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BUILDING LOW EMISSION ALTERNATIVES TO DEVELOP ECONOMIC RESILIENCE AND SUSTAINABILITY (B-LEADERS) PROJECT

TERMINAL REPORT

February 2014 – January 2019

January 2019

This document was produced for review by the United States Agency for International Development. It was prepared by RTI International.

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ACRONYMS

ACD	Asia Cooperation Dialogue
ACEF	Asia Clean Energy Forum
AGB	aboveground biomass
ALU	Agriculture and Land Use
AMRECO	Association of Mindanao Rural Electric Cooperatives, Inc.
APEC	Asia-Pacific Economic Cooperation
ARMM	Autonomous Region in Muslim Mindanao
ASEAN	Association of Southeast Asian Nations
AVP	audiovisual presentation
BGB	belowground biomass
BHS	barangay health station(s)
B-LEADERS	Building Low Emission Alternatives to Develop Economic Resilience and Sustainability Project
BOL	*Bangsamoro Organic Law*
BSEC	Bulacan Solar Energy Corporation
BSWM	Bureau of Soils and Water Management
BHS	barangay health station(s)
CAVCS	Carbon Accounting, Verification, and Certification System
CBA	cost-benefit analysis
CCC	Climate Change Commission
CCO	Climate Change Office
CDCS	Country Development Cooperation Strategy
CDI	Cities Development Initiative
CE	clean energy
CEO	chief executive officer
CFL	compact fluorescent lamps
CLEER	Clean Energy Emission Reduction Tool
COP21	21st Conference of Parties
CO_2e	carbon dioxide equivalent
COY	Conference of Youth
CPU	Central Philippine University
CREZ	Competitive Renewable Energy Zones
CRS	Catholic Relief Services
CSC	Carbon Sequestration Certificate

CSP	competitive selection process
CVF	Climate Vulnerable Forum
DA	Department of Agriculture
DALA	Damage and Loss Assessment
DAO	Department Administrative Order
DC	Department Circular
DENR	Department of Environment and Natural Resources
DILG	Department of the Interior and Local Government
DOD	Department of Defense
DOE	Department of Energy
DOTC	Department of Transportation and Communications
DOTr	Department of Transportation
DPWH	Department of Public Works and Highways
DQAs	data quality assessments
DRRMO	Disaster Risk Reduction Management Office
DU	distribution utility
EAMS	Energy Application Monitoring System
EC	electric cooperative
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
EE	energy efficiency
EG	Economic Growth
EICC	Energy Investment Coordinating Council
EMB	Environmental Management Bureau
ENRO	Environment and Natural Resources Office(r)
EO	Executive Order
EPIRA	*Electric Power Industry Reform Act*
ERC	Energy Regulatory Commission
ERP	Emergency Restoration Plan
EVOSS	Energy Virtual One-Stop Shop
FGD	focus group discussion(s)
FMB	Forest Management Bureau
FY	fiscal year
GAA	*General Appropriations Act*
GCC	Global Climate Change
GEOP	Green Energy Options Program
GHG	greenhouse gas
GIFT	Green Innovations for Tomorrow Corporation
GIS	geographic information systems
GPH	Government of the Philippines

GtG	Greening the Grid
ha	hectare(s)
HEPP	hydroelectric power plant
HPCo	Hawaiian-Philippine Company
HPS	high-pressure sodium
IDP	internally displaced person(s)
IEC	information, education, and communication
IG	Inspector General
INDC	Intended Nationally Determined Contribution
IPO	Investment Promotion Office
IPPU	industrial processes and product use
IRR	Implementing Rules and Regulations
ISIS	Islamic State of Iraq and Syria
JBLFMU	John B. Lacson Foundation Maritime University
JTB	Joint Technical Bulletin
kV	kilovolt(s)
kW	kilowatt(s)
kWp	kilowatt peak
LASURECO	Lanao del Sur Electric Cooperative
LCCAP	Local Climate Change Action Plan
LEAP	Long-range Energy Alternatives Planning
LED	low emission development
LEDS	Low Emission Development Strategies
LGU	local government unit
LLDA	Laguna Lake Development Authority
LOP	life of project
M&E	monitoring and evaluation
MBBC	Metro Batangas Business Club
Meralco	Manila Electric Company
MinDA	Mindanao Development Authority
MindanaoHealth	Integrated Maternal, Neonatal, Child Health and Nutrition, and Family Planning Regional Project in Mindanao
MOU	Memorandum of Understanding
MPMC	Mindanao Power Monitoring Committee
MSU	Mindanao State University
$mtCO_2e$	metric tons of carbon dioxide equivalent
MW	megawatt(s)
MWSS	Metropolitan Waterworks and Sewerage System
MYDev	Mindanao Youth for Development

NAMA	Nationally Appropriate Mitigation Action
NAMRIA	National Mapping and Resource Information Authority
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contribution
NEA	National Electrification Administration
NEDA	National Economic and Development Authority
NGA	national government agency
NGO	nongovernmental organization
NGP	National Greening Program
NIA	National Irrigation Administration
#NowASEAN	#Not on Our Watch ASEAN
#NowPH	#Not on Our Watch Philippines
NREB	National Renewable Energy Board
NREL	National Renewable Energy Laboratory
NWRB	National Water Resources Board
NYC	National Youth Commission
O&M	operations and maintenance
OIG	Office of Inspector General
OPE-P	Operation Pacific Eagle–Philippines
OSFMC	One-Stop Facilitation and Monitoring Center
OSG	Office of the Solicitor General
OSY	out-of-school youth
PAGASA	Philippine Atmospheric Geophysical and Astronomical Services Administration
PALECO	Palawan Electric Cooperative
PBE	Philippines Business for the Environment
PDP	Philippine Development Plan
PEP	Philippine Energy Plan
PFG	Partnership for Growth
PhilRECA	Philippine Rural Electric Cooperatives Association, Inc.
PhP	Philippine peso
PLLENRO	Philippine League of Local Environment and Natural Resources Officers, Inc.
PMP	Performance Monitoring Plan
PSA	power supply agreement
PV	photovoltaic
RA	*Republic Act*
RBOs	river basin organizations
RCP	Resiliency Compliance Plan
RE	renewable energy

REC	Renewable Energy Certificate
REM	Renewable Energy Market
REZ	renewable energy zone(s)
RFID	radio frequency identification
RPS	Renewable Portfolio Standard
SIARELCO	Siargao Electric Cooperative
SPW	strategic planning workshop
SWCCO	Systems-Wide Climate Change Office
TA	technical assistance
TAC	technical advisory committee
TCCCC	Tagbilaran City Climate Change Committee
TESDA	Technical Education and Skills Development Authority
ToT	training of trainers
TRWQMAGB	Tumaga River Water Quality Management Area Governing Board
TWG	technical working group
UEA	Urban Environmental Accords
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
UP	University of the Philippines
UPLB	University of the Philippines at Los Banos
USA	University of San Agustin
USAID	United States Agency for International Development
USD	United States dollars
U.S. EPA	United States Environmental Protection Agency
USPACOM	United States Pacific Command
VRA	vulnerability and risk assessment
VRE	variable renewable energy
W	watt(s)
WEFN	water-energy-food nexus
WESM	Wholesale Electricity Spot Market
YPF	YesPinoy Foundation
ZCAGB	Zamboanga City Airshed Governing Board

EXECUTIVE SUMMARY

The **Building Low Emission Alternatives to Develop Economic Resilience and Sustainability (B-LEADERS)** Project was a 5-year project of the United States Agency for International Development (USAID)/Philippines. B-LEADERS was implemented to support the Government of the Philippines (GPH) and its key partners in planning, designing, and implementing Low Emission Development Strategies (LEDS) contributing to the formulation of Nationally Appropriate Mitigation Actions (NAMAs)[1] in the power, transport, and land use sectors. During its project life, B-LEADERS accomplished its two major tasks: 1) to strengthen in-country capacity on low emission development (LED) and 2) to increase investments into clean energy (CE).

In its last year (February 1, 2018, to January 31, 2019), B-LEADERS provided support in the aftermath of the 2017 conflict in Marawi City. Rapid technical assistance (TA) was needed to help rebuild the city after the 5-month siege involving the extremist Islamic State of Iraq and Syria (ISIS)-inspired Maute Group. B-LEADERS mobilized support for the rehabilitation of Marawi in coordination with other USAID projects such as Integrated Maternal, Neonatal, Child Health and Nutrition, and Family Planning Regional Project in Mindanao (MindanaoHealth); Support to People Displaced by the Marawi Conflict – Early Recovery Implementation, which is implemented by the Catholic Relief Services (CRS); and Mindanao Youth for Development (MYDev). B-LEADERS was also involved in the customization of hydrological resource analysis modeling tools for the context of the water-energy-food nexus (WEFN), assisting the National Water Resources Board (NWRB) and other relevant agencies in developing the National Water Security Roadmap. The models have generated water resource maps to support the development of a common or integrative platform that links river basin and economic development plans, particularly in Mindanao, with Mindanao Development Authority (MinDA) in the lead. This period likewise saw the congressional bicameral conference committee approval of the landmark *Energy Virtual One-Stop Shop (EVOSS) Act*[2] after years of B-LEADERS's support to the Philippine Department of Energy (DOE). The *EVOSS Act* aims to expedite processes that are aimed at increasing the country's energy supply. The Philippine Congress underscored the national importance and urgency of the *EVOSS Act* by allocating an initial budget of 100 million Philippine pesos (PhP), or 1.883 million United States dollars (USD), for this purpose.

B-LEADERS successfully met all eight of the new performance indicators used to measure the success of the project's last year. As part of USAID's quick response to the armed conflict in Marawi City, B-LEADERS contributed to the rehabilitation of the city, particularly by supporting

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1. NAMAs comprise a set of policies and actions that countries undertake as part of a commitment to reduce GHG emissions. The term recognizes that different countries may take different nationally appropriate action on the basis of equity and in accordance with common but differentiated responsibilities and respective capabilities. It also emphasizes the role of financial assistance provided by developed countries to developing countries to reduce emissions.

2. On December 10, 2018, the Senate Committee on Energy and the House Committee on Energy agreed to adopt the Senate Bill No. 1439, *The Energy Virtual One-Stop Shop Act of 2017,* as the base of the reconciled bill.

internally displaced persons (IDPs) and enhancing the resilience of the city's power sector. Power was immediately restored after installing or handing over 155 additional units of solar photovoltaic (PV) streetlights along the thoroughfares and in four temporary shelters for IDPs. In addition, solar PV rooftops were installed in four barangay[3] health stations (BHS) in Marawi City. In total, the TA helped add 14 kilowatts (kW) of CE capacity. The effort drove a reduction in greenhouse gas (GHG) emissions of 392.63 metric tons of carbon dioxide equivalent ($mtCO_2e$) from displacing grid electricity with solar energy, and 131.20 $mtCO_2e$ from using more energy-efficient light-emitting diode bulbs instead of high-pressure sodium (HPS) as baseline technology. The basic electricity systems established in selected communities in Marawi City have been validated to benefit 7,947 IDPs daily, 200 passing vehicles per night in Barangay Sagonsongan, and 22,800 BHS staff and visitors annually.

B-LEADERS also successfully achieved the two major tasks of capacity building and CE investments that resulted in the reduction, sequestration, or avoidance of GHG emissions amounting to 563,648 $mtCO_2e$, an increase in power generation sourced from CE equivalent to 242 megawatts (MW) of capacity, and the mobilization of investments in CE projects and activities valued at USD 579 million. These are the project's apex indicators, and the results exceeded the targets set for each indicator, reaching accomplishment levels of 156 percent, 107 percent, and 227 percent, respectively. All other project indicators have been surpassed as presented in the succeeding section on indicators.

The CE projects mentored by B-LEADERS during its base period have continued to operate and produce electricity even as the project's last year came to a close. As of January 31, 2019, the base period's CE projects and the solar PV installations in Marawi enabled B-LEADERS to cumulatively reduce or avoid a total of 1,046,195.51 $mtCO_2e$ GHG emissions due to an aggregated increase in power generation sourced from CE equivalent to 242.0785 MW of capacity within the entire life of the project. By 2030, these projects could cumulatively contribute to a total GHG reduction of at least 6 million $mtCO_2e$.

B-LEADERS exceeded its respective targets during its project life by employing appropriately diverse and broad-based implementation strategies and approaches. First, the project focused on building lasting working relationships with its institutional partners through sustained capacity building and joint activity implementation. The strong partnerships proved vital to the success and sustainability of various project initiatives. ***Figure 1*** illustrates 5 years of partnerships and initiatives under B-LEADERS.

[3] A barangay is the smallest administrative division in the Philippines. "Barangay" is the local term for a village or ward.

Figure 1. B-LEADERS milestones of partnerships and initiatives

Second, the project emphasized the use of effective analytics and tools in the implementation of its plans. This approach increased partner confidence and concretely demonstrated the feasibility and practicality of mitigation actions. Third, B-LEADERS recognized that mitigation action straddles many ecosystems, from ridge to reef, and as such it operated in different biophysical spheres. The project took into account the nexus of water, energy, and food, and took on activities that address the impact of natural and human-induced disasters in strengthening energy resilience. Fourth, the project worked from the local level (local government units) to the national (national government agencies) and global levels, to engage advocacies at all levels to help pursue and intensify action on climate change mitigation. Finally, B-LEADERS used to full effect the power of communications and multimedia venues in building consensus, mobilizing support, and catalyzing action.

Strengthening Institutional Partnerships. During its 5-year implementation, B-LEADERS became an established and trusted partner of various government agencies, local government units (LGUs), and private sector organizations. The project has been regularly invited to help facilitate and provide input in the internal and multistakeholder planning and assessment sessions of DOE, MinDA, the Energy Regulatory Commission (ERC), the Climate Change Commission (CCC), the National Renewable Energy Board (NREB), and the Philippine League of Local Environment and Natural Resources Officers, Inc. (PLLENRO).

The widespread destruction of Marawi has worsened the already weak electricity distribution network of the Lanao del Sur Electric Cooperative (LASURECO), the sole distributor of electricity for the Province of Lanao del Sur where the city is located. B-LEADERS's quick response in support of Task Force Bangon Marawi consisted of interrelated activities leading to the rapid deployment of resilient energy systems. As the project installed solar PV streetlights and rooftops and helped LASURECO develop resiliency plans, project staff worked closely with MinDA, DOE, and communities and community leaders to ensure the relevance and sustainability of the support provided. To maximize impact of the U.S. Government's TA, B-LEADERS strengthened partnerships with other USAID-supported projects such as MYDev, MindanaoHealth, and CRS, which expanded institutional partnerships in Mindanao particularly to those involved in the rebuilding of Marawi City and its environs. B-LEADERS provided the energy, water, food, and resiliency lens for the initiatives.

B-LEADERS provided support in institutional coordination, data sharing, and capacity building on upscaling WEFN initiatives. Cutting across various thematic areas, the nexus study and policy discussions involved stakeholders such as NWRB, MinDA, various national government agencies (NGAs), the private sector, and an LGU. These groups are currently working together to finalize the Philippine Water Security Roadmap.

When the Philippine government decided to submit its Intended Nationally Determined Contribution (INDC) to reduce GHG emissions, B-LEADERS was asked to provide technical expertise in developing customized cost-benefit analysis (CBA) tools for evidence-based, quantifiable, and verifiable methodology in developing priority mitigation actions for the Philippines. A series of consultations was conducted to validate parameters, inputs, and assumptions to the country's quantitative information base, and the results laid the foundation upon which the

Philippines based its INDC. The Philippines submitted its INDC to the United Nations Framework Convention on Climate Change (UNFCCC) on October 1, 2015. An enhanced CBA was subsequently requested by the government to revisit the INDC as the country transitions to a Nationally Determined Contribution (NDC). The new integrated results, including the updated sectoral CBA tools and worksheets, have already been made available to the government to help with policy making.

B-LEADERS supported CCC, DOE, and other agencies in preparing a National Energy Policy Review, which adopts a whole-of-nation vision of long-term decarbonization of the energy sector in line with the NDC. Under new stewardship, DOE asked that B-LEADERS review the fuel mix policy, the state of the power sector's reserve requirement, and future energy demand in light of the current administration's emphasis on growth of the manufacturing sector. DOE also requested a revalidation of the assumptions and the calculations underlying the updated Philippine Energy Plan (PEP).

B-LEADERS also carried out nationwide renewable energy (RE) resource assessments to provide information to RE investors, developers, and government agencies on the sites where the most RE resources are available. B-LEADERS provided on-the-ground support to the U.S. National Renewable Energy Laboratory (NREL) in the development of a Geospatial Toolkit, which featured an online and map-based software application that integrates resource data and other geographic information systems (GIS) data for integrated resource assessment. The toolkit includes the wind prospector, which facilitates assessment of more economically viable wind potential that is closer to loads and infrastructure. B-LEADERS also provided in-country support to NREL in helping the energy sector with its Greening the Grid (GtG) initiative and the Philippine Competitive Renewable Energy Zones (CREZ) process.

At the local level, B-LEADERS worked with CCC and its partner LGUs in customizing spreadsheets and instructional manuals for community- and entity-level GHG Inventory and Accounting. These tools provide step-by-step guidance in gathering, managing, and quantifying data and information about the level of GHG emissions and removals within respective jurisdictions. The *User's Manual on LGU GHG Inventory* was officially launched by USAID and CCC in March 2016 for use nationwide. In addition to guiding its partner LGUs in estimating emissions, B-LEADERS provided assistance to LGUs in identifying ways to avoid, reduce, or sequester GHG emissions in an effective and timely manner. This effort resulted in the development and subsequent implementation of GHG Management Plans. CCC, PLLENRO, and the Department of the Interior and Local Government (DILG) recognized the need to improve the guidebooks on how to develop Local Climate Change Action Plans (LCCAPs), and asked B-LEADERS to provide technical input on the LEDS components.

Through USAID's Cities Development Initiative (CDI), secondary and tertiary cities like Zamboanga, Tagbilaran, Cagayan de Oro, Batangas, and Iloilo City received support for preparing their entity- and community-level GHG inventories and in pursuing local climate change actions. The results included investments and implementation of mitigation initiatives such as the Green Building Code in Mandaue City, the rooftop solar projects in Iloilo City, and various energy efficiency (EE) initiatives in the cities, to name a few.

Building Human Resource and Institutional Capacity. As part of its vital partnership building, B-LEADERS organized and sustained various trainings, workshops, and consultations that directly strengthened the capacity of a number of government agencies. Throughout the life of the project, B-LEADERS supported a series of trainings to strengthen the technical competence of the technical and legal staff of ERC. The project trained the Office of the Solicitor General (OSG), MinDA's One-Stop Facilitation and Monitoring Center (OSFMC), and Mindanao Power Monitoring Committee (MPMC) personnel on power sector and climate change issues. These efforts also helped strengthen the capacities of CCC, DOE, and the Department of Transportation (DOTr) in identifying and prioritizing options to reduce per-unit emissions from stationary (power) and mobile (transportation) energy use. At the local level, LGUs and private sector partners were given trainings on techno-financial assessments and actual implementation of RE and EE measures.

To help ensure sustainability after its work in Marawi rehabilitation, B-LEADERS helped build local capacities in establishment and operations and maintenance (O&M) of solar PV systems. Technical personnel from LASURECO were trained alongside new Marawi-based local solar technicians. In partnership with USAID MYDev, further human resource initiatives were provided by developing the skills of out-of-school youth (OSY) from Marawi and its neighboring towns; these youth have earned certificates for completion of the Electrical Installation and Electronic Products Assembly course under the Technical Education and Skills Development Authority's (TESDA) National Certification II Program.

Enabling Energy Sector Governance. Building on previous USAID support to MinDA's OSFMC, the project provided comprehensive and sustained support to the development of DOE's EVOSS, which contributed to energy sector reform by promoting ease, transparency, and accountability of doing business in the energy sector. During the project's last year, the national importance of EVOSS was further underscored when the Philippine Senate and the House of Representatives approved the *EVOSS Act* as Senate Bill No. 1439 on November 22, 2017, and as House Bill 8417 on November 22, 2018. A Bicameral Conference Committee held on December 6, 2018, resulted in the increase in initial appropriation for EVOSS from PhP 50 million to PhP 100 million. Sustained government support is assured as the act stipulates that subsequent funds for EVOSS be included in the annual *General Appropriations Act* (*GAA*) of the government. It was estimated that the ease of doing business through EVOSS could result in savings of at least USD 45 per Filipino household every year.

The project provided technical inputs to a draft bill aimed at achieving a long-lasting peace and autonomy in the Bangsamoro ("Moro people") region in parts of Mindanao. This landmark bill was later enacted on July 26, 2018, as *Republic Act* (*RA*) *11054*, otherwise known as the *Bangsamoro Organic Law* (*BOL*). Through the Senate Committee on Energy, B-LEADERS provided comments on the proposed amendments on the *BOL*'s energy and natural resource provisions. Specifically, the project's comments were directed to resolution of energy-related issues between the Bangsamoro government and the central Philippine government, and on the importance of upstream-area governments recognizing the rights of downstream-area governments in cases where river basins flow across different governmental units. B-LEADERS also provided a summary on the potential impact of the final version of the *BOL* on the water and power sectors in Mindanao.

B-LEADERS supported DOE, NREB, ERC, and electric power industry organizations and participants in developing mechanisms and supplemental rules supporting the sustained implementation of the *Electric Power Industry Reform Act* (*EPIRA*) and the *RE Act of 2008*. The project provided technical advice and support to public consultations on developing, among others, the On- and Off-Grid Renewable Portfolio Standard (RPS); Green Energy Options Program (GEOP); Renewable Energy Market (REM); Philippine CREZ Process; GtG Initiative; Smart Grid Technology; various ERC rules that aim to eliminate energy market abuse; inputs to support creation of the Energy Investment Coordinating Council (EICC); and streamlining the procedures for energy service/operating contract applications.

Linking Energy to Environmental and Social Benefits. B-LEADERS consistently ensured that all its activities reflected its higher-level objectives and contributed to the development goals of both the U.S. Government and GPH. The project focused on benefits that linked to both environmental and social considerations. The project supported ERC in its mandate to "promote and protect long-term consumer interests in terms of quality, reliability, and reasonable pricing of a sustainable supply of electricity." B-LEADERS provided assistance to ERC in building capacity to review bilateral power supply agreements (PSAs), rules governing the issuance of licenses/authorization to retail electricity suppliers, rules for contestability, and implementing guidelines for the competitive selection process (CSP) in procuring power supplies by distribution utilities (DUs) for their captive market. The project also assisted the MPMC Secretariat and MinDA staff in understanding the practical aspects of the Wholesale Electricity Spot Market (WESM) of Mindanao, which will serve as a venue for trading electricity as a commodity and seeks to achieve a more reliable and affordable electricity supply over the long term. Project support to MinDA also improved the ability of key personnel to identify strategies for potential use of power from the Agus-Pulangui Hydroelectric Complex for Mindanao Economic Zones and the marginalized sector.

