched the Nepal Hydropower Development Project (NHDP), Nepal was facing a severe energy deficit with up to 18 hours per day of blackouts, even in the capital city of Kathmandu. Over its five years of implementation, NHDP provided critical support to the Government of Nepal, private sector, and key energy stakeholders in Nepal, to make significant regulatory improvements which helped Nepal improve its electricity supply through better grid management. System losses were reduced from 25 percent to 15 percent. NHDP also provided extensive support for Nepal's efforts to expand access to modern, high-quality electricity services and to realize its potential as an energy exporter in South Asia.

Regionally, USAID/RDMA reports that energy demand in Southeast Asia is expected to double by 2040, while the region's governments aim to secure at least 23 percent of primary energy from renewable sources. To support economic growth—following the COVID-19 pandemic—the region must upgrade and expand its energy systems, modernize infrastructure, and build regional markets for the exchange of energy commodities. The Asian Development Bank estimates that Asia requires investments of \$14.7 trillion in power infrastructure between 2016-2030 to maintain its economic growth momentum. With the region's annual investments falling short of this level, government reforms and private sector investment are crucial to helping Asia overcome this key constraint to growth and stability.

In a report examining the impacts of COVID-19 on Southeast Asia's power sector, NREL found that overall demand for energy decreased due to restrictions associated with managing the pandemic. The study found, however, that the greatest demand for energy shifted from the commercial and industrial sectors to the residential sector during the pandemic, resulting in already financially-constrained consumers paying more in energy costs as they were confined to their homes. Inflexible power purchase contracts resulted in overpayment for excess power capacity, and new projects have been delayed due to supply chain and other disruptions. Existing renewable energy projects have continued to operate, however, contributing to overall improvements in air quality resulting from decreased fossil fuel combustion.

CONCLUSION

FY 2020 results expanded on FY 2019 results, and further illustrated the United States Government's (USG) commitment to transforming the energy sector in the Indo-Pacific region. For many of the country contexts of the Indo-Pacific where USAID works, energy infrastructure is the predominant driver for economic growth and overall stability, in both new and emerging sectors. Logically, the economic development of countries with healthier, better-informed, and better-educated citizenry also relies on expanding, reliable energy supply. To fill growing energy demand, countries will have to turn to increasing efficiency of energy use or transmission, enhance the use of renewable energy sources, and improve the mechanisms that allow energy trade across borders.

Construction of new generating capacity, whether conventional or renewable, will require considerable investment, from both public and private sources. Both require legal and policy changes as private capital will only flow to where it can safely get returns on its investment, while employment of public capital resources can only be justified when used efficiently and equitably by public officials.

In the face of these challenges, regional integration (as part of Asia EDGE Outcome 4) will become more important as a counterbalance to PRC's planned Mekong regional power grid. While the COVID-19 global pandemic may have changed the nature of USAID engagement, FY 2020 results still proved impressive in terms of performance data. Other COVID-19-related changes included the shift in the end-use mix of energy (i.e. more residential vs. industrial energy use). Therefore, it continues to be

highly effective for the USG to continue work in the Indo-Pacific energy sector and for USAID to continue to engage with legislators and policy makers and to provide technical assistance to utilities.

ANNEX I. PROGRAMMING HIGHLIGHTS BY GOAL OR OUTCOME

Several important caveats should be noted in interpreting this report's results and the information in Table 2: (1) not all OUs had activities that fit under each Goal or Outcome nor will future activities fall under each Goal or Outcome; (2) most, but not all OUs reported results by Goal or Outcome, and in some cases results were interpreted for best fit; (3) not all reported data were relevant enough to aggregate at a high level (e.g., outputs like number of people trained); and (4) a few of the results shared under Asia EDGE were reported under other IPS Initiatives or Program Focus Areas (as of February 2021 exact references are being determined). Cross-reporting with other IPS Initiatives and Program Focus Areas is footnoted where relevant and will be finalized with Asia Bureau input.

Table 2 below indicates which OUs reported results according to the Asia EDGE Goal or an Outcome. More details are provided below.

TABLE 2. FY 2020 RESULTS REPORTED BY OU ACCORDING TO GOAL/OUTCOME

OU	Goal	O1	O2	O3	O4	CC ²⁰	PSE	GESI	CSE
Bangladesh	✓	--	✓	✓	✓	✓	✓	✓	✓
India	--	✓	✓	✓	✓	--	✓	✓	--
Indonesia	--	✓	✓	✓	--	✓	✓	✓	✓
Nepal	--	✓	✓	✓	✓	✓	✓	✓	✓
RDMA	✓	✓	✓	✓	✓	--	✓	✓	✓
South Asia Regional	--	✓	--	--	✓	--	--	✓	✓
Vietnam	--	--	✓	--	--	✓	✓	✓	✓

Annex I is organized according to the Results Framework, following the relevant Goal, Outcomes and Asia EDGE and IPS Cross-Cutting Outcomes. OU-reported results were analyzed for best fit and organized according to the Goal (higher-level) or relevant Outcome (lower-level). Within each Goal or Outcome, results are organized alphabetically first by regional OUs and then bilateral OUs. Countries where activities take place include those in which regional OUs conduct work but are not bilateral Missions (e.g., Thailand). USAID/India activities contributed to both South Asia Regional and India-specific results and are presented as such.

Asia EDGE Goal: Energy Sector Transformed to Accelerate Energy Security and Sustainability in the Indo-Pacific Region

RDMA: At the end of FY 2020, USAID/RDMA launched the Enhancing Equality in Energy for Southeast Asia (EEE for SEA), a \$9 million, three-year new Activity that seeks to enhance development and economic outcomes by improving gender equality in the Southeast Asia (Cambodia, Indonesia, the Philippines, Vietnam, and Thailand²¹) energy sector.

²⁰ This is an Asia EDGE-specific CC outcome: Established Regulatory Systems Including Implementation of Environmental Safeguards.

²¹ Burma and Laos are prospective countries for future implementation.

Bangladesh: USAID/Bangladesh’s Wind Power Capacity Building (WPCB) Activity and the Scaling Up Renewable Energy (SURE) Activity arranged virtual workshops in August 2020 to build civil society and private sector capacity in wind power development. The four-module series focused on wind energy project development and renewable energy procurement. The wind energy project development modules provided a primer on the wind project development process including a market and technology overview, reviewed the importance of data-driven decision making, and offered a tutorial on the Renewable Energy Data Explorer. The renewable energy procurement modules provided a comprehensive overview of the renewable energy procurement process with a deep dive into wind energy procurement. The RE Data Explorer will support vital renewable energy investment and deployment decisions. Additionally, to assist domestic wind power industry development and to understand key challenges and issues faced by both public and private stakeholders while entering the wind energy market, USAID’s WPCB program conducted several consultations and developed a One-Stop-Service document that synthesizes information and necessary resources for wind project development, with points of contact and web links for further reference.

Asia EDGE Outcome I: Performance of Energy Utilities Improved

Energy utilities play an important role in determining the security, reliability and affordability of energy in the region, and are the direct link between energy provision and the consumer. Outcome I is designed to modernize utility technologies and planning, to improve operations and to increase cost recovery.

RDMA: USAID Clean Power Asia and the U.S. National Renewable Energy Laboratory (NREL) provided feedback at the Association of Southeast Asian Nations (ASEAN) Interconnection Masterplan Study (AIMS) III Technical Review Group meetings to improve modeling and planning processes and to capture regional renewable energy deployment potential, which will help improve energy security, accessibility, affordability, and sustainability in the ASEAN member states as well as support broader development goals across the Indo-Pacific region.

South Asia Regional: As part of the World Utility Summit 2020, USAID convened a workshop to discuss challenges facing South Asian distribution utilities including insolvency, smart meters deployment, digitalization and adaptation to a more decentralized power system. This workshop led to a draft blueprint for a regional cooperation platform to support utility modernization. This platform will be used as a knowledge network to facilitate cross learnings between countries in the region and to accelerate best practice adoption. The consensus to create a distribution utility network platform is a key achievement for the utility modernization pillar of USAID’s Asia EDGE approach.

India: USAID supported the Gujarat state power generation utility, Gujarat State Electricity Corporation Ltd. (GSECL) in a successful low-load test run of its 500 MW Ukai unit at only 40 percent capacity. These test results will enable GSECL to optimize operating costs, customize their load under future flexible operating conditions and set a foundation for adopting the nationwide roadmap for flexible operations of coal-power plants. The flexible operation of coal powered plants supports generating utilities ability to adapt to the RE energy transition, which is a key parameter under the modern utilities pillar of the Asia EDGE initiative.

The above results from Gujarat are relevant to the ambitious RE targets that India has set to meet rising energy demand and decarbonization goals. Also, USAID supported resource planning tool development and implementation and therefore supported reliable and inexpensive power delivery to consumers. First, USAID developed a Demand forecasting software, a state-of-the-art tool to help Distribution Companies (DISCOMs) forecast medium- and long-term electricity demand. The tool – piloted in Assam and Jharkhand – allows utilities to better plan for higher renewable integration, reduce grid integration

costs and optimize power purchases. Secondly, USAID helped develop and train energy professionals on the state-of-the-art distribution utilities' Renewable Energy Procurement Optimization and Smart Estimation (REPOSE) tool, which helps improve precision of medium- and long-term demand forecasting and facilitates resource planning and procurement-portfolio optimization. Training for utility planners and sophisticated resource-planning tools will allow utilities to ensure cost-effective renewable energy procurement.

In FY 2020, USAID provided guidance to the GOI as it planned to privatize DISCOMs of all eight Union Territories of India. USAID worked with the Ministry of Power (MOP) to develop innovative private participation models, related guidelines, standard bidding documents and contracts to facilitate effective model rollout.

Indonesia: As the national electricity utility, PLN plays a critical role in the sector. USAID continues to improve PLN capacity to plan, procure and integrate renewable energy into Indonesia's power grid. Through the Indonesia Clean Energy Development (ICED) II Activity, USAID provided technical assistance and capacity building to PLN, the Ministry of Energy and Mineral Resources (MEMR), the Ministry of National Development Planning (Bappenas), the Financial Services Authority (OJK), local governments, financial institutions and the private sector to create an effective policy, regulatory and incentive environments for increasing advanced energy deployment, private sector investment and improving electric utility performance. Over the five years of ICED II implementation, USAID mobilized \$1.62 billion in investments for 32 renewable energy and energy efficiency projects to provide 5.3 million people with access to clean electricity. USAID also supported completion of 42 renewable energy projects with a total capacity of 438.7 MW, which are currently providing electricity to 3,323,550 people and contributing to 6,925,812.4 tons of CO₂-equivalent of greenhouse gas (GHG) reductions.