Through DOE, B-LEADERS also conducted an institutional analysis of the energy permitting procedures of DOE as an input to EVOSS work. The analysis considered the roles of various agencies that deal with environmental and social concerns, such as the Department of Environment and Natural Resources (DENR) and the National Commission on Indigenous Peoples.

At the local level, the project continued to support analysis of the interrelation of economic, environmental, and social activities to guide local government planning and policy formulation. For example, B-LEADERS supported Iloilo City, through its City Environment and Natural Resources Office (ENRO), in establishing the Charcoal Value Chain to assess the effect of household charcoal demand on land-based forests and mangroves. Charcoal is a significant source of energy for households and commercial establishments in the city, and the analysis of the fuel's production, transport, and trading along the value chain considers social and economic implications.

The project also supported Iloilo in estimating the remaining biomass stock and the corresponding carbon sequestration potential of coastal and river mangroves in the city. The results provided the baseline for the city government in its effort to protect and increase mangrove forest cover to ensure sustainability of this valuable natural resource.

Mainstreaming Energy Resilience and Smarter Power Systems. B-LEADERS supported DOE and the National Electrification Administration (NEA) in conducting a study, Development of

Climate-Resilient Distribution Construction Standards, to review the performance of existing distribution line standards in high wind conditions. The recommended standards were officially proposed to NEA as an added chapter in the existing distribution network building code to address climate resilience specifically for DUs and electric cooperatives (ECs) that are severely impacted by extreme weather patterns.

In Mindanao, B-LEADERS supported MinDA with the Mindanao Water-Energy Nexus Study. The study aimed to 1) provide a basis for considering hydropower as a mitigation action in the energy sector and 2) determine how the changing climate could impact Mindanao Island's future water and energy supply. The study analyzed the impacts of climate projections and other parameters on the region's hydroelectric power generation, specifically in the Agus-Ranao River Basin. The initiative has been carried forward to support NWRB in developing the National Water Security Roadmap and in looking at WEFN initiatives. Hydrological resource analysis models were customized for generating water resource maps to support the development of a common or integrative platform that will link the river basin and economic development plans.

B-LEADERS also provided technical input in developing smart grid systems. In 2017, a joint team of technical experts from DOE, the U.S. Government, and the DUs successfully installed smart resiliency and monitoring equipment for Bohol Light Company, Incorporated, and Palawan Electric Cooperative (PALECO), respectively. U.S. Government engineers were engaged under the U.S. Pacific Command (USPACOM), and USPACOM's Unified Cause: Enhancing Contextual Awareness Program was complemented by B-LEADERS and brought in the two pilot DUs as partners. This collaboration aims to better understand load variations and improve operations with regard to stability, which will serve as the foundation for a resilience roadmap for the Philippines.

In 2015, energy ministers from 21 member economies signed the Asia-Pacific Economic Cooperation's (APEC) Cebu Ministerial Declaration, which provided clear policy direction on how the region should address climate change concerns. The declaration covered an array of policy thrusts such as climate-proofing energy infrastructure, adoption of advanced EE technologies, promoting CE in poverty-stricken areas, and improving energy trade and investment. B-LEADERS supported the development of a framework and subsequent drafting of the Guidelines to Develop Energy Resilience in APEC Off-grid Communities. The guidelines provide practical approaches and references to building energy resilience in marginalized areas and, notably, included gender considerations in its guideline, The Role of Women in Energy Resilience, in the final report.

The work on energy resilience policy and guidelines also led to the implementation of projects that demonstrated energy resilience. B-LEADERS provided assistance in the development of the 25.5- kW power system in Green Island, Palawan, which was considered the country's pioneer facility for a full RE hybrid system composed of solar, wind, and biomass components. The project also extended support to Isla Verde in Batangas City, where it helped establish the island's first solar-powered micro-grid system in partnership with Batangas City, Sunpower Philippines, and franchise holder Manila Electric Company (Meralco). The pilot project will bring initial capacity of at least 196 kW of solar power.

Promoting Private Sector Participation. During its base period, B-LEADERS supported and mentored "new entrant" RE companies to help them complete their respective projects. Project

support included technical input to prefeasibility and feasibility studies, navigation through the nuances of project development permitting, securing agreements with various government agencies, monitoring of construction, and facility commissioning. As stated above, accumulated capacity achieved has reached more than 242 MW, with the total amount of investments valued at more than USD 579 million.

B-LEADERS also supported DENR in developing a domestic policy for incentivizing and recognizing private sector investments in forestry projects. This work aims to provide opportunities for businesses to acquire domestically recognized Carbon Sequestration Certificates (CSCs) through a Carbon Accounting, Verification, and Certification System (CAVCS). At the local level, various companies that have participated in the project's GHG management and EE capacity-building measures have already invested in CE projects such as John B. Lacson Foundation Maritime University (JBLFMU) and Robinson's Mall in Iloilo City.

Maximizing Communications for Action. During the past 5 years, B-LEADERS successfully produced visually compelling, informative, and interactive communications and outreach materials targeting a wide range of audiences, including national and local governments, private sector, media, youth, and the general public. To convey specific information to its intended participants, B-LEADERS used various channels in both traditional media format and cutting-edge technologies to effectively demonstrate, inform, train, and communicate its goals and objectives to various stakeholders. This strategy proved to be effective in popularizing the highly technical nature of climate change to a broad range of stakeholders and audiences.

For example, B-LEADERS provided support to the #Not on Our Watch Philippines (#NowPH) campaign, an advocacy organized by CCC and supported by the National Youth Commission (NYC), YesPinoy Foundation (YPF), and United Nations Children's Fund (UNICEF). The #NowPH campaign aimed to empower youth in the call to support the 21st Conference of Parties (COP21) of UNFCCC in Paris, France, in 2015. The role of the nation's youth was subsequently recognized through the 2015 Philippine Proclamation No. 1160 declaring November 25 of every year as National Day for Youth in Climate Action. B-LEADERS continued to support the campaign and, during the 33rd Summit of the Association of Southeast Asian Nations (ASEAN) last November 13, 2018, ASEAN also declared November 25 as ASEAN Youth in Climate Action and Disaster Resilience Day.

Implementation Challenges. B-LEADERS exceeded all its set targets; nevertheless, it faced an ample share of challenges and difficulties. B-LEADERS experienced significant challenges that tested its relevance and integrity. At the forefront of these challenges were the political changes that resulted in sudden shifts in policy direction, specifically in the CE sector. Both the U.S. Government and GPH expressed reservations about the Paris Agreement, practically putting on hold a number of key climate change initiatives. Because B-LEADERS was designed as a climate change mitigation activity, these reservations provided challenges to the project's work. The Philippine national election year 2016, in particular, was marked by serious disruptions in the work flow of key government partners—leadership at the CCC turned over twice in 2017 alone. Other principal government partners, such as DOE, also experienced substantial leadership changes.

The siege of Marawi City by ISIS-inspired Maute terrorists was another key challenge that affected the project. The months-long battle in the city and the ensuing martial law in Mindanao constrained the project's activities in the region. The multiplicity of activities in the climate change and CE space also posed a substantial problem. Given the overlapping interests not only with other donor agencies but also with USAID-funded projects, B-LEADERS was compelled to secure high-value, high-impact activities such as the CBA study for the Philippines' NDC, the Water-Energy-Nexus Study, the *LGU GHG Inventory Guidance Manual*, and the mitigation component of LCCAP, to name a few. The participation of multiple donor partners required intensive coordination, networking, and diplomacy.

B-LEADERS's work in Marawi during the last year also considered the continuing effect of martial law in Mindanao, as well as other travel and security advisories in the area.

Finally, a significant challenge emerged when funding for mitigation projects was pulled back from traditional USAID sources. USAID was compelled to examine its existing funds to find support for the project. As a result, B-LEADERS had multiple funding mechanisms during its life cycle. The various funding sources had distinctly different performance indicators, necessitating rapid assessment of potential activities, and requiring due diligence to ensure compliance with the major terms and conditions of contractual agreements with USAID. Tracking and reporting the respective use of funds also proved to be a tedious, albeit necessary, task.

SECTION 1: BACKGROUND

B-LEADERS was a multiyear year USAID/Philippines project with a base period of 4 years (2014–2018) and an option year (2019). B-LEADERS contributes to the economic growth objective and environment program area of the U.S. Foreign Assistance Framework. The project builds upon the successes and momentum of USAID's Climate Change and Clean Energy Project that was implemented from 2010 through 2014. The main objective of B-LEADERS is to strengthen cooperation with GPH and its key partners to plan, design, and implement LEDS in support of the joint U.S. Government–GPH LEDS work plan. The project was also designed to support Philippines' climate change programs and green growth strategies toward the development of NAMAs. The project focused on enhancing the capacities of the CCC, DOE, and LGUs for LEDS analysis and implementation. Where relevant and feasible, B-LEADERS pursued specific partnerships with DENR, Department of Transportation and Communications (DOTC),[4] key academic institutions, and private sector organizations. Partnerships with CE project developers and private financing institutions were likewise strengthened. Specifically, the project was expected to achieve the results summarized below and illustrated in ***Figure 2***.

The first expected result—*in-country capacity on low emission development is enhanced*—was considered attained upon the preparation of a revised national GHG Inventory, improved national data on emissions, and strengthened capacity of GPH on LEDS, with emphasis on the formulation of NAMAs for the Philippines. The second expected result—*investment into clean energy projects is increased*—was measured in terms of total USD value of investments channeled into CE projects and the total MW of capacity added or saved. Both high-level results were expected to contribute to the reduction of GHG emissions and, in the long run, to the improvement of the Philippines' air quality, economic efficiency, and climate resilience.

B-LEADERS worked toward its goals with sustained analyses and assessment of the country's energy sector and energy security targets, and with considerable focus on determining priority mitigation actions, increasing efficiency, building capacity, and identifying priority sites for the country's energy sector. In parallel with defining the energy sector's status and targets, the project also continued to assess the state and outlook of CE investments in the country, and focused specifically on recent experiences of both government and private financing institutions in CE investments.

[4] In May 2016, the *Republic Act 10844* effectively split DOTC into the Department of Information and Communications Technology and the Department of Transportation (DOTr).

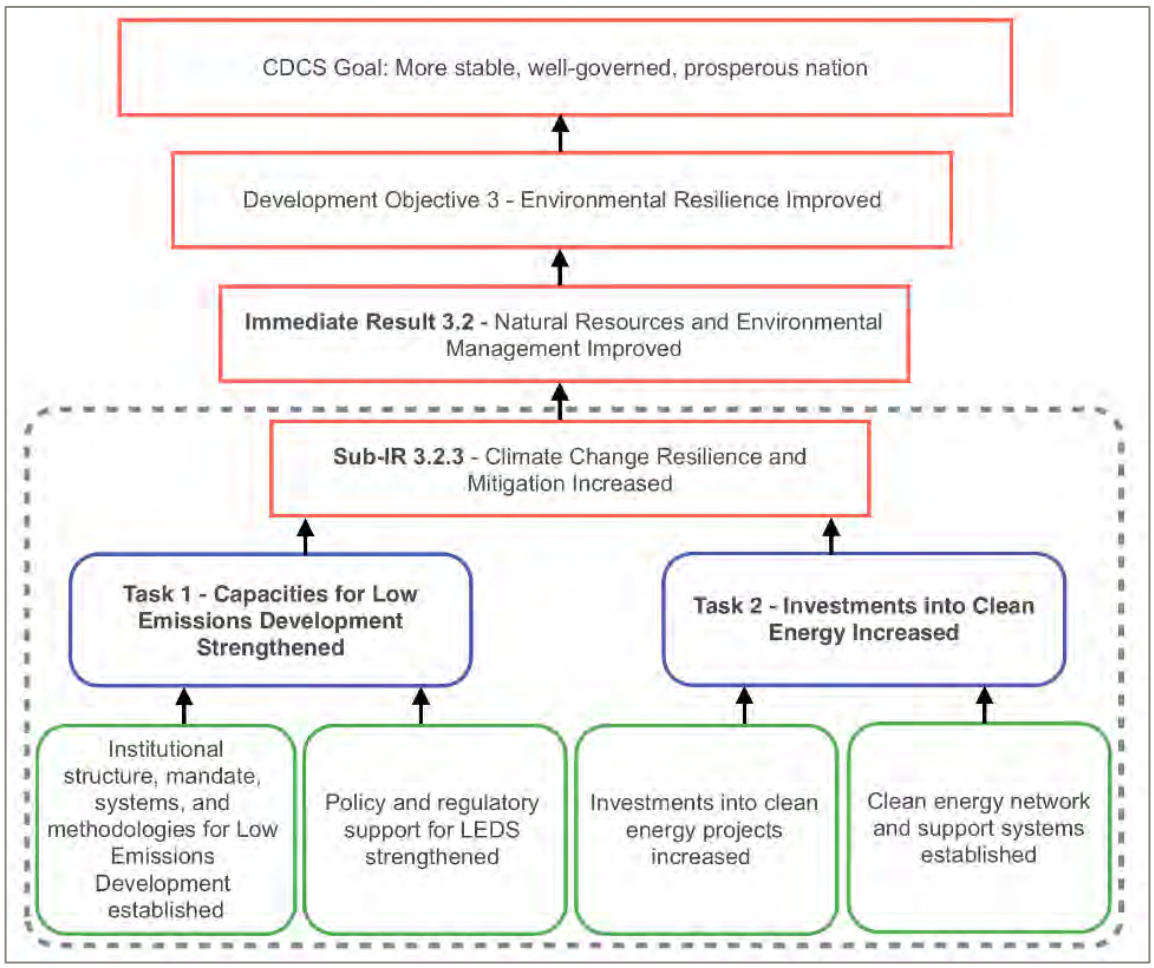


Figure 2. B-LEADERS logic framework in relation to the Country Development Cooperation Strategy (CDCS)

In B-LEADERS's fourth year of implementation, USAID deemed it necessary to exercise the option period pursuant to Section I.2 and I.3 of the Task Order. This sustained USAID's support to GPH and ensured continuation of critical developments in the energy sector, which were largely driven by GPH initiatives to facilitate a private-sector-friendly investment climate through passage of a bill and issuance of Executive Order (EO) 30: Creating the EICC in Order to Streamline the Regulatory Procedures Affecting Energy Projects, as well as the expected promulgation of the various mechanisms supporting a significant shift toward CE led by NREB.

However, in response to the armed conflict in Marawi City from May to October 2018 involving ISIS, USAID shifted the focus of its TA during the remaining life of B-LEADERS. The conflict created an urgent need to rebuild the power sector of the city, anchored on a government-led energy resiliency policy. USAID has a long history of TA partnership with DOE that supports GPH's long-term vision of building enhanced resilience in energy systems, especially in areas of the country considered most vulnerable to both human-induced and natural disasters. Most of the project's

activities during its last year were geared toward rapid response to the crisis in close collaboration with DOE, MinDA, and LASURECO.

The siege had a major impact on the power sector in the city, crippling the operations of LASURECO, which suffered great losses including damage to infrastructure and other power facilities vital for operations. LASURECO's already weak distribution network was left in even worse condition. Years of infrastructure rebuilding, governance reform, and finance restructuring will likely be needed to restore LASURECO to a state of full viability and reliability. Earlier rehabilitation efforts undertaken through the Inter-Agency Task Force on Securing Energy Facilities restored services to some facilities and institutions such as the Provincial Capitol, Amai Pakpak Medical Hospital, city hall, military camps, Mindanao State University (MSU), and some streetlights in certain communities.

To further accelerate the rehabilitation, power restoration, and guidance on prudent investment of government resources in Marawi City, B-LEADERS sustained and enhanced its support to directly assist GPH through various and interrelated rebuilding activities, including the following:

- Installing additional communal lighting facilities in Marawi City and other resettlement areas identified with DOE and LASURECO,
- Conducting a full assessment of the extent of damage to the power infrastructure,
- Performing an inventory of equipment and supplies needed for power restoration,
- Implementing surveys to recover and validate customer data necessary to reconstruct LASURECO's customer database,
- Formulating a set of recommendations for the restoration and improvement of Marawi City's electrical services,
- Developing a plan to increase the resilience of electrical facilities against natural and human-induced hazards,
- Assisting in developing an action plan designed to mobilize government and private funds to restore electricity services, and
- Installing rooftop solar PV systems for BHS in Marawi City.

On January 17, 2018, DOE issued Department Circular (DC) 2018-01-0001: Adoption of Energy Resiliency in the Planning and Programming of the Energy Sector to Mitigate Potential Impacts of Disasters. The primary objective of this DC is to institutionalize the development, promotion, and implementation of a Resiliency Compliance Plan (RCP) to strengthen the capacity, safety, culture, and disaster preparedness and response capability of the energy sector. Meanwhile, the first phase of the conceptual study on efficient resource allocation was initiated as a result of the review of the relevant sectors of the National Climate Change Action Plan (NCCAP) and the output of the water-energy-nexus case study in Mindanao, which was undertaken in partnership with NWRB and MinDA. To support the energy resiliency policy and the policy study on the interaction among the three vital sectors of water, energy, and land use, B-LEADERS conducted the following activities:

- Assisted LASURECO in conceptualizing and developing its RCP so that it will comply with DC 2018-01-0001; and
- Undertook a conceptual study on efficient resource allocation that accounts for the interaction of water, energy, and land resources in Mindanao.

The Duterte Administration has been aggressively pursuing an ambitious infrastructure spending program to spur regional economic development. The robust picture envisioned for the country's growth will require a substantial increase in the available power supply. Given the protracted process of approvals in the energy sector, EO 30 was issued in June 2017 to accelerate the construction of new power generation facilities. The order also established EICC, chaired by DOE, to streamline the regulatory process for energy investments. EICC members come from various government agencies involved in the permitting process for energy projects. B-LEADERS provided technical advice in finalizing the Implementing Rules and Regulations (IRR) of the EO, including public consultations, as well as continued support to EVOSS.

SECTION 2: INDICATORS

This report covers February 1, 2014, to January 31, 2019, encompassing the option and base periods of B-LEADERS. The report describes the accomplishments of the project to achieve foreign assistance goals under USAID's current Country Development Cooperation Strategy (CDCS) Development Objective 3: Environmental Resilience Improved. The project's objectives are specifically under the Intermediate Result: Increasing climate change resilience and mitigation, with focus on the two main tasks of strengthening capacity for LED and increasing investments in CE.

A. OPTION PERIOD INDICATORS

For B-LEADERS's last year covering February 1, 2018, to January 31, 2019, targets for eight new performance indicators were identified under the project's new Performance Monitoring Plan (PMP). Except for the custom indicator, the Monitoring and Evaluation (M&E) Plan adhered to the Economic Growth (EG) indicators based on the *2016 Global Climate Change (GCC) Standard Indicator Handbook*. Performance data are verifiable using periodic data quality assessments (DQAs). These data are properly documented and stored both in electronic and paper format, and meet the standards of validity, integrity, precision, reliability, and timeliness. Data source records are maintained in the B-LEADERS database and in the project's performance indicator tracking table.

By January 31, 2019, the project has already achieved all its final year's targets. *EG 11-6*, the number of people using climate information to improve resilience to climate change, was at 239 percent achieved, and the cumulative result for *EG 12-1*, the number of people trained in CE, is at 293 percent of its option year target. The number of institutions capacitated on climate change issues (*EG 12-2*) is currently at 228 percent and 100 percent achieved on the number of policies, strategies, or plans adopted or implemented (*EG 12-3*).

Of 155 additional units of solar streetlights—wherein 147 are already operating in and adjacent to four temporary shelters for IDPs, including one at the CRS resettlement site—8 remaining units were donated to CRS. Including the 4 solar PV rooftops installed at BHS facilities in Marawi City, the number of basic electricity systems established in selected communities (*Custom Indicator*) reached 159 percent of the option year target. The corresponding number of beneficiaries with improved energy services (*EG 7.1-1*) achieved 159 percent of the option year target if only the 7,947 IDPs who currently reside at the shelters are considered. An average of 200 motorists nightly were verified to have benefited from the streetlights in Barangay Sagonsongan as they pass through the lighted thoroughfares. In addition, about 22,800 people, comprising BHS staff and visitors, benefit from the solar-powered health facilities over a period of 1 year.

The remaining indicator with target, which corresponds to the equivalent GHG emission reduction (*EG 12-6*), currently stands at 1,048 percent based on the aggregated impact of RE's displacement of grid electricity and the EE initiative of using light-emitting diode bulbs instead of HPS as baseline

technology; in total, the impact is 523.83 $mtCO_2e$. If projected through 2030, the cumulative impact would be 5,576.50 $mtCO_2e$ of mitigated emissions.

The following discussions provide details on option year accomplishments of B-LEADERS.

Indicator 1 – Number of basic electricity systems established in selected communities (Custom Indicator)

A total of 155 additional units of solar streetlights, with combined panel capacity of 7.995 kW, were installed and/or donated during the option year. Of the 155 streetlights, 147 are already operating while 8 units have been donated to CRS. Specifically, these electricity systems were provided in or adjacent to four IDP resettlement sites:

1. Sagonsongan temporary shelter – 98 units,
2. Sarimanok 1 shelter camp – 10 units,
3. Sarimanok 2 shelter camp – 17 units, and
4. CRS resettlement site – 30 units.

In addition, four 1.5-kW solar PV rooftop panels were installed and are currently operating in the facilities of four selected BHS: Olowa Ambolong, Sugod, Tuca, and Basak Malutlut. These 159 solar technology installations represent 159 percent of the option year target.

Indicator 2 – Number of beneficiaries with improved energy services due to U.S. Government assistance (EG 7.1-1)

Within the option year, it was verified that 7,947 IDPs who reside at the four temporary shelter camps directly benefit from the solar streetlights on a daily basis. This alone already represents 159 percent of the option year target. This figure does not yet account for the number of motorists benefiting as they pass through the lighted thoroughfares, which was verified to be about 200 vehicles per night. Furthermore, an estimated 22,800 people per year, comprising BHS staff and visitors, benefit from the solar-powered health facilities.

Indicator 3 – Number of people using climate information or implementing risk-reducing actions to improve resilience to climate change as supported by U.S. Government assistance (EG 11-6)

About 239 individuals used climate information or implemented risk-reducing actions to improve climate resilience. Training workshops were given in the field of hydrological resource analysis modeling and vulnerability and risk assessment (VRA) and resiliency planning. The total thus far represents 239 percent of the option year target.