To support the Government of Indonesia's priorities for substantial infrastructure investment, including energy, as a means to achieve its economic growth goal to reduce poverty and lift the country towards self-reliance, USAID completed the Distribution System Planning Guideline in 2019, which the PLN President Director adopted by decree in May 2020. With the issuance of the Guideline, the World Bank released \$25 million under a loan program to increase access to electricity services and to improve the efficiency and reliability of these services throughout Indonesia. In parallel, USAID developed a draft revision of the existing nationwide MEMR and PLN distribution code that incorporates most updated information technology, technical and component standards and planning and operating procedures. These revisions will allow easier connection of distributed energy resources and technologies, such as solar rooftops and electric vehicles to the distribution grid system.

In addition, USAID developed feasibility study guidelines for PLN which include methodologies for financial and economic analysis for connecting variable renewable energy generating plants from independent power producers to PLN's power grid. To ensure the feasibility study guideline adoption, USAID held one in-person and five virtual training of trainers with the PLN Corporate University for 225 participants from various PLN units to apply the guidelines in real projects. USAID's assistance will ensure that PLN staff from regional offices will apply the same standards when reviewing project proposals from independent power producers, thus increasing transparency and quality in project development, procurement, and investment.

Finally, USAID supported PLN and MEMR to improve grid flexibility and reliability for interconnecting variable renewable energy such as wind and solar to PLN's island-grid systems. PLN still runs most smaller island grids on decades-old high-cost diesel generators. In FY 2020, PNL successfully operated the USAID-installed automatic dispatch system (ADS) in the PLN East Sumba power grid, using technology from US firm ComAp Limited Liability Company, to improve isolated grid performance and enable the increase of renewable energy penetration thus stabilizing power quality by reducing blackout

frequency and maintaining power quality according to Indonesia's power distribution codes, while maximizing input from a 1 MW solar photovoltaic (PV) power plant. Using this pilot as a model, PLN is exploring the potential of ADS installation in other island-grid systems, particularly in eastern Indonesia.

To improve energy ministry, provincial governments, and other relevant institutions' use of data for energy access and infrastructure planning to improve coordination and planning in the energy sector, USAID developed two interactive geospatial platforms for national-provincial energy planning. The MELISA platform will be used to report, monitor and evaluate electricity access expansion programs to households, and the SPEND platform will be used to monitor and evaluate provincial energy planning and programs across all 34 provinces. Both platforms will be formally launched next year.

Nepal: USAID, through the Nepal Hydropower Development Program (NHDP), worked with the Department of State and the Millennium Challenge Corporation to mobilize support to the Nepal Electricity Regulatory Commission (ERC). NHDP provided the ERC tailored training on best practices for modern energy regulation and financial analysis, and technical assistance on drafting regulation bylaws and directives. Through technical assistance from NHDP, ERC developed a communications strategy; conducted the first tariff hearing; finalized bylaws on the Purchase and Sale of Electricity and Conditions to be Fulfilled by Licensees; drafted and issued several ERC directives on Consumer Tariff, Mergers and Acquisitions, Public Hearing Procedures, and By-Laws on Conduct of Business and Dispute Resolution. NHDP also developed a Discussion Paper on Generation Tariffs, and Reports on Customer Service Standards, Technical Standards of Performance, and Impact of COVID-19 on Nepal's Electricity Sector. This assistance established critical functions of the ERC to enable transparent and efficient systems to improve Nepal's energy sector performance.

Asia EDGE Outcome 2: Deployment of Advanced Energy Systems Increased

Outcome 2 is designed to encourage a more secure energy future in the Indo-Pacific region and to support the investment in and deployment of environmentally and socially sustainable systems for power generation, transmission, distribution, and consumption. Advanced energy systems necessitate USAID support to address key technical, policy, regulatory and institutional capacity constraints.

RDMA: USAID supported multiple Southeast Asia-focused training events and conferences covering clean energy technologies, policy frameworks and finance and investment. The USAID CPA Activity launched a renewable energy learning series that opened dialogue to help USAID's regional partners make clear, well informed choices regarding energy sector investments and to unleash Southeast Asia's abundant renewable energy resources. In March 2020, the first webinar on distributed solar policies engaged nearly 90 participants, and in April 2020, 300 participants discussed industry best practices in financing large-scale solar, wind and biomass plants. The USAID CPA Activity energy experts also participated in multiple online international conferences as thought leaders.

The USAID Southeast Asia EDGE Hub hosted the Asia EDGE Power Sector Learning series webinars, available on the USAID Southeast Asia Edge YouTube channel. Presenters included experts from the U.S. National Renewable Energy Laboratory (NREL), the USAID CPA Activity, the USAID Vietnam Low Emission Energy Program, and the Clean Energy Investment Accelerator, among others.

USAID/RDMA, through its CPA Partners, offered a free online course on enhanced electricity demand modeling and forecasting approaches to accurately assess changing electricity needs. Over 30 participants from governments, utilities and system operators across seven different countries in Asia attended. This course enabled regional system operators to make well-informed choices regarding long-

term electricity demand planning and to enhance their capacity to deploy advanced energy systems. Course materials were also made available online to reach a broader audience.

Additionally, the CPA Activity helped structure renewable energy investments worth nearly \$590 million across the region²² and provided continued support to the Big C supermarket chain in financing and building of solar rooftop projects in Thailand, adding an estimated \$8.13 million and 8.75 MW of solar rooftop capacity for nine Big C stores, and contributing to the country's national solar rooftop target of 15,574 MW by 2037. The CPA Activity also supported the launch of a comprehensive solar rooftop policy and incentive program to deploy 549 MW of new solar rooftop systems and mobilize private clean energy investments valued at more than \$465 million as well as a 48 MW wind project mobilizing \$115 million for new wind generation in Vietnam.

Support also included the launch of the no-cost "Ask an Expert" service helpline²³ to support Southeast Asian countries navigate the energy sector impacts related to COVID-19, as well as the launch of the Southeast Asia Renewable Energy Data Explorer through the development of time-series solar data²⁴. USAID/RDMA also supported national governments, such as through NREL's work with the Lao Government and Ministry of Energy and Mines in developing electric vehicle supply equipment business models and associated tariff designs to help Laos build a financially sustainable electric vehicle charging infrastructure network and to increase private sector investment. Additional support included expansion of U.S. best practices throughout the region and strengthening energy security by mobilizing renewable energy financing in Vietnam.²⁵

Bangladesh: With the intent to provide support in achieving Bangladesh's renewable energy and energy capacity goals, USAID's Scaling Up Renewable Energy Activity (SURE) published "[Challenges in the Development of Variable Renewable Energy in Bangladesh](#)," and later published "[System-Friendly Competitive Renewable Energy Procurement in Bangladesh](#)." Researchers, think tanks, agencies and other energy sector stakeholders identified the most critical challenges hindering grid-connected variable renewable energy development and provided actionable recommendations that, if implemented, will allow the GOB to make meaningful gains in new generation capacity through renewable energy and help to improve energy security, reduce import dependency, and contribute to mitigating global climate change. Additionally, USAID supported the nascent wind industry's development in Bangladesh. In FY 2020, support included capacity building workshops for GOB agencies on wind energy procurement and data and tools to inform decision making, private sector roundtable discussions to understand key challenges and barriers to entry in the wind energy market, development of a One-Stop Service document that encapsulates much of the information and resources necessary for wind project development, and webinars for local stakeholders that allowed participants to identify the challenges and opportunities associated with wind energy project development, financing and procurement processes²⁶. As a result of these workshops, participants are able to identify unique, context-specific challenges and opportunities associated with renewable energy procurement, understand procurement best practices

²² Bringing the total investments to \$927 million to date over the life of the project.

²³ USAID/RDMA and the NREL launched a no-cost [Ask an Expert service](#), that connects government stakeholders, utilities, power system operators and policymakers to NREL experts, providing these stakeholders with guidance and real time solutions

²⁴ The Southeast Asia Renewable Energy Data Explorer will increase the energy sector's PSE and improve policies, ultimately advancing energy systems in Southeast Asia.

²⁵ CPA assisted Thai company Sermsang Power Corporation to identify a suitable financing structure for a 48-MW wind power project in Vietnam. Engaging with multiple banks and private equity funds allowed the company to execute the project's engineering, procurement and construction contracts.

²⁶ USAID's Scaling Up Renewable Energy Activity, in coordination with the U.S. Department of Energy's NREL, held two webinars (Wind Technology Overview and Wind Development Overview) where 60 participants learned about wind technology and the wind market, including on the importance of data-driven decision-making and how to use RE Data Explorer, a geospatial tool that supports RE investment and deployment decisions.

and their application, and to determine how policy and regulatory environments can support renewable energy deployment in Bangladesh.

India: In FY 2020, USAID/India promoted renewable energy and other advanced technologies. The clean energy program is promoting energy efficiency technologies and faster and more cost-effective RE rollouts. By testing a variety of innovative technologies, undertaking analysis and simulation studies, supporting policies and regulatory frameworks, and enhancing system operators' and regulators' capacity, USAID is enabling large-scale RE integration into the power grid.

In FY 2020, USAID/India provided regulatory technical assistance to local stakeholders, supported the energy infrastructure development, piloted several new ideas, supported increased flexibility of the country's grid and made preparations for the post COVID-19 era. These included:

- USAID provided technical assistance to the Bihar Electricity Regulatory Commission (BERC) to formalize regulations on an intra-state availability-based tariff (ABT) and deviation settlement mechanism (DSM). The DSM will incentivize deployment of advanced energy systems and integration of renewable energy by penalizing generators and distribution companies for inaccurate generation and load forecasts, as better forecasting allows greater control of renewable variability and system reliability.
- USAID supported the development of several large-scale infrastructure projects. In designing and implementing of a first-of-its-kind large-scale PCS project for electric vehicles, USAID assisted in developing a viable business model,²⁷ then identified and prioritized sites for PCS installation and worked with the charger vendor to ensure timely implementation of the charging stations. As of April 2020, nearly 85 PCS had been installed in several cities, with plans to install over 1,500 public chargers in over 13 cities by March 2021. USAID's methodology, model and capacity building methods are documented in the "Practitioner's Guide for Deployment of Public Charging Stations" which was launched jointly by senior government officials at the Regional workshop on Power Distribution.²⁸
- USAID/India also provided technical assistance to the MOP in planning the National Roll Out of Smart Prepaid Meters.²⁹ USAID developed Standard Bidding Documents (SBD) for third party finance and the installation and management of smart meters without upfront investment by the distribution utilities. SBDs will shorten and streamline the public procurement process and open a market worth \$20 billion to international bidders.³⁰

USAID/India also implemented four initiatives to support distributed solar power. First, USAID conducted a market assessment to identify key quality and safety issues. With the Confederation of Indian Industries, USAID developed and implemented a strategy to rate Indian Rooftop Solar Vendors. Second, USAID suggested regulations to increase the rollout of behind-the-meter energy-storage systems combined with distributed photovoltaic. Third, it conducted a Value of Solar assessment for the states of Gujarat and Jharkhand. Finally, it developed a business model for promoting solar power distribution to low-income consumers which will further solar power distribution system deployment,

²⁷ Including a pricing mechanism favorable to landowners, power distribution utilities, charger operators and consumers alike.