Indicator 4 – GHG emissions, estimated in metric tons of carbon dioxide equivalent ($mtCO_2e$), reduced, sequestered, and/or avoided as a result of U.S. Government assistance (EG 12-6)

For the period covering the start of the option year, February 1, 2018, through January 1, 2019, the project was able to reduce, sequester, or avoid 187.09 $mtCO_2e$ GHG emissions due to the operation of the solar streetlights plus 205.54 $mtCO_2e$ due to the operation of the solar BHS rooftops installed

in Marawi City. This figure, totaling 392.63 $mtCO_2e$, was based on the displacement of grid electricity with solar RE; it does not yet include 131.20 $mtCO_2e$ reduction due to the EE initiative of using light-emitting diode bulbs rather than HPS lamps as baseline technology. The total GHG reduction of 523.83 $mtCO_2e$, which represents 1,048 percent of the target set for the option year, equals removing about 112 gasoline-powered cars from the road for 1 year or growing about 13,576 tree seedlings for 10 years.

The estimate of GHG emissions avoided or reduced was based on the capacity of operational RE projects that were completed under Indicator 6. The most recent version of the USAID Clean Energy Emission Reduction (CLEER) Tool was used for this purpose, whereas the translated GHG equivalencies were estimated using U.S. Environmental Protection Agency's (U.S. EPA) online GHG Equivalencies Calculator. B-LEADERS fully documented the tools, methods, data inputs, and data sources used. Supporting documents were collated and detailed CLEER and equivalencies calculations are presented in Annex A of this report.

Indicator 5 – Projected GHG emissions reduced or avoided through 2030 from adopted laws, policies, regulations, or technologies related to CE as supported by U.S. Government assistance, in $mtCO_2e$ (EG 12-7)

No target has yet been set for this indicator. The projected GHG emission reduction or avoidance through 2030 from the solar streetlights that became fully operational in Marawi City during the option year was estimated at 5,576.50 $mtCO_2e$ through 2030—3,029.10 mtCO2e was due to displacement of grid electricity by solar RE, while the replacement of HPS lamps with light-emitting diode bulbs contributed to a further reduction of 2,547.40 $mtCO_2e$. The total GHG reduction equals removing about 1,194 gasoline-powered cars from the road in 1 year or growing about 144,521 tree seedlings for 10 years.

Indicator 6 – Number of laws, policies, strategies, plans, or regulations addressing climate change (mitigation or adaptation) and/or biodiversity conservation officially proposed, adopted, or implemented as a result of U.S. Government assistance (EG 12-3)

Three distinct policies that address climate change issues were implemented and validated within the option year; thus, the number of accomplishments for this indicator is three, which is 100 percent of the option year target. The outputs are described below:

1. IRR of EO 30: The IRR was issued on April 25, 2018, as DC 2018-04-0013. B-LEADERS supported the focus group discussion (FGD) to review the draft IRR and the implementation of a series of information, education, and communication (IEC) campaigns nationwide.
2. *RA 11054: An Act Providing for the Basic Law for the Bangsamoro and Abolishing the Autonomous Region in Muslim Mindanao, Repealing for the Purpose RA 9054, entitled "An Act to Strengthen and Expand the Organic Act for the Autonomous Region in Muslim Mindanao (ARMM)*," and *RA 6734, "An Act Providing for an Organic Act for the ARMM," and for Other Purposes.*

3. DC 2018-07-0019: Promulgating the Rules and Guidelines Governing the Establishment of the GEOP Pursuant to the *RE Act of 2008*.

Indicator 7 – Number of people trained in CE supported by U.S. Government assistance (EG 12-1)

Training sessions were provided on 1) Operations, Commissioning, and Maintenance of Solar PV Streetlights; 2) RPS; 3) Hydrological Resource Analysis Modeling; and 4) Power Sector for Mindanao. The workshops capacitated 585 people, which is 293 percent of the option year target.

Indicator 8 – Number of institutions with improved capacity to address climate change issues as a result of U.S. Government assistance (EG 12-2)

The capacity of 228 institutions to address climate change issues has improved as a result of U.S. Government assistance, which represents 228 percent of the option year target.

Figures 3, ***4***, and ***5*** present the summary infographics for all the option year indicators.

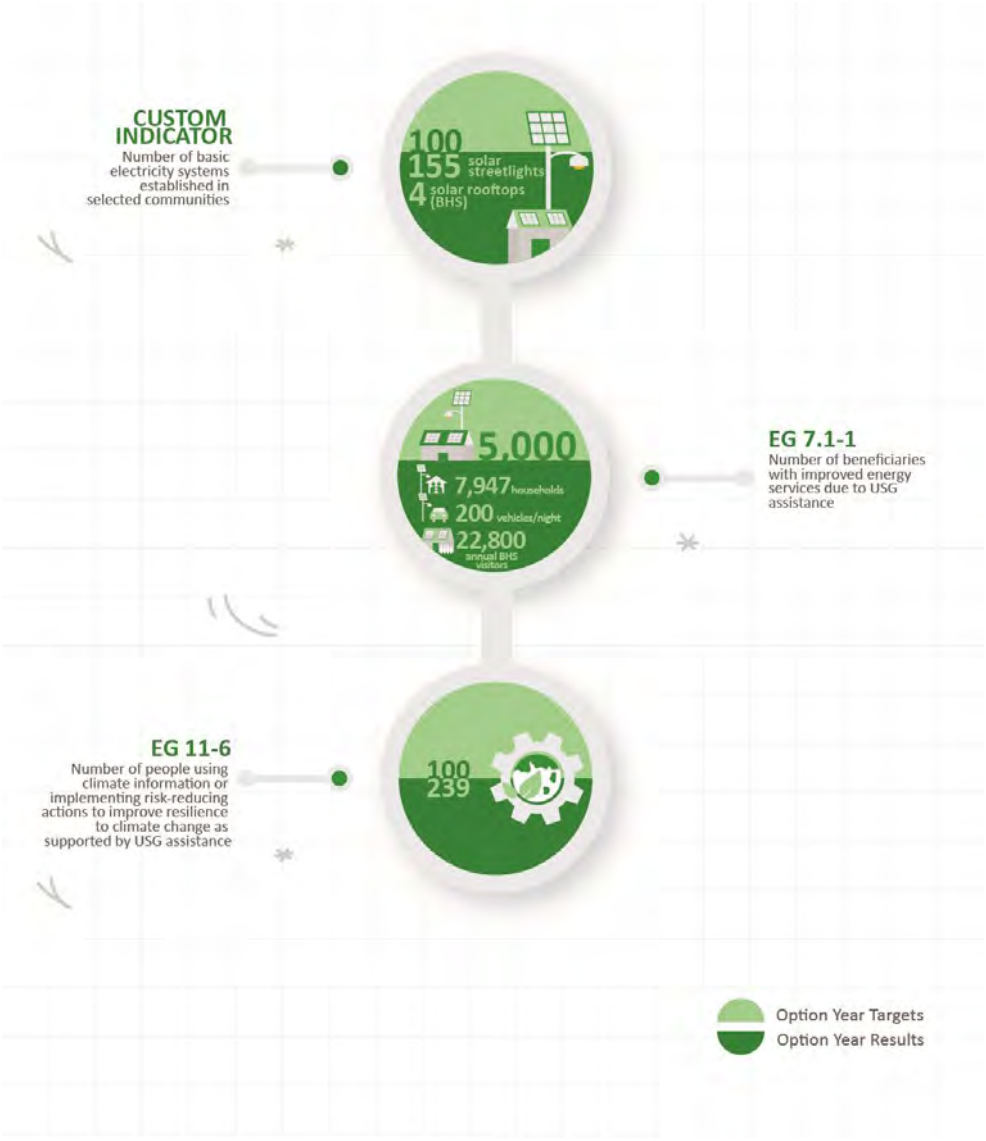


Figure 3. Summary of Indicators 1 to 3 from February 1, 2018, to January 31, 2019

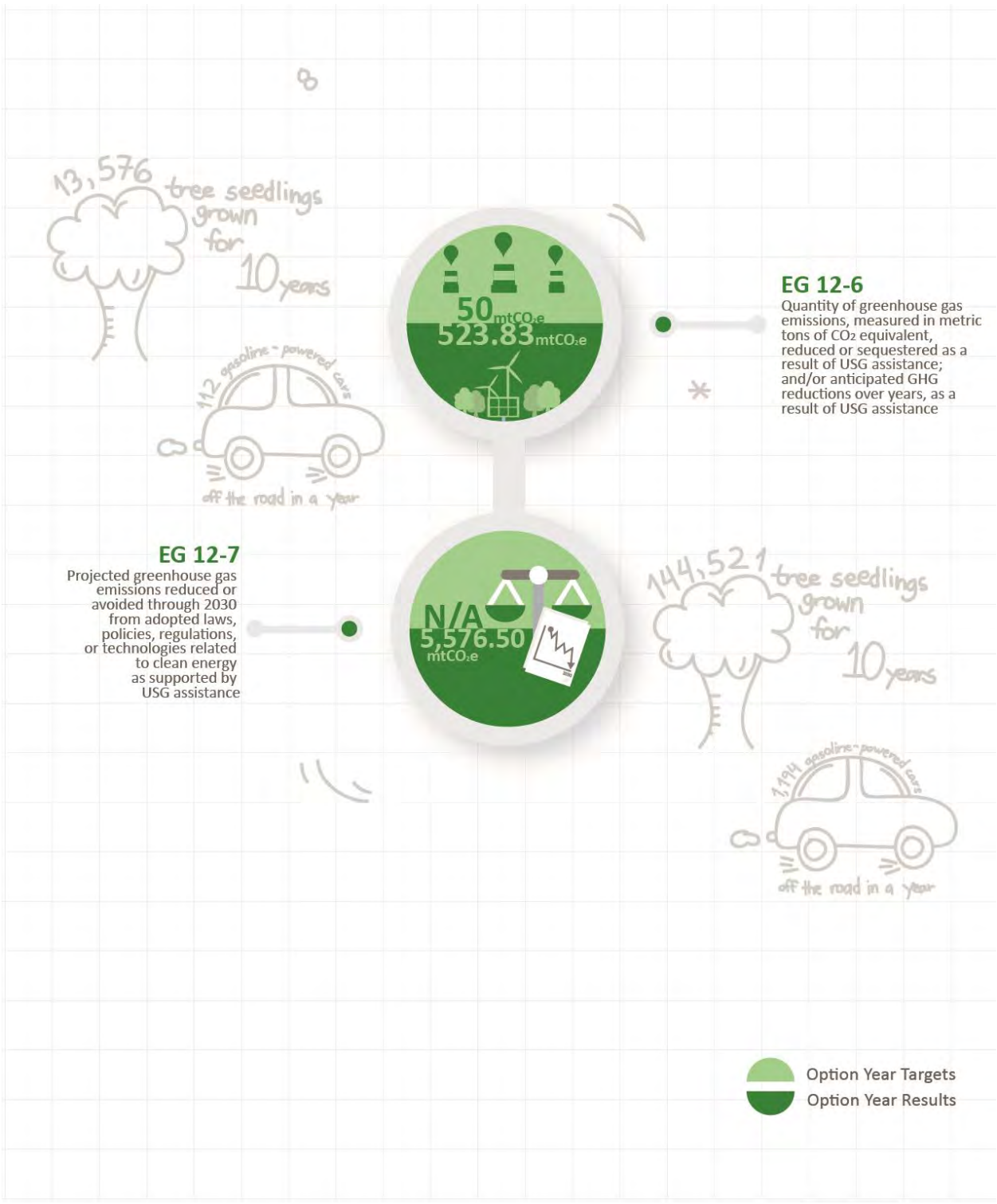


Figure 4. Summary of Indicators 4 to 5 from February 1, 2018, to January 31, 2019

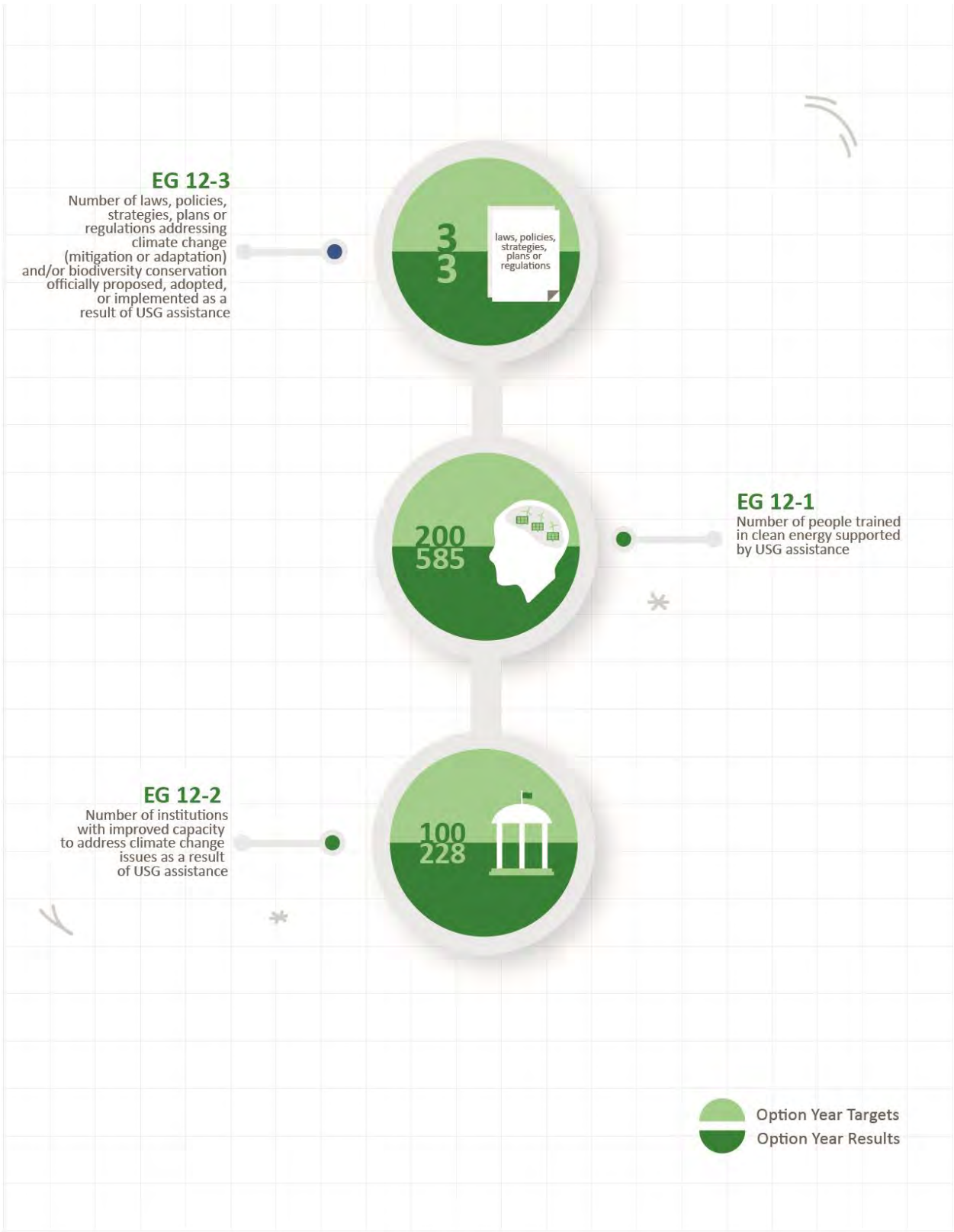


Figure 5. Summary of Indicators 6 to 8 from February 1, 2018, to January 31, 2019

B. PERFORMANCE INDICATORS FROM FEBRUARY 1, 2014, TO JANUARY 31, 2018

For B-LEADERS's base period covering February 1, 2014, to January 31, 2018, targets for seven performance indicators were identified under the B-LEADERS PMP. The PMP also includes two other performance indicators that were added for cursory monitoring to conform to changes in the GCC and EG indicators. The base period's M&E Plan adhered to the indicators under the *GCC Indicator Handbook* (updated June 10, 2015) and the *2016 GCC Standard Indicator Handbook* for the new indicator, *EG 12-1*. Performance data are likewise verifiable through periodic DQAs.

The project's major deliverables for the base period were achieved. As of January 31, 2018, B-LEADERS achieved 156.6 percent of its committed life-of-project[5] (LOP) target (*GCC 4.8-7*) for GHG emissions reduced, avoided, and/or sequestered, and reached 107.1 percent of its target for CE capacity installed (*GCC 4.8.2-32*). *GCC 4.8.2-10* achieved 226.2 percent of the LOP target of mobilizing investments for climate change. The project also met other LOP targets: *GCC 4.8.2-28*, related to policies proposed or adopted, the custom indicator on climate tools developed or adopted, as well as *GCC 4.8.2-29* and *GCC 4.8.2-14*, related to improving the capacities of individuals and institutions.

For the project's base period, the highlights for each indicator are described below.

Indicator 1 – GHG emissions, estimated in $mtCO_2e$, reduced, sequestered, and/or avoided as a result of U.S. Government assistance (GCC 4.8-7)

For the entire base period, a total of 563,648.83 $mtCO_2e$ was reduced, sequestered, and/or avoided, representing 156.6 percent of LOP target. The figure is the equivalent of taking approximately 120,696 gasoline-powered cars off the road in a year, switching 18.9 million incandescent lamps to light-emitting diode bulbs, or growing approximately 14.6 million tree seedlings for 10 years.

The estimate of GHG emissions avoided or reduced was based on the capacity of operational RE projects that were completed under Indicator 1. The USAID CLEER Tool and U.S. EPA's online GHG Equivalencies Calculator were used for this purpose. B-LEADERS fully documented the tools, methods, data inputs, and data sources used. Supporting files were collated from DOE and from the project proponents.

Indicator 2 – Number of laws, policies, strategies, plans, agreements, or regulations addressing climate change proposed, adopted, or implemented as a result of U.S. Government assistance (GCC 4.8.2-28)

In the first 4 years of B-LEADERS implementation, sustained work with key partners resulted in the adoption or implementation of 29 significant policies, strategies, plans, and agreements. B-LEADERS exceeded its goal for this indicator, reaching a total of 145 percent of its target.

[5] LOP covers B-LEADERS's base period from February 1, 2014, to January 31, 2018.

Indicator 3a – Number of person-hours of training completed in climate change as a result of U.S. Government assistance (GCC 4.8.2-29)

Various trainings, consultations, and capacity-building related activities resulted in a total of 57,316 person-hours of capacity building, which is 494 percent of LOP target.

Indicator 3b – Number of people trained in CE supported by U.S. Government assistance (EG 12-1)

Although number of people trained is not a mandatory performance indicator, the project started tracking this number when the indicator was introduced during the first quarter of 2017. The project trained a total of 5,214 people during the project's base period.

Indicator 4 – Number of institutions with improved capacity to address climate change issues as a result of U.S. Government assistance (GCC 4.8.2-14)

Due mainly to its active partnership-building strategy, the project helped build the capacity of 1,084 institutions, which is 2,168 percent of LOP target. These institutions include NGAs, LGUs, and others from academia and the private sector. The activities focused on the use of various tools, skills, and approaches for LEDS contributing to the enhanced mitigation CBA study, national GHG inventory, and compliance with the *RE Act of 2008*.

Indicator 5 – Number of climate mitigation and/or adaptation tools, technologies, and methodologies developed, tested, and/or adopted as a result of U.S. Government assistance (Custom Indicator)

In the past 4 years, B-LEADERS developed, tested, and/or adopted 27 tools, technologies, and methodologies, representing 150 percent of LOP target. Examples include the *Entity-Level GHG Inventory Guidance Manual*, Mitigation CBA Analysis Spreadsheet Models for the Wastewater Sub-sector, Grid Resiliency Monitoring Equipment customized for PALECO, and others.

Indicator 6 – CE generation capacity installed or rehabilitated as a result of U.S. Government assistance (GCC 4.8.2-32)

B-LEADERS provided sustained mentoring support for CE project developers and helped improve the business permitting process. These measures led to increased CE generation capacity. A total of 242.0645 MW of additional capacity, representing 107 percent of LOP target, was achieved during the project's base period.

B-LEADERS procured 50 units of solar streetlights for Marawi during the base period, which were installed and later officially handed over to LASURECO. This initiative contributed to an additional 3.50 kW of CE in solar panel capacity.

Indicator 7 – CE generation capacity supported by U.S. Government assistance that has achieved financial closure (GCC 4.8.2-33)

This indicator had no target and was not treated as a deliverable, but was tracked because it was included in the *GCC Handbook* updated on June 10, 2015. By the end of the project's base period, 278.9 MW of CE generation capacity achieved financial closure.

Indicator 8 – Projected GHG emissions reduced or avoided through 2030 from adopted laws, policies, regulations, or technologies related to CE as supported by U.S. Government assistance (GCC 4.8.2-34)

Similar to Indicator 7, this indicator had no target and was not treated as a deliverable, but was tracked due to its inclusion in the *GCC Handbook*. The combined projected GHG emissions avoidance from 2015 through 2030 is 5,781,651.42 $mtCO_2e$. These values were estimated and revalidated using the latest version of USAID CLEER.

This value for GHG avoidance is the equivalent of taking approximately 1,238,041 gasoline-powered cars off the road in a year, switching 193.5 million incandescent lamps to light-emitting diode bulbs, or growing approximately 149.8 million tree seedlings for 10 years.

Indicator 9 – Amount of investment mobilized (in USD) for climate change supported by U.S. Government assistance (GCC 4.8.2-10)

In B-LEADERS's first 4 years of sustained mentoring and partnership to mobilize investments in CE, the project facilitated funding of USD 579,408,025.68. This represents 227 percent of LOP target.

Figures 6, ***7***, and ***8*** present the summary infographics for all the base period indicators.

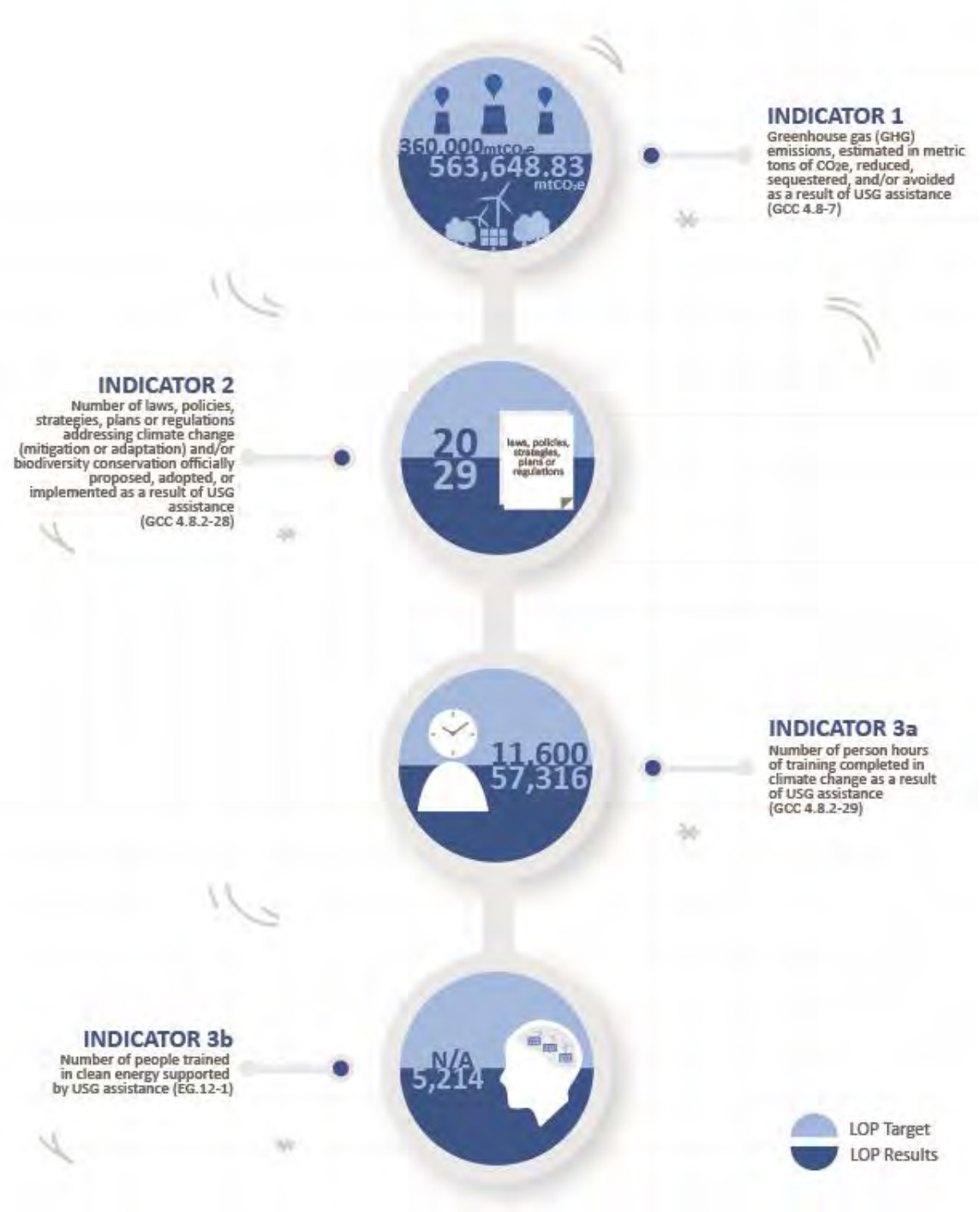


Figure 6. Summary of Indicators 1 to 3b from February 1, 2014, to January 31, 2018

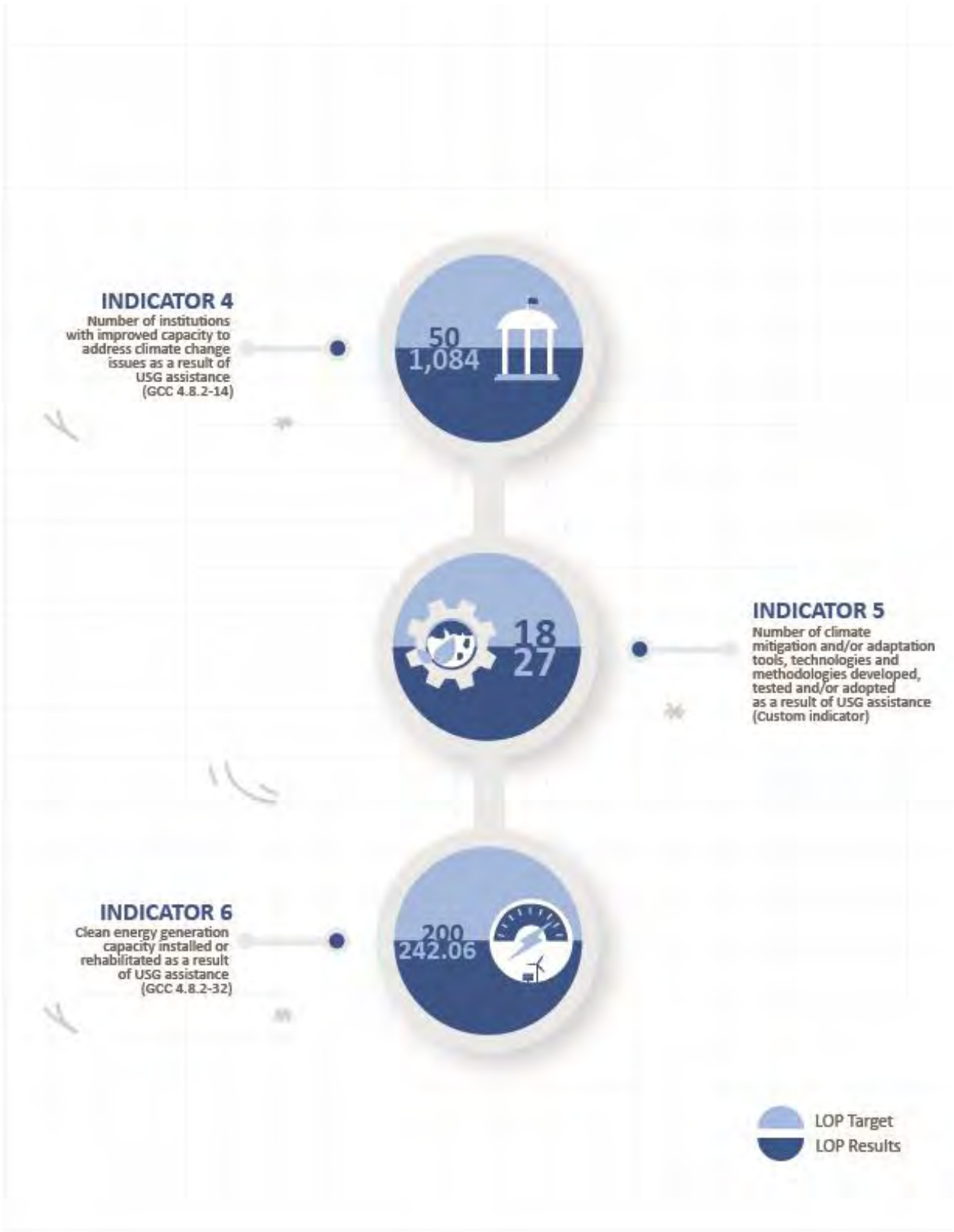


Figure 7. Summary of Indicators 4 to 6 from February 1, 2014, to January 31, 2018

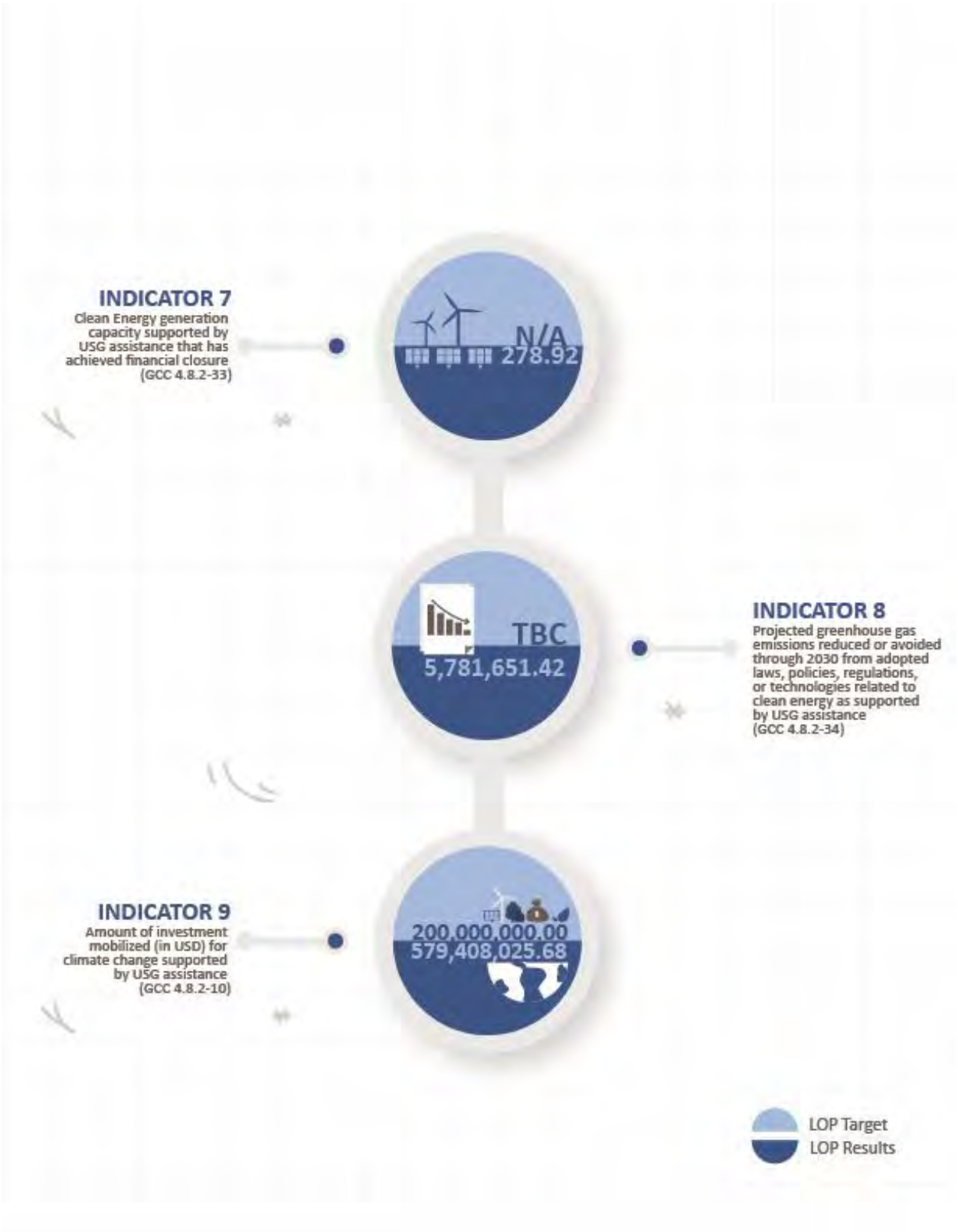


Figure 8. Summary of Indicators 7 to 9 from February 1, 2014, to January 31, 2018

C. AGGREGATED CONTRIBUTIONS

Throughout B-LEADERS's implementation period (February 1, 2014, to January 31, 2019), the project trained a total of 6,038 people in CE, and improved the capacity of 1,312 institutions in addressing climate change issues as a result of U.S. Government assistance. In addition, a total of 32 laws, policies, strategies, plans, or regulations addressing climate change (mitigation or adaptation) and/or biodiversity conservation have been officially proposed, adopted, or implemented through B-LEADERS.

Although B-LEADERS stopped its mentoring support for CE projects at the end of its base year on January 31, 2018, the 242.0645-MW CE projects installed under the project continue to operate and are expected to continue operations beyond January 31, 2019. These installations will contribute to further GHG emissions reduction year after year. Together with the 159 additional units of solar streetlights and rooftops procured for Marawi City during the option year, B-LEADERS has cumulatively reduced or avoided GHG emissions by 1,046,195.51 $mtCO_2e$ due to the additional 242.0785 MW of CE capacity installed. By 2030, these projects could cumulatively contribute a total GHG reduction of at least 6 million $mtCO_2e$.

D. PUBLIC-PRIVATE PARTNERSHIP

In all activities, the project sought the support of both public and private partners to leverage project funds and maximize project impact. Cash contributions and in-kind resources were consistently documented and verified. Claims on leveraged funds were recorded in each form duly filled in and signed by the cost-sharing partner.

From February 1, 2014, to January 31, 2019, the total contribution from partners was valued at USD 582,332,903.36. This represents both the USD 579,408,025.68 mobilized public and private investments for CE installation and rehabilitation as reported in Indicator 9 of the base period as well as the USD 2,924,877.68 leveraged public and private sector funds for climate change related communication and outreach activities from both the base and option periods.

E. GENDER OUTCOME

As the project continued to build institutional and individual capacities to enhance climate change actions, it also sustained its efforts to provide a gender lens in most of its activities. Gender-disaggregated data were monitored during B-LEADERS's 5 years of implementation specifically related to gender representation at workshops and trainings provided by the project. From February 1, 2014, to January 31, 2019, approximately 48.4 percent of the 6,038 training participants were women. In addition, women accounted for approximately 40.2 percent of those who used and applied climate information in hydrological resource analysis modeling, VRA, and resiliency planning during B-LEADERS's last year.

SECTION 3: KEEPING THE LIGHTS ON IN MARAWI CITY

USAID has a long history of partnership with DOE in providing TA to support GPH's long-term vision of building enhanced resilience in energy systems, especially in regions of the Philippines considered most vulnerable to both human-induced and natural disasters. During its last year, B-LEADERS focused largely on providing TA for the reconstruction and rehabilitation of Marawi City following the ISIS-led siege. The city was held hostage for several months and much of its infrastructure, including power and water supplies, was destroyed.

B-LEADERS reinforced its presence in Marawi City and strengthened its relationships with key stakeholders through continued support and guidance for key government partners. These activities included installation of solar-powered streetlamps in or adjacent to the transitory resettlement areas of Barangay Sagonsongan, Sarimanok Shelter Camps 1 and 2, and the CRS resettlement site in Raya Guimba. Four BHS buildings also received solar rooftop installations to help maintain operations at its medical facilities.

Three other initiatives were led by the project: Recovery and Validation of the LASURECO Database initiative, Strengthened Power System Resilience in Marawi and Outlying Areas study, and the conduct of VRA for the Reconstruction and Rehabilitation of Marawi City. These activities directly contribute to the rehabilitation of LASURECO and help fulfill the need for short- and long-term development support to partners and stakeholders operating in Marawi.

A. SOLAR-POWERED STREET AND CAMP LIGHTS

Responding to the urgent call to "keep the lights on," the B-LEADERS team mobilized a construction crew in April 2018 to lay down foot foundations and complete the installation of the solar-powered streetlamps at the Sagonsongan temporary shelter. The shelter currently houses about 6,000 IDPs, and the street lighting boosted the sense of safety and security among those residing in the shelter. The first 50 solar units installed, which were procured during B-LEADERS's base period, were officially handed over to LASURECO on May 17, 2018. Each 30-W panel has an equivalent of 70 W for each luminaire, contributing to a total of 3.5 kW of CE capacity.

During its last year, the project procured 98 additional units of solar PV streetlamps and installed them to augment the street lighting requirements of the Sagonsongan temporary shelter. An estimated 4,878 residents from Barangay Sagonsongan alone benefited from the communal lighting provided by B-LEADERS. Moreover, a week-long closed-circuit television monitoring of motorists travelling through the streets of Sagonsongan from 6 p.m. to 5 a.m. revealed an average of 200 passing vehicles per night that benefited from the lighting.

Installation of solar PV streetlights at Sagonsongan temporary shelter in Marawi City. Photo credit by B-LEADERS.

"The solar streetlights project of DOE and USAID/B-LEADERS had an immediate positive impact in the resettlement site at Barangay Sagonsongan. I have been there myself at night and the more illuminated surroundings bring a better sense of well-being and security to the IDPs. I hope we can do more of these as we continue to rebuild Marawi…. The involvement of DOE-IPO in all the activities of the project, e.g., analysis of the process, data gathering, close coordination with the various entities involved, and continuous communication and feedback on the progress [have been our contributions to the partnership]." Ms. Nordjiana Ducol,
Acting General Manager, LASURECO. Photo credit by B-LEADERS.

In coordination with key government partners, B-LEADERS continued to conduct field visits and initial assessments of possible additional sites for solar streetlight installation, and subsequently provided solar lighting in other IDP communities in Marawi City. Sarimanok 2, in particular, currently hosts 212 families totaling about 1,400 people. Residents of the camp expressed fears and concerns for the safety of women and children; there had been reports of trespassing during the night, and even the local community patrol admitted difficulties in securing the perimeter without adequate lighting.

Acting on a formal request from the camp manager, 17 lighting units were provided to Sarimanok 2 Shelter Camp on August 12, 2018. With the streetlights, Sarimanok 2 Camp Manager Rismirah Adap of the Marawi City Social Welfare and Development Office reported that "women and children are no longer afraid to go out and stay out of their tents at night. They feel safe going to bathing areas and comfort rooms."

Similar support was provided to Sarimanok 1 Shelter Camp, where the installation of 10 units of solar-powered streetlights was completed on September 29, 2018. The solar PV streetlights installed at both Sarimanok resettlement sites benefited a total of 2,079 IDPs.

Community activities at Sarimanok 2 Camp increased after solar streetlights were installed. Photo credit by B-LEADERS.

Through USAID's Support to People Displaced by the Marawi Conflict – Early Recovery Implementation, B-LEADERS collaborated with its implementing partner, CRS, to provide similar TA. CRS has been supporting households from the areas most affected by the siege of Marawi City to move back to their city while preserving their dignity and helping them become self-sufficient. The project built a transitional site that functions as a temporary community to begin recovery within the city of origin. As of November 2018, 22 streetlights were erected at the CRS Raya Guimba resettlement site, which is home to an estimated 990 IDPs. The remaining eight units in the inventory were donated to CRS for installation in other sites within the city. B-LEADERS partnered with CRS to uphold USAID's call for stronger cooperation and coordination among projects.

In line with overall sustainability, B-LEADERS secured extended warranties that cover the streetlights until 2023 to ensure that LASURECO will have ample time to incorporate maintenance costs of the streetlights into its annual budget after the warranty expires.

B. SOLAR ROOFTOPS FOR BARANGAY HEALTH STATIONS IN MARAWI CITY

B-LEADERS explored partnerships with USAID's MindanaoHealth Project, which is helping the Department of Health strengthen health systems, sustain health service improvement, and reach people living in rural areas.

In line with MindanaoHealth's goal to provide humanitarian assistance in conflict-affected areas, including Marawi City and its environs, B-LEADERS supported the resumption and improvement of basic health services in the city by providing solar PV rooftop facilities that will supply basic electricity needs. The facilities of four selected BHS—Olowa Ambolong, Sugod, Tuca, and Basak Malutlut—each had 1.5-kW solar rooftop systems installed. Upon installation, BHS personnel and barangay officials of each site were oriented on the operation, maintenance, and basic troubleshooting of the equipment.

Since its installation in October 2018, this initiative has begun to improve the delivery of public health services for the local community and families of IDPs. The reliable supply of electricity addresses the most imminent energy needs of the health stations through lighting, ventilation, and charging of communication devices. A total of 22,800 visitors per year are estimated to benefit from the solar rooftops.

On November 14, 2018, MinDA Secretary Datu Abul Khayr Dangcal Alonto visited the project sites of B-LEADERS and led the ceremonial turnover of the solar rooftop systems to the local barangays.

MinDA Secretary Alonto visits the solar rooftop installed at Sugod Health Station and interacts with barangay health workers. Photo credit by B-LEADERS.

C. RECOVERY AND VALIDATION OF THE LASURECO DATABASE

On request of LASURECO, B-LEADERS helped the utility recover its database of consumers, which was destroyed or lost during the 5-month siege. The recovery of LASURECO's database is critical to its financial stability because it will allow the utility to resume its billing and collections operations. Safeguarding the EC's core funds will enable it to continue its services to Marawi City's residents and establishments. Another potential use of this effort is to establish a baseline on LASURECO's current status that can be used to determine if any GPH resources are available to help the EC.

B-LEADERS facilitated the signing of a Memorandum of Understanding (MOU) between LASURECO and the Association of Mindanao Rural Electric Cooperatives, Inc. (AMRECO), which was engaged to assist LASURECO in the recovery and validation of its customer database. A census was conducted house-to-house to gather customer data. B-LEADERS engaged 10 survey teams to conduct the census, and the project donated 10 smart tablets with annual subscriptions to the digital software, Quick Tap Surveys, to facilitate the process. Two more software subscriptions were also donated for use in LASURECO's additional tablets.

By the end of November 2018, the project team was able to complete the survey of households in Marawi City and eight other municipalities in District 1 of the Province of Lanao del Sur, which are within the franchise area of LASURECO. A total of 32,384 households have been mapped, with the project being able to survey and validate a total of 30,016 households in 327 blocks or barangays within the targeted survey areas.

D. STUDY ON STRENGTHENED POWER SYSTEM RESILIENCE IN MARAWI AND OUTLYING AREAS

The study on Strengthened Power System Resilience in Marawi and Outlying Areas provided a full assessment of the damage with asset valuation of LASURECO facilities. The aims were to develop alternative scenarios for a more resilient power system for Marawi City and to serve as a basis for subsequent mobilization of public and private funds. The project completed the activities summarized below.

- Completed a full assessment on the extent of postconflict damage to the power infrastructure of LASURECO.
- Completed an inventory of equipment and supplies needed for power restoration.
- Conducted a valuation of existing assets of LASURECO, including substations, distribution lines, transmission lines, distribution assets and facilities, and real estate property costs (thus far, the value is estimated at USD 14 million).
- Proposed alternative scenarios to develop the resiliency of the power system of Marawi City, with corresponding estimated value of USD 128 million.

- Successfully facilitated/mobilized the donation of equipment from the Aboitiz Foundation and the Davao Light and Power Company to LASURECO. Estimated cost for the donated equipment was USD 35,000, which include the following:
  - 3 x 40 meters of 500,000 circular mils of power cables with one lot of reinforced supporting structure, which can be installed to increase the capacity of the Dansalan substation;
  - Two units of 69-kilovolt (kV) oil circuit breakers, which can be installed in Dansalan and another substation within the LASURECO franchise area;
  - Five units of 15-kV oil circuit breakers, which could be used in the Malabang and Ganassi substation and its outlying areas, which could be used for the creation of mobile substations; and
  - 160 pieces of 25-footer concrete poles, which could be used for lateral lines in the rural areas of LASURECO.
- Identified potential plans/actions designed to mobilize government and private funds to restore electricity services and provide economic opportunities for the Maranao people:
  - Community-based livelihoods and jobs;
  - Community-based EE measures and energy conservation programs;
  - Installation of solar streetlights;
  - Assessment of end-user needs for various RE technologies and business models;
  - Construction and installation of RE systems, community organizing, training of operators and technicians, and conduct of financial and economic analyses;
  - Education of the community on modern farming technologies with corresponding government provision of needed materials;
  - Provision of modern transportation facilities, e.g., RE-powered vehicles;
  - Tourism; and
  - Load/demand forecast for the LASURECO franchise area, including determination of annual load growth from 2018 to 2033 and identification of demand risks.

E. RISK AND VULNERABILITY ASSESSMENT FOR THE RECONSTRUCTION AND REHABILITATION OF MARAWI CITY

B-LEADERS has conducted a series of workshops on VRA and resiliency planning, which provided guidance to LASURECO on the development of an RCP and Emergency Restoration Plan (ERP) as well as the creation of the ERP team and its structure. A series of workshops was delivered in fiscal year (FY) 2018. The first workshop, held August 13–14, 2018, provided a venue for LASURECO to revisit its operations before and in the aftermath of the Marawi siege; identify plans, programs, projects, and activities to recover from the crisis; and consequently prepare for a resilience plan for its distribution network.