²⁸ Power Secretaries of Sri Lanka and Maldives; Additional Secretary, Government of India; EESL, Managing Director; Joint Secretary, Government of Nepal; and USAID Mission Director.

²⁹ The largest smart meter program in the world, that will help in grid digitalization by improving energy billing, energy accounting, payment recovery and integration with grid management systems.

³⁰ As reported in a Success Story from Q3 FY 2020, this result is ongoing. It is unknown as of the writing of this report whether this framework was accepted and launched. More information found [here](#).

improve the availability of power and reduce DISCOM losses. A project in Jharkhand was developed to pilot this model.

To increase energy sector flexibility, to modernize India's grid and to allow for an increase in RE targets, USAID worked with local stakeholders to adapt infrastructure. In partnership with India's largest national power producer, NTPC, and Gujarat State, USAID conducted feasibility studies and test runs at low load and built the capacity of local engineers and plant operators to develop NTPC's fleet-wide strategy and the business case for policy and regulatory changes to enable flexible operations. In FY 2020, USAID and the GOI's MOP concluded a two-year pilot and operationalized India's first use of AGC³¹ at the Sharavathi Hydropower Plant in Karnataka. The pilot showcases AGC in two types of energy generation (hydro and solar) to support India's roadmap for AGC adoption throughout the country to balance the supply and demand for energy in real-time.

USAID also piloted (or concluded the pilot of) several innovative ideas. Among them:

- To improve quality and safety of the rooftop solar systems (RTS) currently installed in India, where there are plans to multiply current coverage tenfold by 2022, USAID worked with the National Renewable Energy Lab to design a vendor rating system for RTS. USAID presented this new system to the National Institute of Solar Energy and other senior officials of the Ministry of New and Renewable Energy (MNRE).³²
- USAID and the Power Grid Corporation of India Limited finalized a two-year pilot test of a BESS which, by balancing renewable energy fluctuations in transmission grids, could solve reliability problems for Indian grid operators. The pilot demonstrated suitability of two BESS technologies in performing various functions and established BESS' economic viability.³³
- In FY 2020, USAID completed its pilot to support flexible operations of coal-based generators with India's largest national power producer and Gujarat State generator. This effort resulted in 1,410 MW of flexible coal capacity, informed the GOI's roadmap on flexible operation of coal power plants and developed protocols for conducting low-load operations. USAID also supported the adoption of 12 policies and regulations to enable grid integration. With these efforts, USAID reduced 30 million tons of GHG emissions and supported integration of 5,090 MW of renewable energy.
- USAID launched the South Asia Group for Energy (SAGE) consortium, comprising USAID and the U.S. Department of Energy National Laboratories. SAGE will work with South Asian institutions to research and analyze energy sector opportunities and facilitate access to expertise within the labs. In 2020, the partnership with Indian institutions was launched to enhance forecasting capabilities for wind and solar resources, modeling, and capabilities in cookstove testing, and research on biomass and RE hybrid systems.

USAID also supported measures to ensure safety post-COVID-19. In Q3 of FY 2020, USAID launched the "Healthy and Energy Efficient Buildings" initiative to make workplaces safer and more efficient.³⁴ As a part of this pilot initiative, Energy Efficiency Services Limited (EESL), India's largest public energy service company, and MOP's implementation arm took the lead in implementing this framework in its own offices. The EESL office pilot will provide important lessons for developing specifications for Heating,

³¹ AGC is an advanced tool for grid operators to adjust generators' power output in response to changes in load and variability in the system.

³² This result was reported in a Success Story from Q3 FY 2020.

³³ BESS is an important tool for the South Asian energy transition and this pilot will help strengthen energy security in South Asia.

³⁴ See more about the 'RAISE' initiative here: [RAISE FOR BETTER AIR QUALITY, SAFETY & EFFICIENCY](#)

Ventilation and Air Conditioning (HVAC) systems for use in other buildings throughout the country.³⁵ The system will also evaluate effectiveness and cost benefits of various technologies and their short and long-term impacts on air quality, comfort, and energy use. The initial results show nearly 98 percent improvement in indoor AQI compared to the outdoors. The initiative was formally launched in July by the Honorable Minister for Power, Mr. R. K. Singh.

Also, as part of USAID support in the area of air quality, the USAID-supported Environment Health and Safety + (EHS+) Center developed a toolkit applicable across industry sectors (e.g., textiles, automotive) to support response, readiness and faster recovery post COVID-19.³⁶

Indonesia: USAID supported Indonesia in expanding access to energy in rural areas with renewable resources, a solution to reducing the use of fossil fuels in many of the country's small islands. Using U.S. technology, USAID deployed an automatic dispatch control in Sumba Island to improve operation of a diesel generator and solar PV hybrid system. The project successfully improved grid power quality for more than 32,000 households and small industry consumers, encouraging further replication in PLN's other island grids particularly in eastern Indonesia.

As mentioned in Outcome I, the ICED II Project, which concluded in 2020, supported improvement in coordination and alignment between various government entities and developed two geospatial-based platforms, MELISA and SPEND, for the MEMR and the NEC respectively. The Project also provided technical assistance to developers and financial institutions implementing small- and medium-scale renewable energy. For instance, following a presidential regulation to accelerate development of battery electric vehicles, ICED II assessed alternative business schemes for electric vehicle charging for MEMR, covering global practices, lessons learned and recommendations for developing battery charging infrastructure in Indonesia. MEMR subsequently released a regulation on Provision of Charging Infrastructure for Battery-Based Electric Vehicles in August 2020, adopting some of USAID's input. Over the five years of ICED II implementation, USAID has helped 42 renewable energy projects with a total capacity of 438.7 MW reach completion and commercial operation. These projects are currently generating sustainable energy services for more than 3 million people and reducing almost 7 million tons of carbon emissions. In FY 2020 alone, ICED II contributed to the operation of 140 MW capacity generation.

USAID strengthened the policy and regulatory environment for Indonesia's renewable energy market to attract investment and help new projects get off the ground, therefore supporting the country's ambitious goal of having 23 percent of its energy from renewable sources by 2025. USAID provided training programs, demand-driven technical assistance, independent technical review and transaction advisory to project developers, banks, and PLN to evaluate 18 renewable energy projects at various stages of development. Two of these projects, with a combined total capacity of 11.5 MW reached financial closure with a total investment of \$19.8 million.³⁷

To improve coordination in energy planning, USAID developed two new geospatial based digital platforms that synchronize national and subnational energy and electricity planning for MEMR and the National Energy Council (NEC). These platforms will support data exchange, communication and

³⁵ The pilot has three phases: (1) installation of air monitoring systems (deployed and a dashboard is collecting the data); (2) installation of air filtration systems which can trap pathogens including those from indoor air (since deployed and led to 90 percent reduction in particular matter 2.5); and (3) retrofitting existing cooling systems with energy efficient ones.

³⁶ The kit contains a self-assessment questionnaire, an industry readiness protocol and web-based dashboard, a supervisor checklist and a knowledge platform. Since the launch, this toolkit has been used by more than 500 industries to check their preparedness for resuming operations in a safe manner.

³⁷ Over five years of ICED II implementation, USAID has mobilized \$1.62 billion investment for 32 renewable energy and energy efficiency projects that expect to provide 5.3 million people with access to clean electricity.

coordination between provincial governments and PLN regional offices with the national government using interactive geospatial maps and other features. USAID further facilitated dissemination workshops with provincial governments, national and sub-national energy planners, PLN and other relevant users. By the end of FY 2020, both platforms were transferred to MEMR's own systems for future use, which marks a USAID legacy institutionalized in GOI institutions. USAID also supported the national government to coordinate and align monitoring, evaluation and reporting platforms for the Low Carbon Development Initiative with provincial governments. USAID continued to assist Aceh, South Sulawesi and North Sumatra provincial governments to transition from their local GHG emission reduction action plans to align with Indonesia's [Low Carbon Development Initiative](#).

Nepal: The Nepal Hydropower Development Program (NHDP) supported the Government of Nepal (GON) in leveraging \$1.8 billion in public and private investments to develop 1,116 MW to meet domestic and regional demand. In FY 2020 alone, USAID/Nepal mobilized \$700 million in investment, representing 216 MW of energy capacity. NHDP's support helped the GON include robust environmental, disaster management and GESI provisions in the Project Development Agreements.

USAID and other development partners assisted MOEWRI in the preparation of a draft bill on Energy Efficiency, providing guidance and case studies on the structure and function of energy efficiency legislation. Complementing this work, NHDP delivered a report to the ERC on its role as an energy efficiency policy and legislation regulator. It also collaborated with USAID's Paani Project to help draft the Water Resources Policy. These policies help improve the foundation that Nepal's energy sector is built on, promoting efficiency and reducing environmental impact.

Vietnam: The USAID Vietnam Low Emission Energy Program (V-LEEP) supported RE and Vietnam's power system resiliency, including intensive modeling technical assistance for the Government of Vietnam's (GVN) Ministry of Industry and Trade (MOIT)³⁸, support to the development of Vietnam's eighth National Power Development Plan (PDP8) and capacity building. By the end of FY 2020, the Mobile World Investment Corporation (MWG) submitted the final draft for the PDP8 to MOIT which, after review, will be submitted to the Prime Minister for approval.

In FY 2020, V-LEEP continued to work with the Electricity Regulatory Authority of Vietnam (ERAV) to develop a pilot program of the Direct Power Purchase Agreement (DPPA), a mechanism that allows business enterprises to meet their global sustainability commitments by directly contracting with RE project developers. V-LEEP also worked with ERAV to consolidate inputs and draft the decision and supporting documentations for the pilot program. As a result, MOIT submitted its draft Decision for Prime Minister and is expected to be approved by the end of 2020 or early 2021. This will allow 400-1,000 MW of wind and solar to be financed and built by private investments. This decision will create an attractive business environment for FDI and will attract the needed finance for these projects through more bankable and secure energy contracts.