A second workshop at Ayala Resort Hotel in MSU-Marawi drew 21 participants and focused on the reporting and validation of DOE's RCP and on NEA's policy on electric cooperatives' VRA and ERP on critical assets. This session, held August 28–29, 2018, provided training on the principles and practices of disaster resilience and participatory risk assessment tools such as brainstorming, FGDs, problem/objective tree analyses, root-cause analysis, and logical framework design. During the workshop, LASURECO was able to comprehensively examine its organizational structure, functions, and operations; affected substations and consumers; inventory of mortgage properties; electricity sales; and Damage and Loss Assessment (DALA) report. Specifically, carrying out a DALA following disasters can help to determine postdisaster needs, including economic recovery planning and reconstruction program design, and to monitor progress of both economic recovery and reconstruction.

The third workshop focused on resiliency metrics, disaster hazard/risk significance matrix, risk mapping, and primary survey design. It was held at Country Village Hotel in Cagayan de Oro City on September 12–13, 2018, and had 24 participants. During the workshop, LASURECO continued to reflect on how to further improve its organization, assets and income, operations, and DALA report. The fourth workshop was held at N Hotel in Cagayan de Oro City on September 27–28, 2018. Twenty LASURECO personnel participated in the prioritization of RCP projects and their prefeasibilities, financial modeling, and business plan development. The participants also provided input to a customized guide that was tailored after the United Nations Office for Disaster Risk Reduction's disaster resilience kits. Another workshop on October 23–24, 2018, in Iligan City, attended by 24 LASURECO staff members, finalized LASURECO's draft ERP and comprehensive RCP.

On November 13, 2018, the NEA VRA and ERP and the DOE RCP documents were further reviewed and finalized with input from NEA representative to the LASURECO Board, Engr. Ramon Carlos Florese.

F. COORDINATION WITHIN USAID FRAMEWORK OF ASSISTANCE TO SOUTHERN PHILIPPINES

On August 3, 2018, USAID convened a meeting with LASURECO to provide a progress report and briefing on the concurrent initiatives being led by B-LEADERS in Marawi City. Ms. Lily Gutierrez of the USAID Environment Office guided discussions on the ongoing efforts to install the solar streetlights in selected temporary IDP shelters. The progress report also covered the LASURECO database recovery efforts and the VRA and resiliency planning initiatives. These activities will help build the resiliency of LASURECO as an EC as it strives to rehabilitate its power systems and develop its RCP, which would play a vital role in the well-being and security of the Maranao people.

In addition to progress reporting, the meeting between USAID and LASURECO provided a venue to seek guidance and suggestions for B-LEADERS to address the immediate needs and concerns of LASURECO. The meeting also explored possible collaborations with other USAID implementing partners operating in Marawi City, with the aim of fostering partnerships and synergies.

(Left) LASURECO General Manager Nordjiana Ducol expresses appreciation of military personnel and residents of Barangay Sagonsongan for the initial 50 units of USAID-supported solar streetlights that were installed along the highway. (Right) USAID Energy Policy Specialist Lily Gutierrez expresses hope that the activities being implemented by B-LEADERS will continue to contribute to energy resiliency in Marawi City. Photo credit by B-LEADERS.

Further coordination was needed within the overall framework of development and humanitarian assistance programs in the southern Philippines, particularly in Marawi City. A USAID symposium on Oversight of Humanitarian Aid in the Southern Philippines was organized to ensure compliance with the reporting requirements and strategies of all USAID and U.S. Government project implementers present in Marawi City. On May 18, 2018, members of the technical and administrative staff of B-LEADERS attended the symposium, which was hosted by the USAID Office of Inspector General (OIG) with support from the U.S. Department of State Inspector General (IG) and the U.S. Department of Defense (DOD) IG. The workshop emphasized that TA to Marawi City is under Operation Pacific Eagle–Philippines (OPE-P). Designated as a contingency operation on September 1, 2017, OPE-P is a comprehensive counterterrorism campaign of DOD in coordination with other U.S. Government agencies and international partners, to support GPH and its military in their efforts to isolate, degrade, and defeat ISIS affiliates and other terrorist groups in the Philippines. As such, all projects working under this TA are to be subject to rigorous checks, audits, and investigations by the OIGs of the three U.S. NGAs to ensure strict accountability and verify that no funds are being funneled to support violent extremism in the region.

G. LOCAL EMPOWERMENT AS SUSTAINABILITY MECHANISM

B-LEADERS complemented the installation activities with trainings on the O&M and Warranty Call Procedures for the solar PV streetlights. The first training was held on June 19, 2018, attended by three technical and administrative staff members from LASURECO and 14 potential solar installation crew members from Marawi City. The second O&M training session, held on November 26, 2018, built the capacities of an additional 14 participants composed of LASURECO personnel and the local crew that was involved in streetlight installation. The workshops covered the basics of solar energy and its various applications, locations, and technical specifications of the installed solar PV streetlights, their O&M, and the coverage of the extended warranty service. This capacity-building activity fulfills the project's sustainability goals, that is, to ensure uninterrupted operation of the solar streetlights to support future social and economic activities in the area. The training also

strengthens the technical capability and local presence of suppliers and installers as support to LASURECO and for expansion of similar initiatives in the future.

Once again, B-LEADERS partnered with another USAID project, MYDev, to add value to USAID's work in Mindanao. MYDev deploys additional resources to address the needs of youth in communities affected by the Marawi crisis. The project develops youth-focused resiliency and preventing violent extremism curricula for Mindanao youth. In collaboration with MinDA, B-LEADERS and MYDev provided three 2-day training workshops on basic solar PV technology for OSY from the Municipalities of Balo-I and Saguiaran and Marawi City on October 29–30, November 5–6, and November 7–8, 2018, respectively.

The 77 workshop participants completed their certification course on Electrical Installation and Electronic Products Assembly under the TESDA National Certification 2 Program. The training workshops were designed to enhance the knowledge and skills of OSY and provide them with more educational and career opportunities.

(Left) Mentors teach participants about the components of solar streetlights and (Right) solar PV panels.

(Left) B-LEADERS's installation crew demonstrates how to install a solar streetlight that OSY participants (Right) replicated during the trainings. Photo credit by B-LEADERS.

H. TOUCHING PEOPLE'S LIVES

The support provided by USAID, through B-LEADERS, to help rebuild Marawi was primarily meant to enhance the physical infrastructure and facilitate gradual resumption of delivery of basic services in the city and its environs. However, the project has also touched people's lives. As the Maranao people rebuild their lives, they rebuild relationships and communities. These are essential building blocks for Marawi's aspirations for long-term economic development and long-lasting peace. Some of the stories of newly empowered individuals and families are recounted below.

Ms. Monera Macabago, a resident of Area 4 of the Sagonsongan Transitional Shelter Site in Marawi City shares her and her family's stories of survival and how the solar streetlights have made their area brighter and safer. Photo credit by B-LEADERS.

When the Marawi Siege started on May 23, 2017, Monera Macabago and her family initially thought that the conflict would be over in 1 day, as was the case in earlier incidents of unrest in the city. On the second day of the conflict, the firefight violently intensified, and Monera and her husband realized that the situation would only get worse. They fled Marawi in haste, bringing only the children's clothes and few other personal possessions. In an attempt to retrieve important documents and items, Monera's husband and brother-in-law went back to their home later on the second day of the siege. They barely made it out with their lives as bullets sped past them, hitting concrete walls and arches as they fled. "We are all lucky to be alive. But it saddens me that we have lost everything we had. Life was not perfect then, but at least we had our sari-sari store then, and our relatives were just near us. We had some food to eat every day, and we had support," Monera related.

Along with thousands of other families displaced by the conflict, Monera searched for shelter, and eventually moved into the home of a distant relative in nearby Saguiaran, where she and her family stayed for many months as evacuees. "Life was hard. We had no work, no source of food. The

children were out of school. We had to depend on the help of other people." Monera shared their challenges during their months of homelessness, but added a positive note on their experience. "We learned how to plant vegetables, to do backyard farming. This helped us augment our daily food needs."

In early 2018, Monera and her family finally moved into their new home in the Sagonsongan Transitional Shelter site. "There are still many problems that we face. Recently, the supply of relief goods has stopped. Work is still hard to come by and we are far from our relatives," Monera shares. "But we are thankful that we now have our own space, even if it is just small. We have our own backyard garden, and we can see that there are projects being implemented here in Sagonsongan."

"One project we like is the installation of streetlights here in Sagonsongan," Monera noted. "I am glad that my relative was trained to become one of the installers of solar streetlights. He helped us in our daily needs, and it has given him skills which he can use in other job opportunities." More importantly, Monera said the lighting "has made our place so much brighter, and we feel more secure, safer." Monera says that the bright lights give them a sense of hope: "It makes us feel that things will become better, and we hope that more lights will be constructed near our homes, and that other projects will be implemented quickly."

Ms. Asmeah Cosair and Mr. Usodan Cotawato, residents of Area 2 of the Sagonsongan Transitional Shelter Site in Marawi City, recount the siege and it impacts on their lives. As one of the local crew trained by B-LEADERS, Mr. Cotawato said that learning to install solar streetlights will help him find jobs in the future. Photo credit by B-LEADERS.

Asmeah Cosair and Usodan Cotawato fled Marawi City on the day of the siege via a small lantsa or pump boat. The boat had so many people on board that Asmeah and Usodan thought it would sink into the lake. On their way out of the city toward the municipality of Marantao, more people fleeing from the battle lined up on the shore, waving at them to be picked up. Usodan sadly recounts,

"there were just too many people on the boat, and we cannot accommodate the people on the shore anymore." Their escape on a small boat led to many months of homelessness.

"It was a hard life. We lost everything," Asmeah recounts. "We did not have enough before the siege but at least we had our own place, and we had our friends and relatives around us. Living as evacuees was hard especially for women and children."

Despite the challenges, Asmeah and Usodan welcomed their first-born almost 1 full year from the start of the siege. "I am happy to be included in the crew that installed the solar streetlights," Usodan shares. "I learned so many things about solar technology, installation, and safety. I was able to do other tasks like securing the materials and monitoring the streetlights at night. We even installed a camera in one of the streetlights so that we can count the vehicles and people passing by. More than 1,000 families in Sagonsongan benefit from the streetlights." Usodan noted that the installation of the streetlights will help him find jobs in the future. "I hope that more opportunities like the installation of solar streetlights will come," he added.

Usodan added that the streetlights "made Sagonsongan a place to visit, even for people from nearby barangays. It has lighted up the main road which will soon become an alternate route going into the city." He further shared that "we hope that this project has a follow up and that other services improve, like water supply and livelihood."

Mr. Hadji Hassan Mikunug, camp manager of Sarimanok Tent 1 in Marawi City, appreciates the "lightning support" provided by USAID: "Within 1 month from our first meeting [with USAID], we already have bright lights." Photo credit by B-LEADERS.

Hadji Hassan Mikunug said that there are still so many things that needs to be addressed in the tent camp of Sarimanok 1. "We are not yet sure when we will transfer to our resettlement area and we have been waiting for months now," he emphasizes. "But we prefer to stay, where we are now; however, we really need more permanent shelters," he adds. "As you can see, our tents are very

temporary, and some of us have experienced having tents slashed open, and properties stolen. This is made worse by the lack of light in our camp. It really gets very dark here at night."

Hassan related how they saw nearby Sarimanok 2 get solar streetlights. "We found out how the Camp Manager there requested for lighting support from USAID, and so we did the same," he said, "and we are happy on how fast USAID responded to our request. Within 1 month from our first meeting, we already have bright lights. Sarimanok 1 tent camp is like Luneta Park now, or maybe like an airport, very bright," Hassan remarked with fondness. "All the 103 families here know that we have to take care of the streetlights, so we assigned 'caretakers' for each streetlight, particularly those who had streetlights right beside their tents."

"We hope that they develop this site for our permanent shelter, and that more support will come especially for the children," Hassan concluded.

Ms. Jaslia P. Abbas, a resident of Sarimanok Tent 2 and small retail store owner in Marawi City, noted how the IDP community feels comfortable staying outside their tents even past 6 p.m. Photo credit by B-LEADERS.

Jaslia said that they saw that Sagonsongan was lit up. "We can see Sagonsongan from Sarimanok 2 since we were on top of a hill, and we were amazed when Sagonsongan was lighted up and became so bright, it was beautiful, and we wished and prayed that our camp would also become that bright." Sarimanok 2 Camp Manager Rismirah Adap wrote USAID, requesting solar lighting.

"'Alhamdulillah! Alhamdulillah!' The children shouted and ran around the camp when the lights first came on," Jaslia shared with a smile on her face. "That day was memorable," she added. "When the USAID team completed the installation of the streetlights, we were eager to see how it worked. Since solar light is very new to us, we were curious. We looked for switches along the post and the foundation, and for wires as well. Since we did not find any, we thought the job was not yet done

and maybe the team will come back the next day to make it work. We settled down as dusk set in, then to our surprise, as the evening came, all the lights switched on and the entire camp was bathed in bright light. You can hear the 212 families in the camp exclaiming with joy when that happened," Jaslia recounted. "I immediately called our Camp Manager Rismirah Adap and excitedly said 'Ma'am, ma'am, we already have light!'"

Before the installation of the solar streetlights, Camp Manager Rismirah Adap and assistant camp coordinators Norhanifa Alimodem and Hanna Kaiza Walloh said there were only two public lights in the camp. The area was very dark and trespassers entered the camp at night. The residents feared for their security, especially for women and children; it was not easy to fetch water or go to the toilets at night. Local security patrols were always wary of armed groups coming in without them noticing.

"USAID responded within 1 week from the time the letter was submitted. We were very happy when the installation team visited us, but we did not expect the lights to be installed soon. To our surprise, we had bright lights within 1 month. We are very happy," Jaslia expressed.

Jaslia is among the community entrepreneurs who opened a sari-sari store, and she said that the lights helped increase sales at her store. "Before we had the streetlights, people were already inside their tents around 6 p.m., now that we have light at night, people stay out late longer, sharing stories, attending to some chores. In the process, people buy snacks, drinks, soap, and other things they need," she shared.

"We are amazed how the lights turn on automatically when it gets dark. We observed that the lights really wait until the evening darkness sets in," Jaslia noted. "Waiting for the lights to come has become some sort of a small evening activity for us here at Sarimanok 2."

MinDA and B-LEADERS project partners take a final photo with the streetlights on in Sagonsongan, Marawi City. Photo credit by B-LEADERS.

Reports on the activities of B-LEADERS in Marawi City are in Annex B.

SECTION 4: INTEGRATING THE THEMATIC AREAS OF WATER, ENERGY, FOOD, AND LAND USE

B-LEADERS continued its partnership with NWRB to strengthen initiatives on the integration of water, energy, and land use concerns with the long-term view of developing an integrated water security roadmap for the Philippines. Complementary capacity-building activities on the use of hydrologic models helped to identify options and directions for building the roadmap. To more specifically illustrate the integrative process of analysis, B-LEADERS has started developing water resource maps for all river basins in Mindanao, which will eventually be interfaced with the Department of Agriculture's (DA) National Color-Coded Agriculture Guide map.

A. WATER SECURITY FRAMEWORK ROADMAP DEVELOPMENT

B-LEADERS earlier supported MinDA with the Mindanao Water-Energy Nexus Study to determine how the changing climate could impact Mindanao Island's future water and energy supply. Building on this study, the project conducted a workshop with NWRB on November 16, 2017, to discuss partnerships for the development of the Philippines Water Security Roadmap. The partnership aimed to prepare the analytical framework for roadmap preparation and update the water resource maps. A follow-up workshop was held on December 13, 2017, to identify priority components, institutions, and data requirements. The workshop resulted in the initial mapping of key considerations and the identification of strategies for preparing the roadmap.

NWRB and B-LEADERS continued working together to integrate processes by linking maps, tools, and datasets from various agencies concerned with water resource management and use. This process would contribute to the eventual formulation of a more holistic and integrated water security roadmap. In line with this sustained initiative, a Stakeholders' Consultation on Water Security Framework Roadmap Development was carried out on May 24, 2018, at Dolcelatte, Quezon City. The consultation covered discussions and recommendations on the framework for integrated resource management and defined practical points and methods of coordination, data sharing, and harmonization. Ten key agencies participated in the consultation, including the National Economic and Development Authority (NEDA), Department of Public Works and Highways (DPWH), DA, CCC, MinDA, Laguna Lake Development Authority (LLDA), National Irrigation Administration (NIA), Philippine Atmospheric Geophysical and Astronomical Services

Administration (PAGASA), National Mapping and Resource Information Authority (NAMRIA), and the University of the Philippines at Los Banos (UPLB).

B. HYDROLOGICAL RESOURCE ANALYSIS MODELING

In support of the WEFN initiatives, B-LEADERS and NWRB jointly developed hydrologic models to quantify water-scarce and water-rich areas in the Philippines. A series of related workshops was conducted to capacitate the Philippine water sector on the use and application of the hydrological resource analysis modeling toolkit. On February 20–22, 2018, an introductory training workshop on hydrological resource analysis modeling was held in Pasig City. The workshop drew 27 participants from key government agencies involved in water resource management and utilization.

On May 28–30, 2018, in partnership with MinDA, training was conducted in Mindanao for key organizations involved in water resource management, including the different river basin organizations (RBOs), which are generally mandated to oversee and coordinate all development along their respective river basins and to ensure a holistic approach to water resources planning and management of the river basins. The workshop included in-depth discussions and hands-on exercises using the hydrological tools, which were supported with illustrative maps and user-friendly data input systems, all geared toward developing a common or integrative platform that will link various river basin, agro-economic, and industrial corridor plans in Mindanao.

Participants from key government agencies apply hydrological resource analysis modeling to river basins in the Philippines. Photo credit by B-LEADERS.

B-LEADERS and NWRB subsequently conducted a two-part workshop on hydrological resource analysis modeling for national authorities, which capacitated participants on the use of actual data, calibration of flow models, and application of results. The first part gave introductory lectures to other interested agencies that had not been able to participate in the first workshop in February. Held June 4–5, 2018, at Dolcelatte, Quezon City, the first workshop drew 24 new participants representing CCC, DA's Bureau of Soils and Water Management (BSWM) the Systems-Wide

Climate Change Office (SWCCO), DENR, DPWH, LLDA, NIA, NWRB, PAGASA, UPLB, and the LGU of Santa Rosa City. The second part of the workshop, which focused on in-depth model calibration, was conducted on June 6–8, 2018, at Xenia Hotel in Clark, Pampanga. It was attended by 41 participants from key government agencies such as CCC, DA, DENR, DPWH, LLDA, NIA, NWRB, PAGASA, UPLB, Santa Rosa LGU, NAMRIA, and DOE.

In follow-up support to Mindanao, another training session was organized on in-depth modeling calibration. Held at Infinity Suites in Davao City on September 24–25, 2018, the training was attended by 25 representatives of key government organizations involved in water resource management. The agencies represented were MinDA, DENR, NEDA, DPWH, and the different RBOs managing Davao, Tagum-Libuganon, Agusan, Cagayan de Oro, Tagaloan, Buayan-Malungon, and Mindanao river basins.

The third in a series of sessions to proceed with the integrative assessment of water, energy, and land use was held at Dolcelatte, Quezon City, September 27–28, 2018. This session focused on the presentation of case studies given to six breakout groups, which also provided a venue to plan for subsequent modeling activities. The 26 participants represented NWRB, DENR, CCC, DA-BSWM, PAGASA, NIA, LLDA, DPWH, NAMRIA, and LGU Santa Rosa City. The DILG, NEDA, Local Water Utilities Administration, and Metropolitan Waterworks and Sewerage System (MWSS) were also present to observe and learn about the hydrological resource analysis modeling tool. These capacity-building activities support the initiative of B-LEADERS and NWRB to jointly develop hydrological models, which will generate options to help build the Philippines' water security roadmap.

C. INTERFACE WITH THE *BOL*: MANAGEMENT, PLANNING, AND REGULATION OF THE WATER AND POWER SECTORS

The *BOL,* the *Organic Law for the Bangsamoro Autonomous Region in Muslim Mindanao*, aimed to abolish the ARMM and provide for the basic structure of government for the autonomous political entity called the Bangsamoro Autonomous Region. The *BOL* was established following the statements set forth in the Comprehensive Agreement on the Bangsamoro peace agreement signed between GPH and the Moro Islamic Liberation Front in 2014. During the review of the draft bill on the *BOL* in February 2018, B-LEADERS members served as resource persons to the Senate Committee on Energy headed by Senator Sherwin Gatchalian. The team provided comments on the proposed amendments to the *BOL*'s energy and natural resource provisions, specifically on the resolution of energy-related issues between the Bangsamoro government and the central government and on the importance of upstream-area governments recognizing the rights of governments in downstream areas when dealing with river basins flowing across different governmental units. B-LEADERS also provided a summary on the potential impact of the final version of the *BOL* on the water and power sectors in Mindanao. The *BOL* was signed as *RA 11054* on July 26, 2018, and took effect on August 10, 2018.

D. REGULAR INTERAGENCY MEETINGS AND SUSTAINED PARTNERSHIPS

Several bilateral and interagency meetings and consultations with concerned NGAs were conducted to ensure coordinated efforts for the WEFN. With NWRB in the lead, B-LEADERS offered TA in the form of a briefing on the salient features of the nexus study. Mindanao was the pilot area, and the study aimed at harmonizing water-related datasets, maps, and plans and providing economic tradeoff analysis based on the quantification of water demand against different scenarios. The overall output of this study will provide input to the Philippines' water security framework and roadmap through integrated water resource management. Upon recommendation of NWRB, CCC expressed interest in using the results of the nexus study to feed into NCCAP, which is currently being updated.

In September 2018, MinDA Executive Director and Undersecretary Janet Lopoz presented the WEFN Study for Mindanao: A USAID B-LEADERS Undertaking in Partnership with the Philippine Government at the Seventh WaterLinks Forum. Held September 25–27, 2018, in Pasig City, the international forum gathered representatives from 20 participating countries, which included water experts, policymakers, and various investors in the water sector. Meanwhile, NWRB Executive Director Dr. Sevillo David, Jr., presented in a parallel session the case of Angat Dam and its relevance to the need for information, collaboration, and public-private partnerships in the water sector. With the theme, "Solving Asia's Urban Water Crisis: The Water-Food-Energy-Climate Change Nexus," WaterLinks 2018 was designed to provide urban water managers and policymakers with insights on the interdependence of water, food, and energy in an uncertain but adverse climate environment, and the potential for developing and implementing integrated solutions to the water crisis in urban Asia.