In FY 2020, V-LEEP supported MOIT to implement the national rooftop solar promotion program which was launched in June. V-LEEP developed a solar rooftop promotion portal to provide information, regulations and guidance for households, commercial customers, and industrial investors to learn about the benefits and procedures of installing solar rooftop systems. By the end of FY 2020, over a year after launching the promotion program, the total installed capacity of solar rooftops in Vietnam is over 1,500 MW-peak, five times higher than the figure in June 2020 when it was launched.

³⁸ By supporting the MOIT MWG, V-LEEP helped examine different scenarios to consider increasing levels of variable clean energy in power dispatch and transmission planning. Support also included procurement of a server and licensed power modelling software PLEXOS® that are used as key tools for developing the PDP8.

Asia EDGE Outcome 3: Transparent, Best-value Procurement Adopted

Transparent, best-value procurement helps energy markets become more efficient and allows investors to gain equal access to investment opportunities. A rule-based framework allows capital and resources, including private investment, to flow to where they are most effective, and promotes the most optimized use and adoption of technologies.

RDMA: USAID supported work towards Lao PDR's first open, transparent 40 MW solar power auction. USAID worked with the government to drive the completion of agreements and technical standards vital for approving the auction's launch. Auctions will reveal competitive prices, attract high-quality projects, and equip Laos with the transparency to make well-informed choices in clean energy, strengthen Laos' power sector and expand opportunities for U.S. investors.

Bangladesh: Although renewable energy procurement is very context specific, there are some common best practices for countries with nascent renewable energy industries. In Bangladesh, USAID organized the sharing of lessons learned from the U.S. on several occasions. First, under USAID's Bangladesh Energy Regulatory Partnership Program, the U.S. National Association of Regulators and Utility Commissioners (NARUC) organized a workshop on dispute resolution with the Bangladesh Energy Regulatory Commission (BERC). BERC is in the process of drafting new rules for the informal process, which, once adopted, should lead to improved dispute resolution and regulatory functions, enabling utility modernization through improved distribution and customer service. Second, USAID's Scaling Up Renewable Energy Activity, in coordination with the U.S. Department of Energy's National Renewable Energy Laboratory, held two webinars,³⁹ included in-depth discussions on feed-in tariffs and negotiated competitive procurements. As a result of these capacity-building webinars, participants can now identify unique, context-specific challenges and opportunities associated with RE procurement, understand procurement best practices and how to apply them, and determine how policy and regulatory environments can support RE deployment in Bangladesh.

India: USAID supported improved energy procurement processes in India through collaboration and analytical support. India has an ambitious target to add 175 GW of RE by 2022. After the successful bid of a 1.2 GW time-block tender worth \$1 billion in January 2020, the SECI launched another bid of 5 GW of round-the-clock power worth \$4 billion in March 2020. This marked a big step toward system-friendly RE procurements in India that lowers generation and integration costs. The SECI tenders incorporated several lessons and global best practices on system-friendly competitive bidding, provided by USAID.⁴⁰ The SECI bid marked a big transition towards system-friendly RE procurement that will allow DISCOMs to procure more RE at lower generation and integration costs. Based on the success of RTC power tenders, the Ministry of New and Renewable Energy announced its intention to only use RE auctions for RTC power and RE hybrid projects (e.g., those combining wind and solar power to generate electricity during day and night). This move is expected to make clean power more competitive against traditional thermal power plants. These new procurement approaches address RE challenges including variability, limited hours of supply and low-capacity utilization of transmission infrastructure.

³⁹ The webinars on RE procurement focused on Procurement Design and Bidding Simulation and RE Project and Procurement Bankability, and took place August 18–19, 2020. Participants watched simulations that illustrated the pros and cons of different procurement methods, demystified power procurement and implementation agreements, and suggested tools for reducing project risks.

⁴⁰ To learn more about USAID's recommendations, see the PACE-D 2.0 RE white paper, "System-Friendly Competitive Procurement for Renewable Energy in India" which highlights global examples of successful large-scale RE procurement designs, such as time-based incentives and penalties, aggregators or virtual hybrids, and the procurement of physical hybrid solutions and locational signals.

Other key results in energy procurement reforms are as follows:

- USAID supported the Gujarat Electricity Regulatory Commission with innovative tariff recommendations that the Commission accepted in its tariff orders for 2020. The new tariffs, that call for utilization of solar generation during evening peak demand time with the help of energy storage, will set the price of electricity for large commercial, industrial and residential customers based on the time of usage.⁴¹ Second, USAID and Energy Efficiency Services Limited, the world's largest public energy service company, launched a large-scale program for retrofitting buildings to improve air quality and enhance energy efficiency across India. A \$10 million tender, floated to select vendors for implementing the program, was awarded to the United States-based Carrier Global Corporation in India. With U.S. companies' technological edge in air conditioning and air-quality monitoring and India's rapid growth in building stock, this program will open new markets for U.S. companies in South Asia.
- To enable advanced technologies, private sector investments, and transparent procurement, USAID crafted a white paper to define global, system-friendly RE procurement practices and recommended guidelines. The Solar Energy Corporation incorporated these USAID-provided best practices and launched the second round of tender to a bid of 5GW (worth \$4 billion) of round-the-clock power, marking a significant transition toward system-friendly RE procurements in India that lower the overall generation and integration costs. USAID also developed strategies for Indian Railways, one of India's largest electricity consumers, to adopt large-scale RE.
- USAID partnered with India's largest public energy service company, Energy Efficiency Services Limited (EESL), in designing and implementing public charging stations for electric vehicles in India. With USAID's support, EESL released a bid to install 3.7 million air-filtration systems fitted with air conditioners and ventilation equipment in buildings across India. USAID also supported the performance-specifications design for green air conditioners in partnership with the Indian Government Marketplace. USAID efforts in efficient buildings and equipment saved 224,021 megawatt hours (MWh) and led to a reduction of 183,697 metric tons of GHG. Moreover, USAID developed a state-of-the-art Strategic Energy Planning Framework/Tool to help DISCOMs establish robust demand forecasts and RE resource plans, optimizing power systems and minimizing expenditures.
- USAID/India also established the institutional infrastructure and capacity requirements to manage and pilot the world's first trading program for credits for particulate air pollution in Surat, Gujarat. The initial pilot emissions trading system demonstrated a 29 percent reduction in particulate matters from baseline at a lower cost by the participating industries. USAID further supported several SMEs in the Tiruper textile clusters to adopt clean technologies through the Clean Energy Accelerator initiative resulting in 300 KiloWatts of rooftop solar installed and 3,000 MWh of energy saved. Best practices and lessons learned from Tirupur were used to create an in-depth assessment of the Bangladesh textile industry.
- USAID/India in partnership with United Nations Environment Programme (UNEP), developed the Sustainable Public Procurement framework for India with technical specifications for room air conditioners as the first product to be incorporated for SPP. This will be integrated in the public procurement portal Government e-Marketplace (GeM) for launching green air conditioners.

⁴¹ These changes will encourage customers with rooftop solar systems to install batteries, charge them during the day, use that stored energy during peak-demand time for grid-connected power, and reduce electricity bills. Utilities will benefit as consumers will not be feeding solar energy during the day when there is low demand and rather, utilize stored power in the evening to reduce evening peak demand.

Indonesia: USAID built PLN’s capacity to plan, procure and integrate RE by developing standards and providing online training for a total of 231 staff over a four-month period. These activities will increase transparency and create a level playing field for private and independent project developers. USAID, in collaboration with several Indonesian agencies produced a PPA handbook on RE for financial institutions. USAID disseminated the handbook to banks and other financial service institutions at a virtual event in June 2020. USAID also completed an environment assessment training module in July 2020 for Bank Central Asia (BCA), one of Indonesia’s largest private banks, which will allow the institution to assess potential investments in RE and to release loans for energy projects.⁴² The newly developed environment module consists of concepts, regulations, case studies, exam questions and templates for due diligence. By incorporating this module into their internal learning program, BCA expects staff will acquire the skills necessary to apply sustainable principles in assessing RE projects and increase sectoral investment. Finally, in parallel, USAID assisted Bappenas and PT Sarana Multi Infrastruktur (PT SMI), a state-owned infrastructure financial institution, in the implementation of the “Sustainable Development Goal (SDG) Indonesia One” financing platform, established to support the GOI to achieve SDG #7 Affordable and Clean Energy. In FY 2020, USAID assisted PT SMI in conducting a technical and financial review for a 35 MW municipal waste-to-energy project in Jakarta and rooftop solar PV projects, as well as producing investor-briefs of 13 on-grid and off-grid RE projects for Bappenas’s blended financing forum.

Nepal: In FY 2020, USAID supported policy development and training to governmental and private stakeholders favoring sustainability in the energy sector. In collaboration with other development partners, USAID’s NHDP Activity provided further drafting support to MOEWRI and other GON institutions to develop an Electricity Act which includes provisions on competition for projects and markets, mandates third party access to networks, establishes a new electricity trader under the regulatory control of the ERC, calls for the development of a least cost generation plan and a plan to more effectively allocate Nepal’s water resources. The Cabinet presented the bill to Parliament for enactment. When enacted, these new provisions will increase transparency in energy procurement, increase market access and increase efficiency resulting in an electricity sector that is more reliable, affordable and sustainable.

Second, the Activity organized a training on Bidding and Contracting Models for Hydropower Projects for 30 participants from the Department of Electricity Development (DoED) and MOEWRI. In FY 2020, NHDP engaged extensively with the private sector Independent Power Producers Association (IPPAN) regarding the regulatory process and development of the new Electricity Act; and was a ‘Knowledge Partner’ at Nepal’s Power Summit. The Activity also supported transparency in the raising of FDI, and helped the GON develop a Clear Choice approach for transparent selection of potential projects based on a competitive procurement standard, while including a mechanism to allocate compensation for locally affected communities. This guidance resulted in the GON drafting the Upper Trishuli-I (UT-I) Project Development and Power Purchase Agreements, which increased the use of competitive procurement in the energy sector and is the first FDI hydropower project to employ conventional commercial financial mechanisms with respected international lenders.⁴³

⁴² Since 2015, USAID has assisted BCA in assessing potential RE investments, leading to the release of \$106 million in loans for seven RE projects that will deliver approximately 68.1 MW to 775,600 people.