Partners from NWRB and MinDA emphasize the contribution of the nexus study for both agencies to formulate appropriate policies. Photo credit by B-LEADERS.

The lessons learned from the nexus initiative were officially handed over to key partners to ensure that the relevant institutions would carry forward the project results. B-LEADERS partnered with MinDA and NWRB in sessions for the final output presentation and convening of partners. The first session, held at MinDA Office in Davao City on November 26–27, 2018, presented the final output of the study, its recommendations, and path forward. A total of 32 participants from key

government organizations involved in water resource management attended the session, including representatives from MinDA, DOE, DENR, NEDA Region XII, Regional Planning and Development Office of the ARMM, and the different RBOs in Mindanao. Two side events were also held—a refresher training on the use of the Hydrological Resource Analysis Modelling tool and the impacts of the *BOL* on energy and water management. The second event was held at Joy Nostalg Hotel in Pasig City on November 28, 2018, which drew 24 representatives from various national government organizations such as NWRB, DENR's Environmental Management Bureau (EMB) and Forest Management Bureau (FMB), DA's SWCCO, PAGASA, NIA, LLDA, DPWH, NAMRIA, DILG, MWSS, and the City Government of Santa Rosa.

Details on the Water-Energy-Food Nexus initiative are in Annex C.

SECTION 5: INSTITUTING A STREAMLINED PERMITTING PROCESS FOR ENERGY PROJECTS

When B-LEADERS began, the project recognized a key need to study the process of permitting for energy projects in the Philippines. Permitting has been a tedious process and, in 2014, DOE acknowledged the problem. DOE noted that at least 165 signatures were needed—from the village chiefs to department secretaries, and from various government agencies—before a project could break ground. This situation delayed, if not effectively prevented, the implementation of vital energy investments. Projects took 2 years or more to secure permits to begin construction, which was a significant disincentive for energy project developers. In response to this problem, B-LEADERS supported DOE's Investment Promotion Office (IPO) in developing EVOSS, which was specifically designed to help streamline the permitting process for energy projects (see ***Figure 9***).

EVOSS was designed to help streamline the permitting processes for energy projects. It helps strengthen the country's energy security by facilitating the development and implementation of new energy projects.

Figure 9. EVOSS infographic

A. EVOSS ONLINE PLATFORM AND DOCUMENT TRACKING SYSTEM

EVOSS initially featured RE projects during its soft launch in July 2015. The web-based system was designed to track and monitor the approval of energy project applications. The system was based on existing procedures and the respective citizen's charters of relevant agencies with prescribed timelines for permit issuances. In addition to providing sustained TA, B-LEADERS provided the hardware and relevant software licenses in 2016 for DOE to operate EVOSS. Supplementary to EVOSS, B-LEADERS supported the use of radio frequency identification (RFID) for its internal document tracking system. Various trainings and workshops were organized to build the capacity of concerned agencies.

EVOSS was launched on December 6, 2016, at Shangri-La Hotel, Makati City, during the Energy Investment Forum, after which the web-based monitoring system became operational. The launch was conducted in partnership with DOE. The event drew 318 participants from various sectors, including energy project developers, representatives of different embassies and consulates, civil society organizations, and government officials. DOE Secretary Alfonso G. Cusi emphasized that EVOSS will help make the application process more transparent and efficient, resulting in reduced transaction time and cost.

During the EVOSS launch, DOE Secretary Alfonso Cusi emphasized the critical role of a transparent and efficient permitting process in diversifying and increasing the energy supply of the country. Photo credit by B-LEADERS.

The RFID-based internal document tracking system was pilot-tested and institutionalized at DOE; as a result, the time to process a project application has been reduced from 45 days to 22 days. A feedback survey and FGD were conducted with project developers wherein the deployment of

EVOSS gained a net satisfaction rating of more than 85 percent. The survey and FGD also generated key recommendations on broadening the use of the system for conventional energy projects, further streamlining and consolidating signature requirements, and promoting the system to more project developers. Twenty-two RFID scanning stations were installed at various bureaus and offices of DOE involved in the permitting process.

B. HANDS-ON TRAINING SESSIONS AND CONSULTATIONS WITH EVOSS USERS

The project continued to support DOE-IPO in guiding primary users of EVOSS—the regulatory agencies and RE project developers—to fully use and benefit from the system. Focal persons from partner government agencies attended the hands-on training on April 17, 2017, with a special in-house session for key personnel from the Board of Investments on May 11, 2017. Meanwhile, representatives from solar, wind, hydroelectric, biomass, and geothermal power projects were trained on the use of EVOSS on April 19, 21, 24, and 25 and May 11, 2017, respectively. The series of hands-on trainings capacitated a total of 130 participants.

During the hands-on trainings, DOE-IPO Division Chief Ms. Lisa S. Go emphasized that the core of EVOSS is a complete, updated, and validated database. She encouraged participants to fill in project information to close the data gaps. The trainings also provided the opportunity for DOE to introduce the new features of EVOSS, guide participants in uploading project documents and editing basic project information, and solicit suggestions to further improve the user-friendliness of the platform. Systems enhancements were continued based on feedback and suggestions received from the stakeholders. IPO and B-LEADERS continued to assist users with EVOSS and to monitor their activities.

As of December 2018, 173 project developers were registered users of EVOSS, although DOE has a list of 800 awarded RE projects, whose project descriptions have already been uploaded in EVOSS online, to initially populate the database. Among the January 2018 list of projects, six are at least partly owned or run by U.S. entities/companies or have U.S. individuals as stakeholders. The list of beneficiary U.S. companies includes Astronergy Development Inc., Energy World International Ltd., Firmgreen Inc., Hydrocore Inc., Chevron, Smith Bell & Company Inc., Solexar Energy International Inc., and Liberty Trading/Navigation Co. ***Table 1*** summarizes the data per project type, and ***Table 2*** lists projects that are owned, operated, or financed in part by U.S. entities.

TABLE 1. NUMBER OF PROJECTS FINANCED, OWNED, OR OPERATED BY A U.S. ENTITY/COMPANY/INDIVIDUAL

Type of Power Project	No. of Project Developers with U.S. Owners/ Shareholders/Operators	Corresponding No. of Power Projects
Biomass	2	2
Solar	4	7
Geothermal	2	6
Hydro	8	21
TOTAL	16	36

U.S. = United States.

TABLE 2. LIST OF PROJECTS THAT ARE AT LEAST PARTLY FINANCED, OWNED, OR OPERATED BY A U.S. ENTITY/COMPANY/INDIVIDUAL

	Project Developer	Involved U.S. Entity	Project Name	Type
1	Agusan Power Corporation	One (1) U.S. shareholder	Lake Mainit	hydro
2	Astronergy Development Dipolog, Inc.	Astronergy Development, Inc.	Zamboanga del Norte Solar Power Project	solar
3	Astronergy Development GenSan, Inc.	Astronergy Development, Inc.	South Cotabato Solar Power Project	solar
4	Astronergy Development Mindanao, Inc.	Astronergy Development, Inc.	Misamis Oriental Solar Power Project	solar
5	Basic Energy Corp.	117 U.S. shareholders	East Manakayan Geothermal Project	geo
6	Basic Energy Corp.	117 U.S. shareholders	Mariveles Geothermal Power Project	geo
7	Basic Energy Corp.	117 U.S. shareholders	West Bulusan Geothermal Project	geo
8	Basic Energy Corp.	117 U.S. shareholders	Mabini Geothermal Project	geo
9	Constellation Energy Corporation	One (1) U.S. shareholder	Dupinga	hydro
10	Constellation Energy Corporation	One (1) U.S. shareholder	Alag Tributary 1	hydro
11	Constellation Energy Corporation	One (1) U.S. shareholder	Alag Tributary 2	hydro
12	Energy World Kanan River, Inc.	Energy World International, Ltd. (largest shareholder of Energy World Corp. Ltd.)	Kanan B-1	hydro
13	Firmgreen Phils. Inc.	Firmgreen, Inc.	Nueva Ecija Solar Power Project	solar
14	Firmgreen Phils. Inc.	Firmgreen, Inc.	Tarlac Solar Power Project	solar
15	Greenergy Solutions Inc.	Firmgreen International	Cordon Solar Power Project	solar
16	HPCo.	One (1) U.S. shareholder: HPCo. President and CEO Timothy Bennett	20.58-MW Biomass Cogeneration Plant	biomass
17	Hydrocore, Inc.	Hydrocore Inc.	Ibulao	hydro
18	Philippine Geothermal Production Company, Inc.	Chevron	Tiwi Geothermal Power Project	geo
19	Philippine Geothermal Production Company, Inc.	Chevron	Makban Geothermal Power Project	geo
20	Philippine Hybrid Energy Systems, Inc.	One (1) U.S. shareholder	Mag-asawang Tubig B	hydro
21	PHILPODECO	PHILPODECO is partly run by U.S. nationals	Palakpakin	hydro
22	PHILPODECO	PHILPODECO is partly run by U.S. nationals	Balugbog	hydro

TABLE 2. LIST OF PROJECTS THAT ARE AT LEAST PARTLY FINANCED, OWNED, OR OPERATED BY A U.S. ENTITY/COMPANY/INDIVIDUAL

23	PHILPODECO	PHILPODECO is partly run by U.S. nationals	Calibato	hydro
24	Smith Bell Mini-Hydro Corp.	Smith Bell & Company, Inc.	Commonal-Uddiawan	hydro
25	Smith Bell Mini-Hydro Corp.	Smith Bell & Company, Inc.	Matuno 1	hydro
26	Smith Bell Mini-Hydro Corp.	Smith Bell & Company, Inc.	Matuno 2	hydro
27	Solexar Energy International, Inc.	Solexar Energy International, Inc.	Tigbauan Solar Power Project	solar
28	SN Aboitiz Power - Benguet, Inc.	One (1) U.S. shareholder	Ambuklao	hydro
29	SN Aboitiz Power - Benguet, Inc.	One (1) U.S. shareholder	Binga	hydro
30	SN Aboitiz Power - Ifugao, Inc.	One (1) U.S. shareholder	Alimit	hydro
31	SN Aboitiz Power - Ifugao, Inc.	One (1) U.S. shareholder	Alimit-Pumped Storage	hydro
32	SN Aboitiz Power - Ifugao, Inc.	One (1) U.S. shareholder	Olilicon	hydro
33	SN Aboitiz Power - Magat, Inc.	One (1) U.S. shareholder	Maris Main Canal 1	hydro
34	SN Aboitiz Power - Magat, Inc.	One (1) U.S. shareholder	Maris Main Canal 2	hydro
35	SN Aboitiz Power - Magat, Inc.	One (1) U.S. shareholder	Magat	hydro
36	Victorias Milling Company Inc.	Liberty Trading/Navigation Co.	63-MW Bagasse-Fired Cogeneration Power Plant	biomass

CEO = chief executive officer; HPCo. = Hawaiian-Philippine Company; MW = megawatt; PHILPODECO = Philippine Power and Development Company; U.S. = United States.

During the hands-on trainings, DOE officials highlighted the efforts of the department in supporting the mandate of the government in streamlining permitting and licensing processes. They noted that DOE Department Order 2017-04-0005 prescribed new guidelines for processing applications for RE service/operating contracts. Officials also emphasized other important policies geared to support the online application system, which were then being formulated by the Office of the President and both Houses of Congress.

C. NATIONAL EVOSS POLICIES

An EO was then drafted to support national government efforts to harmonize, integrate, and streamline regulatory processes, requirements, and forms relevant to the development of energy investments in the country to uphold transparency and accountability among concerned agencies. The EO also supports the maintenance of a database of information and a web-based monitoring system for updates on project applications. The EO was signed on June 28, 2017, as EO 30.

EO 30 would further expedite the process of evaluating, approving, and implementing energy projects because energy projects are recognized as "projects of national significance." The EO established the EICC. EO 30's IRR was subsequently signed and approved by DOE Secretary Alfonso Cusi on April 25, 2018, and was issued as DC 2018-04-0013.

In addition to supporting DOE and other NGAs, B-LEADERS provided technical support to the Senate Committee on Energy concerning institutional, policy, and technical requirements of such a system. In his office's own assessment, Senator Sherwin T. Gatchalian, chairman of the Philippine Senate Committee on Energy, said that it takes 1,340 days to secure a permit for energy projects, requires 359 signatures for the permits to be signed, and involves 74 different agencies, including DOE. It was estimated that full implementation of EVOSS would cut the number of signatures needed from project application to groundbreaking and the number of days needed to secure approval and start projects.

EVOSS was further elevated to national importance when the Philippine Congress, comprising the Senate and House of Representatives, drafted laws that were acknowledged by the media as the country's landmark energy "anti-red-tape" bills. B-LEADERS provided technical support to the legislators so that EVOSS could be prioritized as a national legislative agenda. The project also supported DOE-IPO in unifying the NGAs' various application forms into a single EVOSS form.

On February 7, 2017, the Senate Committee on Energy led the first public hearings on Senate Bill No. 1439. The consultation aimed to solicit comments and position papers from various stakeholders on the proposed law, known as *An Act Establishing the EVOSS for the Purpose of Streamlining the Permitting Process of Power Generation Projects*. During the two hearings, Senator Gatchalian emphasized the current administration's drive to end red tape at various government agencies. He explained that a law supporting EVOSS would ensure continuity of the program despite political transitions, marshal support from other agencies, provide bases for penalties to noncomplying agencies, help promote competition in the industry, ensure dedicated financial support, and eventually reduce power costs.

On February 23, 2017, a meeting of the joint technical working group (TWG) on Energy and Finance Committees of the Senate was conducted to comprehensively review the bill, openly discuss contentious issues, and jointly agree on items to modify based on recommended changes and submitted position papers. The first draft earmarked PhP 50 million for initial implementation and stipulated that subsequent funds be included in the annual *GAA* of the government. B-LEADERS further supported DOE-IPO to itemize the resource requirements for EVOSS, including network design, server location, support to partner agencies, and capacity-building activities.

The initial deliberation of House Bill No. 4892 – *An Act Establishing the Virtual One Stop Shop for the Purpose of Streamlining the Permitting Process of Power Generation Projects* was held on August 8, 2017, followed by the first TWG meeting on September 22, 2017. Similar to the Senate proceedings, the House Committee on Energy, chaired by Lord Allan Jay Q. Velasco, solicited views, comments, and position papers from various stakeholders.

On November 22, 2017, the Senate approved Senate Bill No. 1439 on second reading. The *EVOSS Act of 2017* aims to significantly reduce the length of the permitting process for energy generation projects by establishing an online platform where prospective developers can apply, monitor, and receive all the needed permits and applications, submit all documentation requirements, and even pay charges and fees.

The House of Representatives approved its version of the *EVOSS Act* as House Bill 8417 on November 22, 2018. A subsequent Bicameral Conference Committee held on December 6, 2018, approved the reconciled version of the landmark *EVOSS Act*. The result was an increase in initial appropriation from PhP 50 million to PhP 100 million, further reflecting the national importance of EVOSS. The reconciled version of this landmark anti-red-tape measure requires all government agencies involved to follow a strict timeframe to act on pending energy applications. The failure of an agency to act within the prescribed timeframe will result in the automatic approval of said application and potential administrative sanctions levied against concerned public officers. On the other hand, private entities—the system operator and market operator—that fail to act within the prescribed timeframe will be fined PhP 100,000 (about USD 87,700) per day of delay. An average household consumption rate of 200 kW-hours per month was estimated; the Office of Senator Win Gatchalian, Chair of the Senate Committee on Energy, noted that because of the streamlining of the business/permitting process introduced through EVOSS, about USD 45 per Filipino household could be saved every year.

"Our most significant achievement [in partnership with B-LEADERS] is the development of the web-based system called the EVOSS, which aims to track energy applications in agencies involved in the approval of energy projects and the Energy Application Monitoring System (EAMS) which tracks energy applications in the various offices within DOE.

… The development of EVOSS and EAMS … will speed up the processing of the energy applications with limited interaction with office personnel.

… The involvement of the IPO in all the activities of the project, e.g., analysis of the process, data gathering, close coordination with the various entities involved, and continuous communication and feedback on the progress [have been our contributions to the partnership]." Ms. Lisa S. Go,
Chief, Investment Promotion Office, DOE. Photo credit by B-LEADERS.

SECTION 6: OVERALL RESULTS

B-LEADERS met its targets and completed its mandatory deliverables, but its overall accomplishments were more far reaching. The project implemented activities and approaches that produced meaningful outcomes beyond its initial mandate. The following narratives illustrate how the project, in 5 years, succeeded in catalyzing and bringing together the various stakeholders and their respective initiatives. The following section illustrates how project activities spanned one end of the development spectrum to the other—from local governments to national agencies and international fora; from forest areas to mangroves; from trainings, analytics, and tools to actual project implementation.

A. BUILDING LOCAL CAPACITY FOR MITIGATION ACTIONS

B-LEADERS was founded on building local capacities for LEDS, and ultimately demonstrating capacity strengthening by implementing—where needed and feasible—actual LED activities and projects.

During its period of implementation from February 1, 2014, to January 31, 2019, B-LEADERS strengthened its partnerships with GPH and its key partners to plan, design, and implement LEDS in support of the joint U.S. Government–GPH LEDS work plan. The project supported the Philippines' climate change programs and green growth strategies toward the development of NAMAs. In pursuit of this, the project focused on enhancing the capacities of the CCC, PLLENRO, and selected LGUs for LEDS analysis and implementation. Partnerships with other NGAs like DENR, DOTr, key academic institutions, and private sector organizations were also pursued to help build the capacities of LGUs.

In achieving one of the project's key objectives, *enhanced in-country capacity on LED,* B-LEADERS provided various trainings and workshops on GHG Inventory, Energy Efficiency Audit, and LCCAP, among others.

Through USAID's CDI, secondary and tertiary cities like Zamboanga, Tagbilaran, Cagayan de Oro, Batangas, and Iloilo City were supported in preparing their entity- and community-level GHG inventories and pursuing local climate change actions.

Customized technical support was given to specific CDI sites to optimize the project's assistance. For instance, B-LEADERS, with the support of local higher education institutions such as University of the Philippines (UP) Visayas, University of San Agustin (USA), and Central Philippine University (CPU), sustained its support to the Iloilo City government in updating the city's GHG Inventory for the base year 2015. Using the results of the inventory, Iloilo City designed a GHG Management Plan that helped identify specific mitigation measures. The efforts paved the way to passage of an ordinance offering an incentive—a 20 percent discount on real estate taxes—to

households using RE. In addition, the project helped the city promote ecotourism, launching a solar-assisted boat to ferry tourists from the heritage areas of the city to the mangrove areas of the river. Early in the program, the city promoted EE by switching to compact fluorescent lamps (CFL) to reduce emissions and, more recently, shifted from CFL to light-emitting diode lamps. Streetlights were retrofitted in the city and, together with GPH's retrofitting of lighting on national roads, a total energy savings of approximately 28 percent was achieved—this represents about 911 tons of carbon dioxide emissions avoided annually. The city has benefited greatly from these programs, gaining new knowledge and boosting its capacity to manage GHG emissions through the use of toolkits provided by the project.

After taking the lead in instituting EE measures, Iloilo City engaged the private sector and external stakeholders to adopt similar LED initiatives. Efforts to build the capacity of the private sector to conduct energy audits and techno-financial assessments are now paying off. Major institutions such as JBLFMU, Robinsons Place-Iloilo along with its sister company, GoHotel, and SM City Iloilo have already switched to solar roof power generation in line with the city's LEDS advocacy.

The tools and methodologies in the GHG Inventory Report and the GHG Management Framework Plan also helped another important CDI site, Batangas City, in preparing its LCCAP. Batangas City Government was able to identify climate risks, forecast GHG emissions, and institute a programmatic approach to implement activities, measures, and policy actions for climate change mitigation. The inventory also paved the way for the assessment of the carbon sequestration potential of mangroves in the city's coastal areas. GHG Inventory and Energy Audit workshops were organized for the city's 82 public elementary schools and 18 public high schools and local businesses, respectively.

The project also supported Tagbilaran City in completing its GHG Inventory for base year 2015. The inventory was conducted through the TWG of the Tagbilaran City Climate Change Committee (TCCCC), which is chaired by the City Disaster Risk Reduction Management Office (DRRMO) and is composed of representatives from the City Planning and Development Office, General Services Office, Solid Waste Management Office, and City Engineering Office, as well as from academia, the private sector, and DENR. Prior to conducting a community-level inventory, B-LEADERS supported the city in conducting an entity-level GHG inventory, which focused on specific segments such as city hall operations and activities. In this manner, LGUs gained an understanding of the GHG inventory process before engaging the rest of the city's stakeholders in the exercise. Eventually, a validation workshop for sectoral emissions inventory was carried out as part of the finalization of the city's community-level GHG inventory report. The sectors validated were the stationary and mobile sources of energy, solid waste and wastewater, agriculture, and forestry.

Covering national agencies as well as specific LGUs, the project also ensured involvement of regional bodies such as MinDA, the sole national government agency overseeing development efforts aimed at accelerating the socioeconomic development of Mindanao. B-LEADERS introduced its LEDS Mindanao Program and conducted various capacity-building activities, contributing to the achievement of mitigation plans and objectives. The partnership with MinDA, among other joint activities, enabled the City of Cagayan de Oro to complete its entity- and community-level GHG emission inventories for base year 2016. These inventories were carried out through the Cagayan de Oro GHG Team, which was composed of the city government; DENR;

academic institutions such as Xavier University-Ateneo de Cagayan, Capitol University, and the Mindanao University of Science and Technology; and the private sector, including Cagayan de Oro Chamber of Commerce and Industry and the city's local electricity distributor, Cagayan Electric Power and Light Company.

Similarly, in partnership with MinDA, the project built the capacity of the City of Zamboanga to complete its entity- and community-level GHG emission inventories for base year 2015. In the lead were Zamboanga's Office of the City Environment and Natural Resources and the Zamboanga City Airshed Governing Board (ZCAGB), respectively. Chaired by EMB Region IX, ZCAGB—which is composed of the LGU, DENR, and other NGAs, as well as academic institutions and stakeholders such as DA, Western Mindanao State University, Ateneo de Zamboanga University, and the city's sole distributor of electricity, the Zamboanga City Electric Cooperative—peer-reviewed and finalized the city's GHG emissions inventory reports (see ***Figure 10***).

Community-Level GHG Inventory Reports of the three CDI sites, namely, Tagbilaran, Cagayan de Oro, and Zamboanga City, were prepared with support from B-LEADERS.

Figure 10. B-LEADERS supported cities in building capacity to conduct GHG emission inventories

As part of its strategy to ensure sustainability, the project supported PLLENRO's advocacy in building the capacity of LGUs in developing, implementing, and supporting climate change mitigation policies, plans, and programs. PLLENRO created a Trainers Bureau composed of trained ENROs to conduct on-request trainings for LGUs. PLLENRO officers became trainers and held workshops and face-to-face mentoring on GHG accounting for its member LGUs. The league is now one of the accredited providers of GHG inventory trainings of the CCC, and is even being invited to train private institutions that are helping their respective LGUs promote LEDS in their communities.

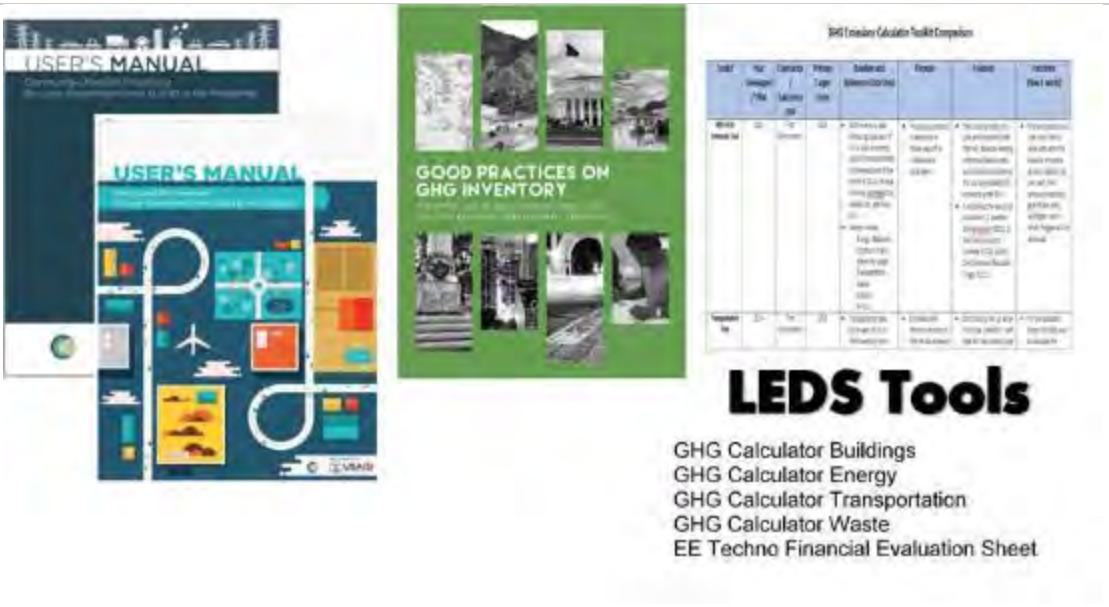
In total, the project has conducted GHG inventory training workshops for more than 400 LGUs nationwide. At least six community-level GHG inventory reports have been validated by a third-

party evaluator, and four of the six (Municipality of Kalayaan, Laguna, City of Makati, and Province of Aurora) have been validated and published.

Workshops on the development of the mitigation component of the LCCAPs were organized in partnership with PLLENRO and CCC. Workshops were conducted in Luzon, Visayas, and Mindanao, and culminated in Dumaguete City during PLLENRO's Annual National Convention in May 2017, which was attended by more than 500 environment officers, planning officers, and DRRMOs.

In support of national policies and frameworks, the project developed instructional materials such as the *GHG User's Manual* and spreadsheets and LEDS Toolkits (see ***Figure 11***). These tools provide step-by-step guidance in gathering, managing, and quantifying data and information about the level of GHG emissions and removal within respective jurisdictions. All materials were turned over to CCC and distributed to LGUs, NGAs, and other partner agencies.

B-LEADERS's climate change mitigation tools enable LGUs and partner NGAs to carry out assessments of the emissions in their regions of governance.



Knowledge products have been prepared with support from B-LEADERS and provided to partner NGAs and LGUs for upscaling and replication. Examples of these materials are community- and entity-level GHG emissions inventory users' manuals with spreadsheets, local good practices on GHG inventory, and customized LEDS tools.

Figure 11. Instructional materials on GHG emissions inventories and LEDS assessments




Participants of the various trainings developed through the strong partnership of B-LEADERS and PLLENRO. Photo credit by B-LEADERS.

B. STRENGTHENING CLIMATE-RESILIENT TOWNS

As B-LEADERS continued its work on CE, some pilot activities focused on developing Ecotowns. The purpose of these communities is to implement low-carbon pathways to economic progress and growth. Spearheaded by CCC, the Ecotown Framework aims to build adaptive capacities of communities and ecosystems by improving economic resilience and promoting ecological stability. The framework considers RE systems integral to community climate resilience.

In 2014, CCC spearheaded the crafting of the respective land use plans, energy programs, and climate-resilient strategies in the towns of Batanes and Siargao. At that time, both provinces were emerging tourist destinations. With the aim of ensuring that the environmental integrity of the ecotowns would not be damaged by the growing tourism industry, B-LEADERS supported the ecotowns in line with assistance to CCC's Ecotown Framework.

On April 7, 2015, B-LEADERS organized the ceremonial turnover of Batanes GIS maps and orientation on the Wind Resource Prospector and Geospatial Toolkit for the LGUs in Batanes. The

GPH-U.S. Government delegation to Batanes was led by CCC Secretary Mary Ann Lucille Sering and USAID Philippines Mission Director Gloria Steele, who turned over the GIS maps to Batanes Governor Vicente Gato, Congresswoman Henedina Abad, and representatives from the six LGUs of Batanes (Basco, Ivana, Mahatao, Uyugan, Sabtang, and Itbayat). The GIS maps provided to Batanes include elevation maps, land cover maps, political boundary maps, slope maps, and soil maps. The maps can be used in the development plans of the Province of Batanes and its municipalities.

CCC Secretary Sering and then-USAID Philippines Mission Director Steele turned over the Batanes GIS maps to Congresswoman Henedina Abad, Governor Vicente Gato, and representatives from the municipalities of Basco, Ivana, Mahatao, Uyugan, Sabtang, and Itbayat. Photo credit by B-LEADERS.

Secretary Sering and Assistant Secretary Joyceline Goco of CCC highlighted how the maps can help Batanes in assessing its resources and formulating a development plan. During the turnover, B-LEADERS conducted an orientation on the Wind Resource Prospector and Geospatial Toolkit for LGU representatives of Batanes. Both tools were developed by the U.S. DOE and NREL in coordination with key GPH agencies such as CCC, DOE, and DENR's NAMRIA in support to the Philippines' RE roadmap. The tools will guide LGUs in defining potential RE sources that can be harnessed and incorporated into the energy supply.

During her speech, Secretary Sering emphasized how the Wind Resource Prospector can assess wind resources and encourage investments in wind technology in Batanes. Secretary Sering—who also hosted a television program at Net25, called *Klima ng Pagbabago* (*Climate of Change*), featuring climate change relevant topics—documented the unique agricultural practices, culture, and unspoiled environment in Batanes. Congresswoman Abad emphasized that Batanes is the only province in the Philippines that is wholly categorized as a protected area. The Province of Batanes is seeking to be included on the United Nations Educational, Scientific, and Cultural Organization's World Heritage List for its landscapes and seascapes.

In 2015, CCC Secretary Lucille Sering and B-LEADERS led the RE technology briefing with the board and management of Siargao Electric Cooperative (SIARELCO). The briefing covered possible contractual modalities in augmenting the power supply in Siargao using RE. The options included an RE power agreement with the National Grid Corporation of the Philippines or a bilateral PSA with an RE developer.

Both Ecotown activities with CCC were concluded in 2015.

B-LEADERS and CCC presented options for contractual modalities to SIARELCO General Manager Sergio Dagooc. Photo credit by B-LEADERS.

C. STRENGTHENING LOCAL GOVERNMENTS AS CHAMPIONS OF ENERGY EFFICIENCY

B-LEADERS strengthened its partnerships with the U.S. Government's CDI sites, Batangas City, Iloilo City, Tagbilaran City, and Mandaue City. The partnerships focused on promoting various mitigation activities such as EE and green building initiatives. The project's strategy was to consider the CDI LGUs as targets for initiating and implementing LEDS, particularly EE measures.

With the support of the project, Iloilo City completed its GHG Inventory. The city used the inventory to determine that the major sources of emissions are energy and electricity use. This helped the city formulate a management plan and eventually take the lead in instituting EE initiatives. In February 2015, B-LEADERS supported Iloilo City as it engaged private sector and external stakeholders to adopt EE measures by conducting energy audits and technical/financial assessments of technology options. A second round of EE Workshops and Walkthroughs for a new batch of private sector organizations followed in March 2017. New energy projects were designed and implemented as a result of these capacity-building activities.

For example, JBLFMU is the first university in Western Visayas to implement a solar PV rooftop system. Despite being small scale, at 70 kilowatt peak (kWp), the system generates monthly savings of about USD 500 and reduces GHG emissions by more than 45.36 $mtCO_2e$ annually for the school. The university also installed light-emitting diode lamps, and is saving about USD 3,000 on electricity costs per year.

Robinsons Place Iloilo, a workshop participant and one of the most popular malls in the city, installed 2,315 units of solar PV modules. The system generates savings of about PhP 9 million per year (or PhP 26,000 per day) and reduces emissions by more than 362.87 $mtCO_2e$. The company is continuously retrofitting with light-emitting diodes, which is now saving 68 percent of energy costs and reducing emissions by 83.46 $mtCO_2e$ annually. Ms. Kristin Hortelano, the mall's operation manager, gave a presentation on the mall's involvement in Iloilo City's LEDS initiatives spearheaded by the city ENRO in partnership with B-LEADERS.

In December 2016, SM City Iloilo, another major mall and an active participant in the project's workshops, won two awards for its EE initiatives during the 2016 Don Emilio Abello Energy Efficiency Awards ceremonies. SM City Iloilo won the Outstanding Mall Award and Energy Manager Award for achieving 8.5 percent production energy savings (or 478,076 liters of oil equivalent), which translates to PhP 16,684,852 in annual cost savings and yearly emissions reduction of 937.84 kilograms of carbon dioxide equivalent (CO_2e).

Batangas City also advanced EE as it introduced the entity-level GHG inventory and energy audit to 150 representatives of business establishments and private organizations in April 2016. Following the basic training, an Energy Audit Walkthrough was organized with the Metro Batangas Business Club (MBBC) and the engineers and staff of Pontefino Hotel and Residences. Pontefino served as a demonstration site committed to using energy-efficient appliances to save electricity and lower carbon emissions.

In February 2017, the first three modules on the EE and Energy Audit Program were introduced during GHG Inventory and EE Trainings for Tagbilaran's Private Sector Partners. The session was complemented by an Energy Audit Walkthrough. During the workshop, participants learned techniques for establishing business load profiles and negotiating with retail electricity suppliers. In March 2017, the Second EE and Energy Audit Workshop discussed the elements of a power bill and presented an overview on assessing the efficiency of electrical and thermal systems in buildings. During the workshop, the participants computed the potential cost savings using actual data from their respective establishments.

B-LEADERS also supported Mandaue City in further articulating local policies that promote green building practices and investments. Since the start of the project, Mandaue City hosted a series of stakeholder consultations and discussions on green buildings. With assistance from the project, Mandaue City conducted green building site visits and briefings. After a process of consensus-building, the Mandaue Green Building Code was approved in October 2015 and duly enacted in November 2015 in the form of Ordinance No. 13-2015-1047. The ordinance became the city's anchor policy on green buildings and sustainable development.

Although Mandaue successfully passed its green building ordinance, much remained to be done in terms of implementation. The project continued to help the LGU build the capability of internal and external stakeholders to support effective implementation of the ordinance. As part of capacity building for Mandaue City, the project helped develop the Green Building Rating System. The activity also included a writeshop for the Green Building Code's IRR, Investment Package, and Toolkit. These activities were designed to aid the process of implementation and help affected stakeholders comply with the local ordinance. The IRR was later issued by the city council in May 2016 in the form of *EO 2016-17,* and the Investments Package was also released during the same month.

In 2017, Iloilo City followed suit in developing a local code for green buildings. A series of FGDs was supported by the project to guide Iloilo City in drafting comprehensive provisions and parameters for the code. In February 2017, the city brought together Architect Araceli Barlam of Mandaue City ENRO, Architect Marlo Ocleasa of Mandaue City Planning and Development Office,

and Mr. Oliver Gonzales of Batangas City ENRO, who shared their experiences, success stories, and challenges in drafting and implementing green building ordinances.

In May 2017, a second round of discussions was attended by Iloilo City ENRO, City Engineer's Office, and experts from partner academic institutions. Architects Michaela Rosette Santos from the United Architects of the Philippines and Christopher de la Cruz from the Philippine Green Building Council were the resource speakers. They discussed the Philippine Green Building Code and how to establish a certified green building rating system that is appropriate for the city. The city is now moving toward drafting specific provisions for the Iloilo City Green Building Ordinance, which will consider criteria such as EE, water efficiency, materials and waste management, sustainable indoor air quality, and building design.

These initiatives demonstrate how local governments can initiate and influence climate change mitigation actions at the local level. These city-led examples help promote EE and resource conservation.

D. DEVELOPING MANGROVE FORESTS AS POTENTIAL CARBON SINKS

During the project's base period, B-LEADERS worked with NGAs, LGUs, the private sector, and other stakeholders in improving the conservation and management of natural resources such as mangrove forests. These forests are crucial to the ecosystem. They provide biodiversity habitat and offer livelihood opportunities that are aimed at managing the causes and impacts of climate change. Mangrove ecosystems also help mitigate the negative effects of climate change because they act as reservoirs for carbon emissions and serve as buffer zones for storm surges in many coastal communities.

The Philippines faces threats to mangrove survival and the loss of countless ecosystem benefits if deforestation and degradation are not abated. Many LGUs recognize the ecological value of mangrove forests, but local decisionmakers and stakeholders have yet to design effective resource management plans to conserve their remaining mangroves. Accounting and valuation of the mangroves' potential carbon stocks can help rationalize the need for rehabilitation and sustained forest protection.

From 2015 to 2017, the project supported CDI sites, namely, the cities of Iloilo, Batangas, and Zamboanga, with assessments in mangrove areas. B-LEADERS assisted with baseline studies on the carbon stock and carbon sequestration potential of mangrove forests in the cities. The mangrove baseline studies had three components: 1) mapping of mangrove forests, including assessment of species composition and community structure, to determine coverage; 2) calculation of the total amount of carbon stored in aboveground biomass (AGB) and belowground biomass (BGB) of mangroves; and 3) collection of soil/sediment samples and measurement of the stored organic carbon across the soil profile where the mangrove forest is located.

Based on internationally accepted protocols, the baseline studies were undertaken by selecting patches of mangrove forests and projecting their data to produce estimates for the entire area. This methodology estimated the 1) total tons of mangrove biomass; 2) total carbon stored; and

3) $mtCO_2e$ sequestration potential. Nondestructive sampling was done, and allometric estimation models were used to compute carbon stocks.

(Upper left) Mapping the sampling sites to be covered by the study (Iloilo City). (Upper right) A student from The Western Mindanao State University measures the diameter of a mangrove tree to determine biomass (Zamboanga City). (Lower left) Using a soil auger, soil samples are collected for laboratory analysis of sediment carbon content (Zamboanga City). Photo credit by B-LEADERS.

In Iloilo City, coastal mangroves along the Iloilo Strait as well as in Batiano and Iloilo Rivers have a combined area of 132.24 hectares (ha) and a total mangrove biomass of 25,326 tons. If both the carbon stored in the biomass and soil organic carbon were considered, the total carbon sequestration potential of all the mangroves in Iloilo City is 255,664 $mtCO_2e$—about 83 percent of which is attributable to mangrove sediments. In Batangas City, 26.48 ha of mangroves in its six barangays account for 5,190 tons of biomass; the total carbon sequestration is 29,921 $mtCO_2e$, of which 71 percent is attributable to the sediments. Meanwhile, only the mangroves in Barangays Mampang and Talon-talon in Zamboanga City have been investigated, yet these two sites alone are home to 857 ha of mangroves or 44,351 tons of biomass, with total equivalent sequestration of 1,973,087 $mtCO_2e$, comprising more than 96 percent contribution from mangrove sediments.

On a per-ha basis, the total ecosystem sequestration potential (sum of contributions from AGB, BGB, and soil/sediments) in Iloilo is 1,753.59 $mtCO_2e$/ha; about 1,025.12 $mtCO_2e$/ha for Batangas City; and 2,088.34 $mtCO_2e$/ha for the mangroves in Mampang and Talon-talon, Zamboanga City. It must be pointed out that, although Zamboanga's total sequestration per ha is highest, the contribution of its mangrove biomass is quite low, at around 82 $mtCO_2e$/ha because of the abundance of smaller, younger trees that were planted at the two sites in 2014. In contrast,

mangroves in Iloilo and Batangas have similar sequestration potential of about 330 $mtCO_2e$/ha, due to their biomass.

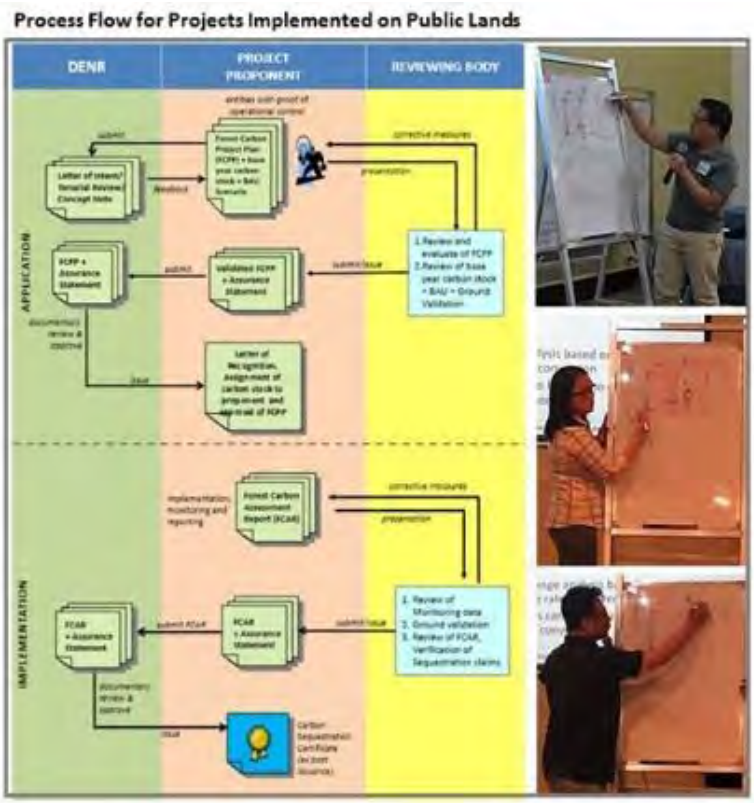
For all three cities, the carbon sequestration potential is 2,258,670.88 $mtCO_2e$ or 2,224 $mtCO_2e$/ha wherein a weighted average of 94.6 percent is due to sediment carbon. The 2.26 million $mtCO_2e$ of sequestration potential equals taking about 483,655 gasoline-powered cars off the road in a year, switching 75.6 million incandescent lamps to light-emitting diode bulbs, or growing more than 58.5 million tree seedlings for 10 years.

Trainings were conducted for the LGU partners. On January 25–26, 2017, the Batangas Mangrove Study team presented the results of the study to the Batangas City LGU, schools, and private partners. The team also held a capacity-building workshop to equip the partner city in conducting future studies. For Zamboanga City, the training was held before the study was conducted. On March 15–16, 2017, a workshop was conducted to train the students and the city ENRO, who will join the team in gathering data for the study. The workshop was also attended by MinDA. Results of the Iloilo study were presented by Dr. Resureccion Sadada during the Clean Air Month Culmination event during the LEDS session on November 29, 2017. Dr. Sadada highlighted the potential of mangroves as carbon sinks and stressed the importance of protecting and rehabilitating mangrove forests.

The study will contribute to the cities' future plans to develop policy instruments, laws, and other strategies that can support the conservation of their current forest covers, thereby helping sequester and reduce carbon emissions in these cities.

E. PROMOTING FORESTRY-RELATED MITIGATION INVESTMENTS AND ACTIVITIES

In keeping with its holistic perspective on climate change mitigation, B-LEADERS also looked into LEDS opportunities in the forestry sector. Pursuant to DENR *EO No. 193, series of 2015*, which involved expanding the coverage of the National Greening Program (NGP), the project explored how an estimated 7.1 million ha of unproductive, denuded, and degraded forestlands could mitigate the effects of environment-related risks such as soil erosion, landslides, and flooding.



A careful review of the process of project development in public lands enables stakeholders to identify appropriate interventions for improvement.

Figure 12. Process for implementing projects on public lands.

To help accelerate the rehabilitation and reforestation of these areas, the government sought to attract participation and investment from the private sector. Representatives from the private sector led by the Philippines Business for the Environment (PBE) worked with DENR to create a system that recognizes industry engagement in reforestation and forest protection (see ***Figure 12***). The scope and purpose of such a system were discussed, including the potential alignment with NGP.

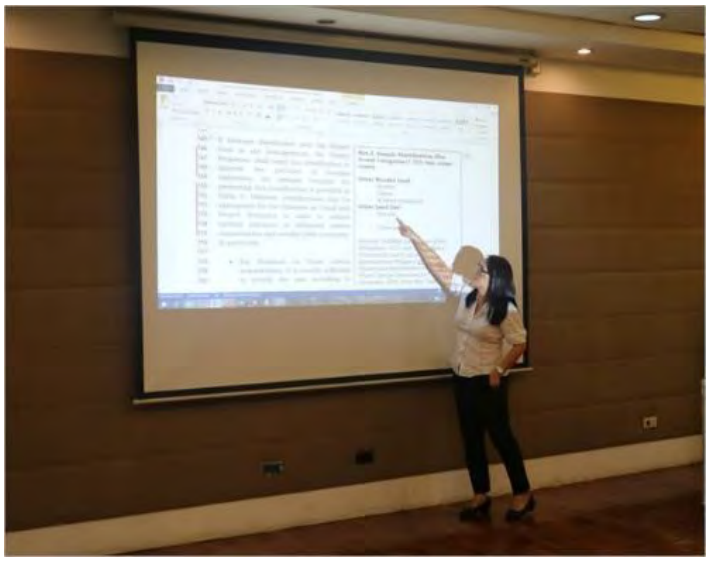
As a result, FMB and EMB started drafting a Department Administrative Order (DAO) that establishes a CAVCS for the Forestry Sector. During the last quarter of 2016, at the request of DENR, B-LEADERS helped develop a registry for tracking, verifying, and certifying carbon sequestration projects. The main objective of this effort was to encourage private sector investment in projects that sequester GHGs by providing verified CSCs that a company can use to demonstrate its commitment to forest protection and afforestation/reforestation.

After a series of consultation meetings among FMB, EMB, and B-LEADERS, a Joint Technical Bulletin (JTB) was determined to be the logical first step to expedite the activities. The JTB will gradually upgrade to a DAO as implementation activities roll out.