⁴³ This list of trusted and transparent actors includes World Bank Group members, Asian, Korean, and European institutions, and the Organization of the Petroleum Exporting Countries Fund for International Development. When the Nepal Water and Energy Development Company concluded UT-I’s financing agreements, the projected FDI amounted to 2.6 percent of Nepal’s GDP and paved the way for other reputable actors to invest in Nepal, advancing the Clear Choice model for energy security and sustainability in the Indo-Pacific region.

Asia EDGE Outcome 4: Regional Integration and Energy Trade Across Indo-Pacific Region Increased

Cross-border electricity and gas trade can substantially enhance regional energy security, diversification and access and unlock billions of dollars in regional energy markets. Increased regional integration and energy trade could result in notable benefits for both individual countries and for the region by expanding service territories and allowing generation facilities to respond to varied cross-border load demands. More interconnected grids and enhanced power trade across borders play a key role in integrating RE throughout the region and meeting regional energy demand.

RDMA: USAID supported regional integration through collaboration with other agencies and work on processes and multilateral power trade discussions. With JICA, USAID hosted a workshop for donors (USAID, Japan, New Zealand) and the Lao PDR government counterparts to discuss how to strengthen power generation and interconnection planning in Lao PDR and facilitate electricity cross-border trade in the region. It provided a critical opportunity to share technical information that can be used across the projects to further coordinate transmission planning efforts. The joint workshop also highlights the Japan-U.S. shared commitment to enhance regional power trade and integration for a free, open, and stable electricity market.

Second, as mentioned in Outcome I, USAID CPA and the NREL provided feedback at the AIMS III Technical Review Group meetings to improve the modeling and planning processes and capture the potential for RE deployment, which will help to improve energy security, accessibility, affordability and sustainability in ASEAN member states, as well as support broader development goals across the Indo-Pacific region. USAID facilitated a RE learning webinar series that aimed to strengthen the capacity of local investors and utilities to partner with American companies and accelerate the deployment of RE generation. In April 2020, USAID CPA engaged nearly 300 participants during its second webinar in an RE learning series on financing large-scale solar, wind and biomass plants. The webinar reflected industry best practices in analyzing RE project financing and expanding new market opportunities for U.S. firms.

To meet increasing energy demand across Southeast Asia, USAID/RDMA, through CPA and the Advanced Energy Partnership for Asia Activities, provided specialized expertise to AIMS III, to facilitate power trade across countries and increase clean energy access. Due to continued COVID-19 travel restrictions, these activities held a series of virtual meetings with ASEAN member states and partners during the year, including the ASEAN Centre for Energy (ACE) and the Heads of ASEAN Power Utilities/Authorities. At the latest meeting, ACE presented progress made under AIMS III, including the feasibility of achieving existing, and/or setting higher RE targets by 2040.

In FY 2020, USAID/RDMA continued coordinating and supporting energy sector activities across Southeast Asia through the Asia EDGE Hub which serves USAID/RDMA, USAID/Washington, bilateral missions, and implementing partners through technical support on energy programming, strategic communications products and MEL. In FY 2020, while travel restrictions associated with the COVID-19 pandemic threatened to stall USAID power sector training activities, USAID/RDMA, through the Asia EDGE Hub, collaborated with implementing partners, host countries and donor partners to deliver online webinar training covering sustainable energy topics through the Asia EDGE Power Sector Learning Series. These webinars not only maintained the momentum of USAID/RDMA capacity-building initiatives in Southeast Asia, but also delivered specialized virtual training at a larger scale to over 830 power sector stakeholders from 39 countries who might otherwise not have had the opportunity to participate. The webinars demonstrated USAID/RDMA's ability to extend its reach through cost-effective collaboration with private and public sector organizations to share U.S. and regional best practices.

In FY 2020, the Southeast Asia EDGE Hub served as the primary coordination point for all of USAID's engagement at the Asian Development Bank's Virtual Asia Clean Energy Forum which attracted over 4,600 participants. USAID/RDMA participated in Forum eight sessions, including the opening and closing plenaries, deep dive workshops and technical sessions.

South Asia Regional: The COVID-19 pandemic created numerous challenges for the South Asian energy sector since March 2020. As a part of the "South Asia Knowledge Series" aiming to exchange experiences and formulate best practices in South Asia, two USAID activities, SARI/EI and SAREH, co-organized a webinar that brought together leaders from power distribution companies across the region. Panelists discussed measures adopted to deal with COVID-19 impacts including automation and digital technologies in metering, billing, collection, operation and maintenance. The webinar introduced USAID's "South Asia Distribution Utility Network," which will offer similar knowledge-sharing opportunities. Such practices will increase resiliency and help fortify the region's power distribution sector against future crises.

USAID also released several papers highlighting regional integration topics including:

- *Prospects of Regional Energy Cooperation and Cross Border Energy Trade in the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) Region*⁴⁴ which provides background on the prospects of regional energy cooperation and cross-border energy trade (CBET), and describes potential synergies in energy cooperation such as the diverse energy mix, diversities in demand and generation pattern, and sustainable energy generation that would result in improved economics. The publication also diagrams the role played by various development partners on regional energy cooperation efforts in the region and recommends a strategy and roadmap for energy sector integration in the BIMSTEC countries to achieve energy efficiency.
- USAID also released *Impact of COVID-19 Pandemic on the South Asian Power Sector* which shares regional best practices dealing with the different challenges in power system operation that arose due to reduced demand and analyzes the robustness of the operating systems and principles in the region and discusses how the standard systems and procedures can be refined further to better meet such contingency situations in future.
- USAID published *Successful 9 PM, 9 Minute Event Highlights the Outstanding Cooperation in Electricity Grid Management in South Asia* which further highlighted the benefits of regional energy cooperation and an integrated grid. The paper demonstrates that cross-border electricity trade can facilitate grid balancing in an economical manner and manage the variability of renewable energy.

Bangladesh: USAID/Bangladesh and USAID/India worked in cooperation with BIMSTEC to jointly organize the first conference on "Enhancing Regional Energy Cooperation in the BIMSTEC Region" in Dhaka in February 2020. The conference helped improve energy cooperation among the BIMSTEC countries, and USAID reiterated the U.S. Government's commitment to South Asian prosperity and economic development through energy connectivity.

India: To advance Asia EDGE's regional energy trade and integration goals,⁴⁵ USAID's South Asia Regional Program focused on accelerating regional power trade by transitioning from bi- to tri- and multilateral trading modes and establishing a vibrant regional power market. In FY 2020, USAID/India

⁴⁴ Bangladesh, Bhutan, India, Burma, Nepal, Sri Lanka, and Thailand.

⁴⁵ USAID's efforts in FY 2020 led to trading 7,489,000 MWh of power in South Asia, facilitated 5184 MW capacity of renewable energy, saved 227,063 MWh of electricity, and mobilized \$176 million in clean-energy investments.

programs organized workshops in Bhutan, India, Bangladesh and Nepal and worked on building national institutions' capacities in Bangladesh, Bhutan, and Nepal, countries already connected to the Indian grid, to establish a future power trading entity and participate in the Indian power exchange.

USAID gained consensus and support from key decision makers and stakeholders on the need to move the South Asia power market from bilateral to trilateral and multilateral trade. This effort culminated in the draft Electricity (Amendment) Bill, 2020, released by the MOP and GOI in March 2020 to amend India's core energy legislation, the Electricity Act of 2003. The new bill, which is still a draft as of Q3 2020, acknowledges the role of cross border electricity trade for optimum utilization of power generation resources in South Asia. The Draft Amendment Bill empowers the Indian Central Government to prescribe rules and issue guidelines for allowing and facilitating cross border trade of electricity, setting the stage for increased electricity trading in the region.

In June 2020, India introduced RTM for power trading, paving the way for a more efficient electricity market and smooth integration of RE; this development could enhance cross-border electricity trade among South Asian countries and create a regional power pool benefiting producers and consumers in participating countries. With the launch of the RTM, electricity distribution companies will be able to purchase millions of units of power in spot markets just an hour before delivery to help mitigate the risks from inaccuracy in demand forecasting and unpredictable renewable generation. USAID also supported the Indian system operator in designing the framework for an IT-based market participant registration system to aid RTM implementation. USAID launched a coordination and communication hub which engineered a meeting of South Asian DISCOMs which agreed to establish a regional Distribution Utility Network to facilitate knowledge sharing to accelerate transition.

USAID supported the Indian Central Electricity Regulatory Commission (CERC) with detailed modelling and market simulations to test options, and both validated and refined design parameters for the RTM. USAID supported CERC to draft its Statement of Reasons, and to compile and respond to stakeholder comments on the RTM framework. USAID also coordinated international knowledge exchanges for CERC, the national load dispatch center and other key stakeholders, which secured needed buy-in across India's power sector. In the first day of the RTM launch, a staggering 3.4 million units of power were traded on the India Energy Exchange (IEX) platform. In June, more than 500 million units were traded on IEX.

USAID continued to engage regional bodies such as SAFIR and the BIMSTEC Initiative. The program helped establish a separate regulator working group under SAFIR, develop a common minimum grid code, identify regulatory interventions for grid discipline, and develop a regulatory roadmap for electricity trade in South Asia. The program organized a conference with SAFIR on energy cooperation in South Asia and an executive exchange for South Asian regulators to participate in public hearings in India. Finally, the program initiated two independent regional forums, the South Asia Forum for Transmission Utilities and South Asia Forum for System Operators, and is currently finalizing frameworks in consultation with member countries.

The USAID South Asia Regional Program also analyzed the role of regional energy cooperation in combating COVID-19's economic impacts. One report examined India's "9 P.M. 9 Minutes" event, looking at the role countries' system operators, in conjunction with Bhutan's hydro-resources, played in addressing load-fluctuation. A separate report highlighted how regional energy collaboration helps countries economically source power.

Nepal: In 2020, NHDP provided an in-depth review of the 2003 Indian Electricity Act (with updates from 2014), including its effects on licensing, regulation, and federalism and a clear plan developing a market structure to facilitate regional trade. NHDP provided continuous updates, workshops and

training to project counterparts on India's measures to implement the 2014 Power Trading Agreement between Nepal and India, including the Guidelines on Cross Border Energy Trade (CBET) issued by India's MOP and the regulations issued by the Indian CERC. These activities enable the GON to identify the steps and necessary actions for both countries to increase cross border electricity trade.

During the COVID-19 lockdown, NHDP delivered two reports on CBET, to the MOEWRI, the DoED, and the ERC, which highlighted the most important factors to drive hydropower exports from Nepal to Bangladesh. The Nepal Electricity Authority (NEA) asked for NHDP's support to conclude a 50/50 joint venture with Power Grid India to establish a Special Purpose Vehicle to develop the Indian portion of the Butwal-Gorakhpur Transmission Line. This line is important for the Millennium Challenge Corporation Compact for Nepal. NHDP led the Joint Venture Agreement negotiations which, despite COVID-19 delays, is now close to being signed.

Realizing the need for Nepal to build its capacity in power trading, USAID/Nepal coordinated with the NEA and facilitated USAID's South Asia Regional Initiative for Energy Integration (SARI/EI) to conduct a 10-day power trading course for 25 participants from Nepal. The majority of the participants were from NEA, with some from the ERC, MOEWRI and the private sector.

In FY 2020, NHDP led a GON delegation, including representatives from MOEWRI and ERC to Tbilisi, Georgia for a capacity building and knowledge sharing program on energy policy and legal reform. The training helped equip Nepali participants to navigate the geopolitical issues around exporting energy.

Asia EDGE Cross-Cutting Outcome I: Established Regulatory Systems Including Implementation of Environmental Safeguards

In addition to the three IPS-wide CC Outcomes, the Asia EDGE results framework introduces a sector-specific CC Outcome on the inclusion of environmental safeguards in regulatory systems (CC I).

Bangladesh: In FY 2020, USAID partnered with NARUC and provided technical assistance to the BERC under the Bangladesh Energy Regulatory Partnership Program (ERPP), including regulatory oversight and enhancing BERC's dispute resolution process, following international best practices to allow for greater transparency and improved oversight, and therefore to contribute to the necessary network upgrades determination to ensure consumer satisfaction and eventually result utility modernization investments.

Indonesia: To improve the regulatory systems, USAID built capacity of 32 national and sub-national institutions and assisted in developing 75 policies, standards and guidelines in sustainable finance, energy planning, clean energy and power generation and low carbon development at different stages (proposed, adopted, implemented).

Nepal: In FY 2020, the NHDP continued providing transaction advisory support to facilitate the development and financial closure of large hydropower projects. USAID, through NHDP, partnered closely with the Office of the Investment Board of Nepal (OIBN), MOEWRI, the new ERC, and the NEA. This collaboration culminated in the financial closure of the 216 MW Upper Trishuli-I (UT-I) hydropower project (HPP).

Vietnam: In FY 2020, USAID/Vietnam awarded the Vietnam Urban Energy Security Activity which supports two main cities in Vietnam, Da Nang and Ho Chi Minh, to harmonize national strategies, policies and regulations that encourage the deployment and investments of cost-effective distributed

clean energy solutions. The Activity also supported Vietnam Electricity (EVN) to develop an online solar platform to promote rooftop solar development using online calculating tools and technical materials.

IPS Cross-Cutting Outcome: Private Sector Engagement

Private sector engagement (PSE) is a CC Outcome for all IPS Initiatives/Program Focus Areas.

RDMA: In FY 2020, USAID/RDMA engaged the private sector as a means to increase sustainability and impact of USAID/RDMA's environment portfolio in Asia. USAID/RDMA hosted several virtual meetings and webinars with U.S. and other natural gas private sector stakeholders to present information on the U.S.-Asia Gas Partnership (AGP), collect feedback on investment barriers and other priorities among AGP-member countries, and discussed opportunities for further public-private collaboration.

USAID/RDMA co-organized and hosted the monthly Asia EDGE Power Sector Learning Series where more than 800 people (36 percent of whom were from the private sector) from 39 countries attended the event, covering RE project financing, advanced deployment of modern energy technologies and corporate procurement practices, among other topics. Through the CPA and the Advanced Energy Partnership for Asia Activities, USAID/RDMA collaborated with ASEAN to facilitate PSE in multilateral power trade across Southeast Asia. USAID/RDMA also partnered with Thailand to develop best practice battery energy storage system standards which will accelerate private sector-led advanced RE systems deployment. Through CPA, USAID/RDMA leveraged a diverse range of private partnerships to accelerate deployment of clean energy solutions across the region. In FY 2020, the Activity more than doubled its Year 4 targets by facilitating \$590 million in investments to add 606 MW of new RE generation capacity. This includes \$8.13 million and 8.75 MW of solar rooftop capacity on nine Big C supermarket stores in Thailand. CPA also helped structure Sermsang's \$115 million, 48 MW wind power project in Vietnam.

Bangladesh: USAID/Bangladesh actively engages with the private sector, especially RE project developers. In FY 2020, USAID published documents to strengthen Bangladesh's RE sector's development. The white paper, "[Challenges to the development of variable renewable energy \(VRE\) in Bangladesh](#)", outlines barriers to scaling up VRE in Bangladesh and presents solutions to spur growth in grid-connected renewables. The "One Stop Service" document provides much of the necessary information and resources for wind project development, with points of contact and web links for further reference.

Additionally, under the USAID-NREL partnership, USAID focused on improving RE data and tools, providing state-of-the-art approaches and technical assistance to scale up wind energy deployment and grid integration capacity and knowledge with GOB and private sector stakeholders. The WPCB Activity hosted an in-person private sector roundtable to understand key challenges and barriers to market entry in Bangladesh.

India: USAID is leveraging private sector resources, opening new markets for U.S. private sector investors, and contributing to a transparent, competitive marketplace for more than \$300 billion in clean-energy technologies and services in India. USAID/India partnered with the Confederation of Indian Industries to implement a vendor rating system for rooftop solar systems. USAID also developed an Industry Readiness Protocol toolkit for COVID-19 to help industries safely resume operations after the lockdown.

USAID/India also worked with seven institutions and three associations in the textile industry in Tirupur on clean-energy and skill-building. Engagement with these institutions allowed USAID's efforts to

continue after the Tirupur program ended in 2020. To expand these positive effects across South Asia, best practices and lessons learned from Tirupur were used to assess the Bangladesh textile industry and were shared with Bangladesh industry stakeholders. USAID/India also worked with the Indian MOP to develop a PSE strategy in the Smart Grid Knowledge Center, standard procurement documents for smart meters, and distribution utility privatization models. USAID/India aided EESL to develop an investment business plan for a chiller-replacement program as well as assess market opportunities for chiller replacement, which could establish a \$1.5 billion market in India by 2030.

Indonesia: In FY 2020, USAID mobilized a total of \$44.8 million in investment, including private investment of \$19.8 million for one biomass and one hydropower project financed by Indonesian banks, and a \$25 million loan from the World Bank for PLN to expand the distribution power grid.

Nepal: The private sector is a major actor in Nepal's hydropower production. In FY 2020, the NHDP supported the GON in negotiating the UT-I⁴⁶ Project, the first FDI hydropower project to employ conventional commercial financial mechanisms. USAID worked with the GON negotiating team and the developer, Nepal Water and Energy Development Company. It assisted the GON to establish the UT-I Project Development Unit under the DoED. NHDP helped develop a uniform approach that the GON can use to provide compensation and benefits to people affected by the project, including a mechanism to allocate local shares. NHDP also assisted in developing a standardized approach to disaster management to be implemented by all hydropower developers. USAID also supported the private sector through extensive engagement with members of the IPPAN.⁴⁷ In FY 2020 NHDP engaged extensively with IPPAN regarding the regulatory process and development of the new Electricity Act and actively engaged in Nepal's Power Summit in FY 2020.

Vietnam: In FY 2020, V-LEEP engaged private sector partners to facilitate the deployment of bankable rooftop solar and other RE solutions and advocated for the DPPA pilot scheme which will enable large-scale investors to finance RE for their industrial/commercial operations and sell excess power back to the grid. This is currently pending GON approval.

IPS Cross-Cutting Outcome: Gender and Social Inclusion

Gender equality and social inclusion (GESI) is a CC Outcome for every IPS Initiative and Program Focus Area. Preliminary results are summarized below by OU.

RDMA: To promote gender inclusion in Southeast Asia's energy sectors, USAID/RDMA, through the Southeast Asia EDGE Hub, developed a Southeast Asia annex⁴⁸ to the USAID Gender and Energy 101 Toolkit, allowing USAID personnel to better understand and address the formal and informal barriers to gender integration in Southeast Asia's energy sectors.

CPA showcased female leadership in RE in Southeast Asia through the "*Unleashing the Power of Women in Energy: A B.Grimm Power Success*" published on the CPA website. USAID/RDMA also focused inward

⁴⁶ UT-I will provide electricity to 9 million of Nepal's 29 million people and create 53,000 jobs over the project's life. It will also offset 1.3 million tons of carbon dioxide annually. The FDI raised will amount to 2.6 percent of GDP and will provide \$706 million in taxes and royalties to the GON over its 35-year concession term.

⁴⁷ IPPAN is composed of hundreds of small and medium hydropower developers and accounts for approximately 50 percent of the country's generation capacity.

⁴⁸ The Annex consists of an overview of gender and energy issues in Southeast Asia; key questions to ask while conducting gender analyses; a list of Southeast Asia-specific resources that target gender and/or gender integration issues; and a reference list of the gender-specific indicators that development partners and institutions use in Southeast Asia.

by providing information to the women in the REChampions network, ensuring they remain engaged in the industry despite the limiting measures resulting from the COVID-19 pandemic.

South Asia Regional: In response to disproportionate male representation in the South Asian power sector, USAID launched the South Asia Women in Energy (SAWIE) Initiative to promote women’s leadership, mentor women from mid-level positions into leadership roles, and develop policies to advance gender parity and equity in South Asian utilities.⁴⁹ In FY 2020, SAWIE organized several events including a webinar on clean cooking best practices and opportunities for women entrepreneurs, as well as a virtual event “Role of Women in Energy Dialogue,” in which several senior-level women panelists participated. SAWIE also organized a brainstorming discussion in which chief human resource officers from leading energy companies deliberated case studies to promote women’s participation.

Bangladesh: USAID/Bangladesh promotes gender balanced participation in all its activities and aims to include at least 30 percent female participation in its capacity building workshops and webinars to support more gender balance. To address low women’s participation in electricity sector utilities, USAID identifies ways to engage women, encourages them to participate in energy sector operations, and helps to reflect female voices in decision-making processes. Gender-diverse workforces are good business practices and that gender equity in energy regulation improves economic prosperity for all citizens. USAID supports women to participate in the energy sector as energy users, employees, participants in the energy value chain, and as decision-makers and stakeholders. These roles intersect with many areas over which energy regulators have jurisdiction, including tariff-setting, licensing, interconnection, ensuring reliability, procurement, rural electrification, stakeholder engagement and internal human resource policies.

Regulators can use these jurisdiction areas to empower and support women as employees and policymakers, consider gender-differentiated impacts of regulatory policy and energy decisions on users, and identify ways to minimize negative impacts from infrastructure projects to strengthen vulnerable populations’ livelihoods. Through the ERPP Activity, USAID will continue to encourage BERC to consider gender inclusion when nominating staff to participate in partnership activities. USAID anticipates that the remote activity formats planned for FY 2021 may expand access to activities for BERC staff which may help remove barriers to female staff participation.

India: USAID organized a workshop on “Gender Balancing for Renewable Energy Development” in partnership with an Indian distribution utility. In FY 2020, 4,445 women received USAID-funded technical training in the energy sector.

Indonesia: In FY 2020, USAID trained a total of 2,396 people, of whom 28 percent were women, in energy conservation, energy planning, grid integration, GHG emission measurement, energy planning and renewable energy assessment. To measure women’s sense of self-efficacy, USAID conducted surveys in each training, in which all female participants reported a sense of increased capacity, knowledge, confidence and technical expertise in the energy sector. The surveys resulted in 97.8 percent self-efficacy among female participants.

Nepal: USAID’s NHDP supported the GON to include robust environmental, disaster management, and GESI provisions in PDA. NHDP supported the financial closure of the UT-I project, developed by the private sector. With NHDP assistance, the PDA required developers to submit to the GON their plans and activities for approval on the following topics:

⁴⁹ SAWIE currently has 66 members and over 1000 followers on LinkedIn. At a recent meeting, SAWIE’s steering committee reviewed its 2021 work plan and communication strategy.

- Corporate Social Responsibility investments in impacted communities, including health, education, community infrastructures, and programs;
- Local community residents' employment, disaggregated by gender, caste and ethnicity;
- Local procurement of goods and services, including from women-owned businesses;
- Commitment to increase connections through “free” local electricity for poor households;
- Small business development for required goods and services where gaps exist, particularly focused on developing women-owned businesses, Dalits, Janajatis or other marginalized groups;
- GESI criteria in monitoring to enable supplier accountability for social inclusion;
- Evidence of existing supplier diversity programs to include women-owned businesses;
- Evidence of substantial female ownership, board membership and/or company leadership;
- Evidence of a commitment to diversity and inclusion in Human Resources policies and practices;
- Develop tools for GON to ensure such provisions are monitored and enforced.

NHDP helped develop a uniform approach the GON can use to provide compensation and benefits to people affected by local projects, including a mechanism to allocate local shares, and assisted to develop a standardized approach to disaster management to be implemented by all hydropower developers. After the completion of the PDA, NHDP carried out the Free, Prior, and Informed Consent process, which protects indigenous peoples' right to participate in decision making.

Vietnam: V-LEEP developed a tool that is tailored to the Vietnam context, assists RE developers on gender mainstreaming, and complements existing efforts in the gender and RE ecosystem. In Year 5, V-LEEP will pilot this tool by incorporating it within DPPA training programs with local stakeholders. V-LEEP will socialize the tool with advisory contacts, such as the International Union for the Conservation of Nature (IUCN), whose *“Making the Case for Gender Equality in Large-Scale Renewable Energy Infrastructure Development”* report catalyzed V-LEEP's gender mainstreaming efforts. V-LEEP will monitor and evaluate the tool and identify champions to promote long-term integration in RE development activities.

IPS Cross-Cutting Outcome: Civil Society Engagement

CSE is one of three IPS-wide CC Outcomes. Below are a series of preliminary results.

RDMA: The USAID Southeast Asia EDGE Hub, CPA, and the Advanced Energy Partnership for Asia worked primarily with partner country governments and the private sector in FY 2020 to support energy sector transformation across the Southeast Asia region. USAID/RDMA's engagement with civil society under these activities focuses mainly on communications outreach via social media (Twitter, LinkedIn) and email targeting public and private sector stakeholders in the Southeast Asian energy sector.

South Asia Regional: In FY 2020, USAID continued its partnership with local, regional and U.S. think tanks and academic institutions to achieve IPS Goals. The Agency collaborated with the University of Chicago (UofC) and the Institute for Sustainable Communities (ISC) to support innovative solutions to air pollution in South Asia. With UofC, USAID piloted a market-based emissions trading Activity with 340 local industries to address air pollution. Further, USAID supported ISC's work with SMEs to promote clean energy adoption and skill-building for the textile industry. USAID also continued its

partnership with a regional think tank, Integrated Research and Action for Development, to promote cross-border power trade as a part of its SARI/EI program.

Through SARI/EI, USAID/India launched the [Think Tank Forum](#) comprising a South Asian Civil Society Organization network to build consensus and advocate on regional grid integration and cross-border power trade issues. The network has 20 members and conducted five studies on the benefits of cross-border power trade and its connection to nationally determined RE contributions. In FY 2020, the Nepali Parliamentary Committee reached out to USAID to organize a workshop for parliamentarians across the region on cross-border power trade. This led to the regional parliamentary network in South Asia concept focused on energy cooperation. A white paper is being developed to define the need for such a forum, its role and responsibilities and approaches to sustainability. In FY 2021, USAID will focus on creating consensus and organizing events with regional parliamentarians.

Bangladesh: In FY 2020, USAID actively engaged with energy focused civil society entities such as academia, research organizations, NGOs/Non-profit organizations, and industry associations (Bangladesh Independent Power Producers' Association, Energy Department of the Consumers Association of Bangladesh, Bangladesh Solar and Renewable Energy Association) through the SURE and WPCB Activities to inform white papers and capacity building activities.

Indonesia: The current USAID/Indonesia energy program does not have activities engaging civil society as it primarily focuses on PSE and improved governance to support energy sector transformation.

Nepal: For the first time in Nepal's history, in FY 2020, electricity sector regulation was conducted through transparent and fair procedures that ensure the opportunity for all stakeholders to participate in the process and voice their views on regulatory matters. Public expectations and media attention were high and the ERC decided to meet the public demand in May 2020, so USAID's NHDP Activity worked with the ERC to conduct the hearing live, remotely, and online. The hearing attracted 290 participants across all consumer classes, including households, businesses, and industry. Participants actively participated in the process and stakeholders expressed their appreciation for the ERC's efforts to fulfil the transparency requirements of the tariff setting process, as well as for using modern technologies, such as ZOOM, Facebook, and YouTube. The ERC also conducted multiple stakeholder and consumer engagement activities remotely during the COVID-19 lockdown, through its website, media, and other communication channels.

Vietnam: USAID did not engage directly with civil society under V-LEEP or the new Vietnam Urban Energy System (VUES) Activity. Instead, these Activities work directly with the GVN, policy makers, the utility, and private sector (including banks, investors, project developers).

ANNEX II. QUANTITATIVE RESULTS FOR INDICATORS

Asia EDGE uses a mix of standard, custom, and special qualitative narrative performance indicators. Six OUs provided indicator data for this reporting period. Aggregated FY 2020 results are in Table 3 below, with links to indicator details (including OU-level and disaggregate data) in separate tables immediately following.

TABLE 3: FY 2020 INDICATOR RESULTS SUMMARY

Goal/Outcome	Indicator	Total
Goal: Energy sector transformed to accelerate energy security and sustainability in the Indo-Pacific region	G1a: Amount of investment mobilized in USD for energy projects as supported by USG assistance (EG.7.2-1)	\$285,135
	G1b: Amount of investment mobilized in USD for clean energy as supported by USG assistance (EG.12-4)	\$1,370,212,000
	G2: Number of beneficiaries with improved energy services due to USG assistance (EG.7.1-1)	1,468,590 beneficiaries
	G3: Generation capacity (MW) installed as supported by USG assistance (custom)	688.81 MW
Outcome 1: Performance of energy utilities improved	O1.1: Percent of energy utilities with improved financial and/or operational performance as supported by USG assistance (custom)	100%
Outcome 2: Deployment of advanced energy systems increased	O2.1 Generation capacity (MW) supported by USG assistance that has achieved financial closure (custom)	6,017.5 MW
	O2.2 Amount of energy (MWh) saved from energy efficiency as supported by USG assistance (custom)	230,283 MWh
Outcome 3: Transparent, best-value procurement adopted	O3.1: Percent of procurements using RFPs, auctions, or similar processes, as supported by USG assistance (custom)	100%
	O3.2: MW competitively procured, as supported by USG assistance (custom)	80 MW
Outcome 4: Regional integration and energy trade across Indo-Pacific region increased	O4.1: Amount of electricity (MWh) traded as supported by USG assistance (custom)	7,489,000 MWh
Cross-cutting Outcome 2: Regulatory systems	CC2a: Number of laws, policies, regulations, or standards to enhance energy sector governance formally proposed,	9 laws, policies, regulations, or standards

Goal/Outcome	Indicator	Total
including implementation of environmental safeguards	adopted, or implemented as supported by USG assistance (EG.7.3-1)	
	CC2b: Number of laws, policies, regulations, or standards addressing clean energy formally proposed, adopted, or implemented as supported by USG assistance (EG.12-3)	53 laws, policies, regulations, or standards

TABLE 4: FY 2020 GOAL 1A INDICATOR RESULTS

Goal/Outcome: Goal: Energy sector transformed to accelerate energy security and sustainability in the Indo-Pacific region					
Indicator: G1a: Amount of investment mobilized in USD for energy projects as supported by USG assistance (EG.7.2-1)					
OU	Public, domestic	Private, domestic	Public, international	Private, international	Value
India	-	285,135	-	-	285,135
Indo-Pacific Total					285,135

TABLE 5: FY 2020 GOAL 1B INDICATOR RESULTS

Goal/Outcome: Goal: Energy sector transformed to accelerate energy security and sustainability in the Indo-Pacific region					
Indicator: G1b: Amount of investment mobilized in USD for clean energy as supported by USG assistance (EG.12-4)					
OU	Public, domestic	Private, domestic	Public, international	Private, international	Value
India	128,900,000	-	-	-	128,900,000
Nepal	-	-	-	700,000,000	700,000,000
South Asia Sub-total					828,900,000
Indonesia	-	19,800,000	25,000,000	-	44,800,000
RDMA	6,000	496,491,000	2,500	12,500	496,512,000
Southeast Asia Sub-total					541,312,000
Indo-Pacific Total					1,370,212,000

TABLE 6: FY 2020 GOAL 2 INDICATOR RESULTS

Goal: Energy sector transformed to accelerate energy security and sustainability in the Indo-Pacific region					
Indicator G2: Number of beneficiaries with improved energy services due to USG assistance (EG.7.1-1)					
OU	Clean energy, males	Clean energy, females	Non-clean energy, males	Non-clean energy, females	Value
Indonesia	732,632	735,958	-	-	1,468,590
Indo-Pacific Total					1,468,590

TABLE 7: FY 2020 GOAL 3 INDICATOR RESULTS

Goal: Energy sector transformed to accelerate energy security and sustainability in the Indo-Pacific region			
Indicator G3: Generation capacity (MW) installed as supported by USG assistance (custom)			
OU	Clean Energy	Conventional Energy	Value
India	0.3	-	0.3
South Asia Sub-total			0.3
Indonesia	139.65	-	139.65
RDMA	548.86	-	548.86
Vietnam	-	-	0 ⁵⁰
Southeast Asia Sub-total			688.51
Indo-Pacific Total			688.81

TABLE 8: FY 2020 OUTCOME I INDICATOR RESULTS

Outcome I: Performance of energy utilities improved			
Indicator O1.1: Percent of energy utilities with improved financial and/or operational performance as supported by USG assistance (custom)			
OU	Value		
India	100%		
Indo-Pacific Total			100%

TABLE 9: FY 2020 OUTCOME 2.1 INDICATOR RESULTS

Outcome 2: Deployment of advanced energy systems increased			
Indicator O2.1: Generation capacity (MW) supported by USG assistance that has achieved financial closure ⁵¹ (custom)			
OU	Clean energy	Conventional Energy	Value
India	5,184	-	5,184
Nepal	216	-	216
South Asia Sub-total			5,400
Indonesia	-	11.5	11.5
RDMA	606	-	606
Southeast Asia Sub-total			617.5
Indo-Pacific Total			6,017.5

⁵⁰ The reported value is zero.

⁵¹ Generation capacity from clean energy is also reported under EG.12-5, which is not a performance indicator for Asia EDGE.

TABLE 10: FY 2020 OUTCOME 2.2 INDICATOR RESULTS

Outcome 2: Deployment of advanced energy systems increased			
Indicator O2.2: Amount of energy (MWh) saved from energy efficiency as supported by USG assistance (custom)			
OU	Clean energy	Conventional Energy	Value
India	227,063	-	227,063
South Asia Sub-total			227,063
Vietnam	3,220	-	3,220 ⁵²
Southeast Asia Sub-total			3,220
Indo-Pacific Total			230,283

TABLE 11: FY 2020 OUTCOME 3.1 INDICATOR RESULTS

Outcome 3: Transparent, best-value procurement adopted				
Indicator O3.1: Percent of procurements using RFPs, auctions, or similar processes, as supported by USG assistance (custom)				
OU	RFPs	Auctions	Other Competitive Procurement	Value
India	-	-	100%	100%
Indo-Pacific Total				100%

TABLE 12: FY 2020 OUTCOME 3.2 INDICATOR RESULTS

Outcome 3: Transparent, best-value procurement adopted			
Indicator O3.2: MW competitively procured, as supported by USG assistance (custom)			
OU	Clean energy	Conventional Energy	Value
India	80	-	80
Indo-Pacific Total			80

⁵² This was calculated based on the baseline electricity consumption and the actual electricity consumption per year at the two plants that applied EE solutions.

TABLE 13: FY 2020 OUTCOME 4 INDICATOR RESULTS

Outcome 4: Regional integration and energy trade across Indo-Pacific region increased			
Indicator O4.1: Amount of electricity (MWh) traded as supported by USG assistance (custom)			
OU	Clean energy	Conventional Energy	Value
South Asia Regional	7,489,000	-	7,489,000 ⁵³
Indo-Pacific Total			7,489,000

TABLE 14: FY 2020 CROSS-CUTTING OUTCOME 2A INDICATOR RESULTS

Cross-cutting Outcome 2: Regulatory systems including implementation of environmental safeguards							
Indicator CC2a: Number of laws, policies, regulations, or standards addressing clean energy formally proposed, adopted, or implemented as supported by USG assistance (EG.7.3-1)							
OU	National, Proposed	National, Adopted	National, Implemented	Sub-national, Proposed	Sub-national, Adopted	Sub-national, Implemented	Value
Nepal	1	3	-	-	-	-	4
South Asia Regional	-	2	-	-	-	-	2
South Asia Sub-total							7
Vietnam	1	1	-	-	-	-	2
Southeast Asia Sub-total							2
Indo-Pacific Total							9

TABLE 15: FY 2020 CROSS-CUTTING OUTCOME 2B INDICATOR RESULTS

Cross-cutting Outcome 2: Regulatory systems including implementation of environmental safeguards							
Indicator CC2b: Number of laws, policies, regulations, or standards addressing clean energy formally proposed, adopted, or implemented as supported by USG assistance (EG.12-3)							
OU	National, Proposed	National, Adopted	National, Implemented	Sub-national, Proposed	Sub-national, Adopted	Sub-national, Implemented	Value
India	-	-	13	-	-	6	19
South Asia Sub-total							19
Indonesia	13	3	-	4	5	3	28
RDMA	4	1	1	-	-	-	6
Southeast Asia Sub-total							34
Indo-Pacific Total							53

⁵³ The results represent the total power traded in South Asia. The results are from a new regional hydropower project in Bhutan (Mangdechhu hydro power plant) that became fully operational in FY 2020. This large hydro project of 720 MW is contributing significantly to an increase of power traded in the region.

ANNEX III. METHODOLOGY

The Asia Bureau’s IPS Monitoring, Evaluation, and Learning (MEL) approach includes a performance monitoring and reporting system that culminates in quarterly and annual reporting from all IPS OUs. IPS reporting is grounded in Theories of Change for each IPS Initiative or Program Focus Area. Data submissions include quantitative data in the form of Performance Indicators, and qualitative narrative data for an annual Results Narrative, as well as Success Stories submitted on a quarterly basis. Data collection instruments include PIRS for performance indicators and detailed instructions for writing narratives for each Initiative or Program Focus Area. All data submissions are required-as-applicable, meaning that if OUs have programming that aligns with specific IPS Initiative or Program Focus Area objectives, they must be reported. Detailed guidance about IPS data reporting expectations was provided to all OUs.

IPS Missions were one of a group of early adopters of an agency-wide data reporting and performance management system known as Development Information Solution (DIS). FY 2020 was the first reporting year that IPS OUs used DIS, which is being rolled out to the entire Agency.

Data Sources and Data Collection Instruments

IPS data types, timelines, and links to original data (and their instruments) are summarized in Table 16:

TABLE 16. IPS DATA OVERVIEW

Reporting Area	Data Type	Periodicity	Original Data	Data Collection Instruments
Performance Indicators	Quantitative	Annual	DIS	PIRS
Results Narrative	Qualitative	Annual	DIS	Instructions
Success Stories	Qualitative	Quarterly	Success Story catalog	Instructions

Data Analysis

The overall purpose of analysis is to synthesize and organize the most high-level results according to each Initiative or Program Focus Area. The extent to which a particular result is considered “high-level” involves aligning data submissions with the relevant IPS Theory of Change, at the Goal or Outcome levels (i.e., de-emphasizing output level results).

The IP-MEL analysis team included performance monitoring specialists and a group of data analysts who were trained in data synthesis and organization using a right-fit approach for each IPS Initiative or Program Focus Area. The team used a different unit of analysis as appropriate, whether results made sense at the OU level, at the Goal or Outcome level, or otherwise. Data were first reviewed for completeness and accuracy, after which data clarifications were drafted for OUs and Asia Bureau points of contact to address. Any unresolved questions are footnoted throughout the report and will be updated on a rolling basis. Narrative data were then analyzed, using pattern analysis to elevate common themes from the Indo-Pacific region, as well as to identify and explain outliers as needed. Indicator data were checked for accuracy and added to the full data submission to present a more complete data “story.” Concurrently, the team made comparisons to FY 2019 and cross-checked results to ensure they were not repeated for multiple Initiatives or Program Focus Areas. The team incorporated contextual data using OU submissions and by consulting outside sources (cited as relevant).

Limitations

A list of main data limitations and their potential mitigation are highlighted in Table 17 below:

TABLE 17. DATA LIMITATIONS

Limitation	Mitigation Approach
Attribution: USAID interventions do not operate in a vacuum so the extent to which USAID can take credit for results can be limited.	Reporting guidance asks OUs to isolate USAID’s contribution to a result and provide adequate contextual data to explain the result’s significance. Data synthesis and additional research while drafting summary reports provides an added layer of assurance that results are traceable back to USAID support. Contextualizing results within a country’s operating environment helps to further isolate USAID’s contribution, but absolute attribution is difficult to attain.
Timeliness: by the time annual data submissions and analysis are complete, policy makers may be well on their way to making programmatic decisions.	Immediate programmatic decisions take place at the Mission or OU level. IPS reporting, like all Washington-based reporting, is done at minimum on an annual basis. Reporting purposes include learning and decision-making, as well as providing justifications for budgeting and Congressional earmarks. IPS data can also be used to develop and analyze longer-term trends.
Reporting bias and incomplete data: indicators and narrative data can only present so much information about a Mission’s entire portfolio.	Both indicator and narrative data are combined in the analysis approach and viewed holistically. Where possible, data are expanded upon using outside sources and contextualized to the operating environment (e.g. a policy result in Timor-Leste may have an outsized effect in that country, compared to the same policy in Indonesia).

Reporting OUs

Eight Asia EDGE OUs provided substantive reporting data. OUs did not indicate any major gaps, shortfalls, or concerns in the data for FY 2020, despite the COVID-19 pandemic. Where relevant, OUs provided forward-planning steps for how they will incorporate an Asia EDGE intended result (Goal, Outcome or CC Outcome) into FY 2021 activities. See Table 18 below for the list of OUs reporting FY 2020 results:

TABLE 18. OPERATING UNITS REPORTING FY 2020 RESULTS

OU	Results Narrative	Success Stories	Indicators
Bangladesh	✓	✓	--
India	✓	✓	✓
Indonesia	✓	✓	✓
Laos	✓	--	--
Nepal	✓	✓	✓
Pacific Islands	✓	--	--
Philippines	✓	--	--
RDMA	✓	--	✓
South Asia Regional	✓	--	✓

OU	Results Narrative	Success Stories	Indicators
Vietnam	✓	--	✓

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