On October 26, 2016, the FMB Director, Ricardo Calderon, met with representatives from EMB, PBE, and B-LEADERS. The need to implement a system that is simplified, streamlined, and flexible for Philippines-specific standards was reiterated. The group agreed to set up an internal interim TWG consisting of relevant DENR bureaus and private sector representatives to work on the policy instrument. The TWG was supported by the Technical Secretariat, which comprised technical staff from the same agencies of TWG. On February 2 and 13, 2017, the planned activities and timelines were vetted by government partners.

On June 6, 2017, a workshop drew 28 representatives from the private sector, CCC, Technical Secretariat, and B-LEADERS. After a series of technical presentations by CCC, PBE, and B-LEADERS, a set of fundamental questions was presented to guide the participants during the FGD. The discussions focused closely on the technicalities of CAVCS, with due consideration to local experience and international best practices.

A follow-up writeshop was carried out on July 18–20, 2017, at Widus Hotel, Clark Freeport Zone, Pampanga, to formulate the policy document and supporting technical guidelines, which outlined the relevant technical requirements, processes, and institutional arrangements. The activity built on earlier consultations with the private sector and provided a venue to discuss specific issues such as principles of additionality, factors to consider in project-based GHG accounting, non-GHG criteria, project ownership, baseline scenario, project monitoring, principles of permanence, leakage, verification, and choice of policy instrument. Many of the issues raised under each salient point item were extensively discussed and resolved. Unresolved items were delegated either to DENR's TWG and Technical Secretariat or the B-LEADERS Team. The draft policy instrument (i.e., the JTB) was completed and delivered to DENR for another round of review.



Ms. Edna Nuestro, Division Chief of FMB's Forest Policy, Planning, and Knowledge Management Division, discusses how to make forest and non-forest categories of CAVCS consistent with DENR's laws and policies. Photo credit by B-LEADERS.

A similar writeshop was held on September 11–13, 2017, at Widus Hotel, Clark Freeport Zone in Pampanga, to finalize the JTB and its annexes or technical guidance.

On November 27, 2017, 11 representatives from DENR's FMB and EMB participated in the final workshop, which was held at Dolcelatte, Quezon City. The participants revisited the main policy document, which will be in the form of a Joint FMB-EMB Technical Bulletin, and vetted on the latest version of the Technical Annexes. The participants also reviewed the contents of proposed CAVCS templates, including the boilerplate application form, concept note, assurance statement, and CSC. B-LEADERS experts continued detailed discussions with FMB personnel on November 28–29, 2017, to finalize the guidance documents and templates.

In addition to CAVCS, a forestry-related project that B-LEADERS supported was Iloilo City's analysis of the value chain of charcoal. Charcoal is an important fuel for cooking and grilling in households and commercial establishments in the city. The study was done to assess charcoal production, trade, and consumption by identifying the sources and key market players. The surveys reported that 70 to 80 percent of the charcoal consumed in Iloilo City is produced in the nearby

province of Guimaras. The surveys also found that the transporters and retailers earn more from the charcoal than the charcoal producers. It was recommended that DENR-Provincial ENRO and the respective LGUs act together to implement short- and long-term interventions, such as the practice of sustainable charcoal production, to ensure that cheaper forms of energy are available to consumers (particularly low-income households) while considering the impact of charcoal production on the environment.

F. OPTIMIZING ANALYTICAL TOOLS FOR CLIMATE CHANGE POLICY AND PROGRAMMING

As the Philippine economy continued to expand, GPH promoted various initiatives that address the sustainability and GHG emission challenges that emerge with sustained growth. As part of this effort, CCC partnered with USAID through B-LEADERS to carry out a CBA of climate change mitigation options. An economy-wide CBA is a systematic and transparent process that can be used to evaluate the impact of potential government interventions on the welfare of a country's citizens. At the onset, the CBA study was geared toward the identification of socially beneficial climate change mitigation opportunities in the Philippines and its inclusion in the INDC submitted by the Philippine government to the UNFCCC on October 1, 2015.

In 2014, the United Nations Development Programme (UNDP), in cooperation with CCC, developed a list of mitigation options for the waste, industry, transport, and agriculture sectors of the country. These options were to become part of NAMAs. At the request of CCC, B-LEADERS built on the mitigation options listed in the UNDP study. The CBA was then done for specific mitigation options, technologies, or processes that can be individually quantified, monetized, and compared for cost effectiveness.

The CBA study covered GHG-emitting sectors in the Philippines, including energy, forestry, industry, transport, and waste. The assessment's baseline projection period was 2010–2050 for sector-specific GHG emissions levels. The evaluation of the mitigation options covered the period of 2010–2050.

B-LEADERS ensured that the CBA was broad based and inclusive. Inputs were gathered from the energy; transport; agriculture, forestry, and land use; solid waste; wastewater; and industrial processes and product use (IPPU) sectors. The inputs helped improve the data sets used for projecting business-as-usual scenarios from 2000 through 2050 and identify additional measures to reduce GHG emissions.

B-LEADERS consultant, Ms. Emily Ghosh, explains to the participants how to update the CBA LEAP model during the technical working sessions of the workshop. Photo credit by B-LEADERS.

As part of USAID's thrust to enhance in-country capacities of institutions in climate change analysis, B-LEADERS conducted a series of trainings for all the relevant sectors. The CBA study used two basic analytical tools in building local capacity; these tools are now being used by the partners as follows:

- Long-range Energy Alternatives Planning (LEAP) Tool – LEAP is a versatile software used for optimizing energy demand and supply and for modeling mitigation technologies and policies across the energy and transport sectors. It can also be used for other sectors.
- Agriculture and Land Use (ALU) Greenhouse Gas Inventory – A software for GHG inventory that takes into account emissions and removals related to agriculture, land use, land-use change, and forestry activities.

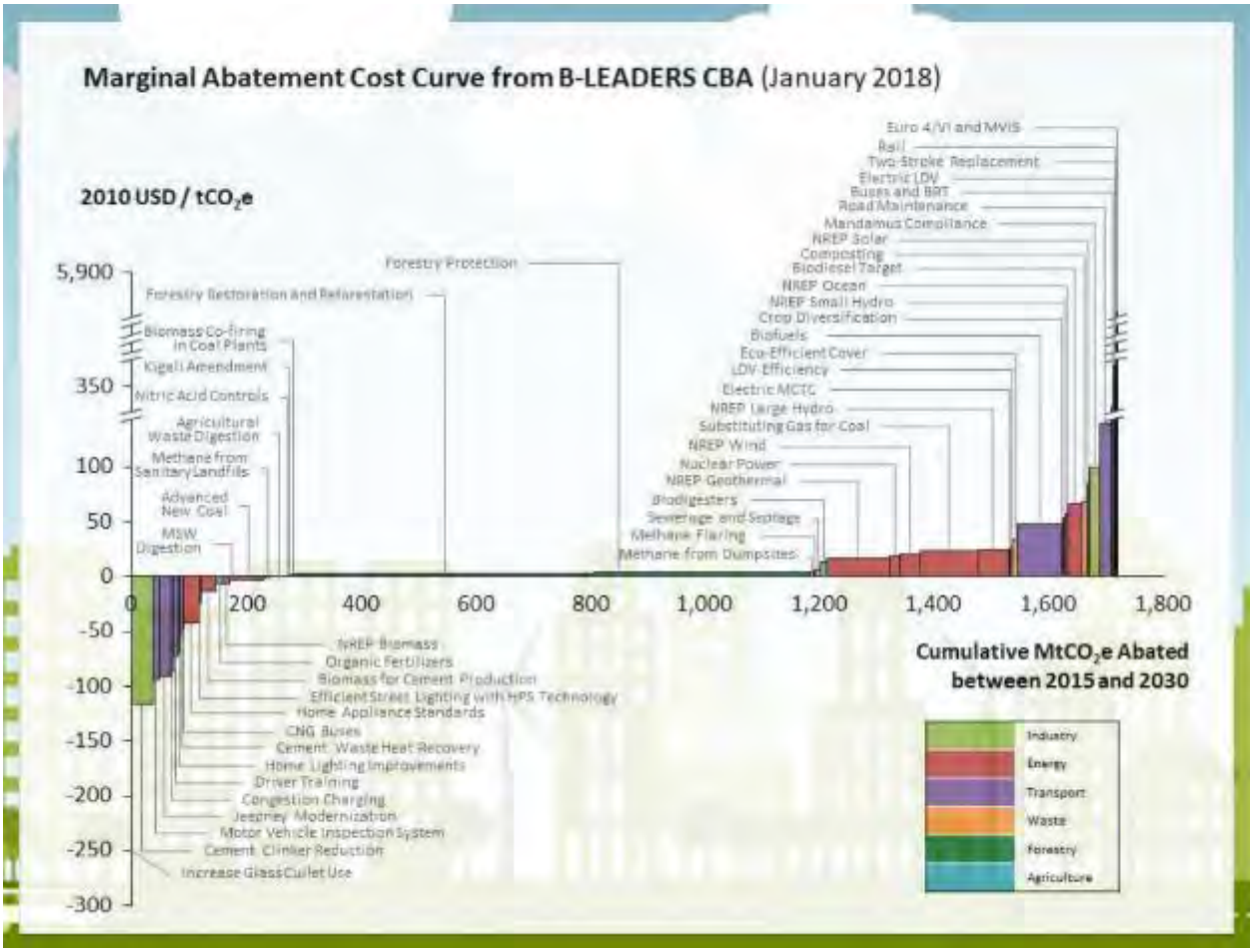
In addition, six sector-specific assessment tools were developed during the study. The tools were as follows:

- CBA Mitigation Toolkit: LEAP-based Integration Tool,
- CBA Mitigation Toolkit (IPPU),
- CBA Mitigation Toolkit LEAP (Energy),
- CBA Mitigation Toolkit LEAP (Transport),
- CBA Mitigation Toolkit (ALU) MS Excel-based Worksheet, and
- CBA Mitigation Toolkit (Solid Waste) MS Excel-based Worksheet.

Key NGAs were trained to use the tools so they could navigate and generate results from the model's interface.

In a letter addressed to USAID dated July 13, 2017, CCC requested that B-LEADERS update the numbers based on the current priorities and targets of the government. During the trainings,

participants vetted the data to improve the country's quantitative information base on climate change mitigation, which is part of the Enhanced Mitigation CBA Study (see ***Figure 13***).



The Marginal Abatement Cost Curve visually illustrates the cumulative abatement potential and cost per ton if all the mitigation options are implemented. It shows that implementation of all the mitigation options analyzed in the study could result in emissions reduction of 186.2 mtCO2e in 2030 compared with the baseline scenario.

Figure 13. Potential carbon abatement if all mitigations measures are used

B-LEADERS continued to support CCC in updating the NCCAP and the NDC by looking into the WEFN within the context of the thematic priority areas of GPH.

G. ENABLING POLICIES FOR SUSTAINED RENEWABLE ENERGY DEVELOPMENT

On December 16, 2008, *RA 9513,* the *Renewable Energy Act*, was signed into law. The law was enacted to promote the development, utilization, and commercialization of RE resources and other indigenous sources of energy. The law created NREB to ensure that its policies would be executed. The accompanying policies and IRRs would have to be formulated and issued to fully implement the law. During the past 5 years, B-LEADERS has worked with DOE through NREB to conduct a series of public consultations for supporting policies under the RE law: RPS On-Grid and Off-Grid Rules, the REM Rules, and GEOP.

NREB Chairman, Atty. Jose Layug Jr., delivers a keynote speech to stress the importance of cooperation from both the government and energy sector stakeholders to reach the goal of 35 percent RE share by 2040. Photo credit by B-LEADERS.

The public consultations presented the latest draft of the policies and comments and suggestions received from the stakeholders in the energy sector. The policies were then formally endorsed to Secretary Alfonso Cusi. A total of 17 consultations were held across the country for all the policies mentioned.

RPS on-grid public consultations were held in Cebu, Davao, and Manila in July and August 2017. The stakeholders supported the policy and raised concerns regarding only proper compliance and basis of the annual increment calculations. The implementation of the RPS on-grid rules will mandate all DUs to source a portion of their energy from renewable sources accompanied by an annual incremental increase of not less than 1 percent. DOE subsequently issued DC 2017-12-0015 promulgating the rules and guidelines governing the establishment of RPS for on-grid areas.

In addition, public consultations for RPS off-grid rules were held in Puerto Princesa City, Batangas City, Cebu City, and Cagayan De Oro City in October and November 2017. The enforcement of RPS rules for off-grid areas is expected not only to promote RE growth in the country but to improve energy self-sufficiency in off-grid sites. The RPS rules for off-grid areas will also rationalize the use of the Universal Charge for Missionary Electrification.

In addition to the RPS rules for on-grid and off-grid areas, GEOP will help empower end-users with options to choose RE sources for their respective energy needs. This policy extends the power of choice to end-users in the captive market. Under the GEOP rules, consumers can ask their respective DUs or ECs to provide them with an RE supply, and large power users can directly enter into contracts with RE generators or suppliers. The public consultations for GEOP were held in Bacolod City, Davao City, and Manila City in September 2017. On July 18, 2018, DC 2018-07-0019: Promulgating the Rules and Guidelines Governing the Establishment of the GEOP Pursuant to the *RE Act of 2008*, was signed by DOE Secretary Alfonso Cusi.

With the policies in place, a mechanism to monitor the compliance of the mandated participants became even more essential. Thus, the REM rules were established. REM provides for the trading of Renewable Energy Certificates (RECs). RECs are earned through compliance with the RPS rules. The RE Registrar will be responsible for issuing, keeping, and verifying the RECs issued corresponding to the energy generated from eligible RE facilities. The project supported three public consultations on the draft REM rules held at Davao City, Manila, and Cebu City in December 2017.

DOE and NREB continue their efforts to produce an efficient and climate-resilient grid for the Philippines. Photo credit by B-LEADERS.

With support from the project, the policy mechanisms completed the public consultations needed for endorsement to the Secretary. The policies will also contribute to the national goal of reaching the 35 percent share of RE in the country's energy mix by 2040. All public consultations were spearheaded by DOE and NREB with support from B-LEADERS.

H. ADVANCING CLIMATE-RESILIENT REGIONAL ENERGY DEVELOPMENT PLANNING

The energy infrastructure of the Philippines is highly vulnerable to natural and human-induced disasters. The national government, particularly DOE, recognized the threat and identified critical gaps in preparedness planning and tools at both national and local levels of governance. Mobilization on initiatives for resilience began in 2014 in the aftermath of Typhoon Haiyan in the Visayas. B-LEADERS worked with DOE, NEA, Philippine Rural Electric Cooperatives Association, Inc. (PhilRECA), and various ECs in advancing climate-resilient planning.

Visayas Regional Planning. The project conducted workshops for DOE on the use of LEAP. LEAP is a flexible software used for optimizing energy demand and supply and for modeling mitigation technologies and policies across the energy and transport sectors. It can also be applied to other sectors. In 2015, after a series of workshops, DOE started crafting the Visayas Energy Model as part of the Visayas Energy Plan. The project provided assistance in the technical consultations held in Manila and Cebu City to discuss the econometric theory behind the inputs and to look at the overview of the key data sources and assumptions used in the model. The project further assisted DOE in drafting the Visayas Energy Outlook, and conducted a review of the regional energy plans for Regions 6, 7, and 8. DOE has emphasized that local stakeholder ownership must be built into local energy plans, and that the plans need to model each region's thrust in implementing mitigation actions.

Energy Resiliency Policy Guidelines. The project also sustained its support to DOE in a series of public consultations on the draft DC on energy resiliency planning and programming in the energy industry sector. The series was completed in 2017. The consultations were attended by a total of at least 195 participants composed of energy stakeholders representing LGUs, NGAs, consumers, DU, ECs, transmission operators, generation companies, energy resource developers, and academia, through the regions of Luzon, Visayas, and Mindanao. Feedback, recommendations, and comments were gathered. Key issues involved the harmonization of policies and clarification of roles, harmonization of resiliency plans and practices, development of redundancy measures, implementation of mitigation measures, and mobilization of finance and investments. The policy was subsequently issued by DOE as DC 2018-01-001, Adoption of Energy Resiliency in the Planning and Programming of the Energy Sector to Mitigate Potential Impacts of Disasters.

Climate-Resilient Distribution Code Standards. B-LEADERS worked with DOE and NEA in reviewing and updating the country's power distribution design and construction standards. The main goal of this support was to help the country design climate-resilient power distribution systems in view of the increasing frequency, intensity, and unpredictability of typhoons. The project supported a study entitled Development of Climate-Resilient Distribution Construction Standards to review the performance of existing distribution line standards in high wind conditions. The initiative began in 2014 in assessing the damage caused by Typhoon Haiyan in the Visayas in late 2013. The typhoon was considered to be the strongest in the world ever to make landfall. Haiyan killed more than 6,000 people and damaged the distribution facilities of 33 ECs.

B-LEADERS helped organize consultations and FGDs to solicit comments and suggestions for the enhancement of the proposed climate-resilient distribution design standards. Key participants and experts in attendance included officials and technical personnel from DOE, ERC, PhilRECA, and ECs all over the country, some of whom came from regions most affected by typhoons and other natural disasters. The workshops provided a venue for EC personnel to share field experiences and for project experts to train participants on evaluating the capacities of their distribution lines to withstand high winds and extreme weather events.

GtG Project. As countries around the world establish more ambitious targets for the integration of variable renewable energy (VRE) resources such as solar and wind, power system operators and planners will need to evaluate and manage the impact of these VREs on existing systems such as

transmission and market operations. USAID, NREL, and DOE, together with various power sector stakeholders, held a series of scoping meetings in April 2015. The participants determined that a grid integration study for the Philippines would be a key element in strengthening the capacity of GPH and system planners and operators to address the constraints of integrating more VRE resources into the grid. With this, B-LEADERS provided NREL and DOE with in-country support to conduct the GtG integration study. The study provided resources and guidance to local energy stakeholders in assessing the impact of increasing VRE resources in the system and addressing the constraints and challenges that come with it.

The study examined the impacts of the country's growing RE targets and assessed actions that can cost-effectively improve the integration of VRE sources into the grid. The study identified potential grid reliability concerns in the local context and identified options to improve system flexibility and balance. A critical element of this study was the engagement of a technical advisory committee (TAC) chaired by DOE and USAID. The TAC included stakeholders from across the power sector including all of the DOE's attached line agencies, RE developers, DUs, system operators, generators, regulators, and academia. The purpose of the TAC was to provide guidance on scenarios, methods, and assumptions, and to interpret the results of the study. The project supported the conduct of three TAC meetings from January 2016 to February 2017.

In addition, the project provided DOE with a production cost modeling software, PLEXOS, which was used by the modeling working group to elaborate on the GtG study. Various trainings and workshops were carried out to build the capacity of the modeling working group in the conduct of the study. When the GtG study is completed, it is expected to enhance the capacity of GPH system planners and operators in addressing constraints in the integration of VRE into the Philippine power grid, thus increasing the growth of the RE share in the energy mix. Ultimately, this effort is expected to help reduce harmful emissions from burning coal and fossil fuels.

Philippine Competitive Renewable Energy Zones Process. Indigenous RE resources contribute to GPH's vision to ensure sustainable, secure, sufficient, accessible, and affordable energy. DOE and USAID partnered to lead a group of Philippine power sector decisionmakers in conducting a renewable energy zone (REZ)-based transmission planning process. REZs are geographic areas that support cost-effective RE development, having high-quality RE resources and suitable topography, and having attracted the interest of project developers. The CREZ process will enable future transmission enhancements that encourage development of the Philippines' most productive—and therefore cost-effective—indigenous RE resources. B-LEADERS provided in-country logistical support to the series of activities for the CREZ process, which was spearheaded by USAID, DOE, and NREL.

From May 31 to June 1, 2018, the first meetings of the TAC and Zone Identification and Technical Analysis Working Group, respectively, within the CREZ project, were held. With in-country support from B-LEADERS, a team from USAID's Office of Global Climate Change and NREL facilitated the initial technical work in 2-day meetings attended by about 70 people. The session provided an in-depth discussion on key REZ transmission planning concepts and how they apply in the Philippine context. The aim was to develop a common understanding and vision in implementing the

Philippine CREZ that would promote and enable transmission enhancements and eventually encourage development of the Philippines' indigenous RE resources. A DC was crafted to facilitate the CREZ modeling process and to define the roles of the members of the Zone Working Group and the TAC. A public consultation on the proposed DC, Establishment and Development of CREZ in the Philippines, was conducted on July 31, 2018. Mr. Arnulfo Zabala of DOE's Renewable Energy Management Bureau and NREL experts Mr. Nathan Lee and Mr. David Hulburt discussed the Philippine CREZ process and the relevant provisions under the draft DC. The consultation drew at least 60 participants representing the various attached agencies of DOE, RE developers, consumers, government agencies, and academia. The consultation was carried out to gather comments and suggestions for finalizing the draft DC 2018-09-0027, which was signed in September 2018.

I. MOBILIZING NATIONAL PARTNERSHIPS FOR CLIMATE ACTIONS

Over the course of its implementation, B-LEADERS served as the anchor program of the U.S. Government's EC-LEDS in the Philippines. As such, the project's activities were also anchored on the climate change mitigation priorities of GPH. These activities were designed to contribute to increased climate change resilience and mitigation. The project's goal required a multisectoral strategy; thus, B-LEADERS promoted a consultative and participatory approach that fostered partnerships among national and local government agencies, the business sector, higher education institutions, and civil society organizations.

A strategic B-LEADERS goal, to strengthen national partnerships for climate action, was furthered by the project's sustained assistance in building the capacity of PLLENRO. PLLENRO is a nonprofit environmental organization composed of local ENROs, community advocates, and LGU officers. PLLENRO became the constant partner of B-LEADERS in providing direction on climate change mitigation and promoting awareness on environmental protection, conservation, climate change, and sustainability. Over the years, PLLENRO has provided essential resources, relevant programs, and effective learning opportunities for local ENROs and advocates to develop a community of practice among peers. PLLENRO has provided various capacity-building activities such as peer-to-peer networking on environmental issues, an annual convention, regional events, a study tour, and others.

B-LEADERS has consistently supported PLLENRO's annual conventions since 2014. The network is now composed of more than 700 environmental practitioners and advocates all over the country. Photo credit by B-LEADERS.

LGUs, as the league's key actors, are at the front line of promotion and implementation of environmental and climate change advocacies in accordance with *RA 7160, Philippine Local Government Code of 1991*, and section 14 of *RA 9729*, *Climate Change Act of 2009*. The project sustained its support to PLLENRO to enhance the capacity of LGUs to plan, design, and implement LEDS by providing TA in institutionalizing the GHG inventories, which are essential in developing credible local GHG management plans. Along with this, the project supported PLLENRO's annual conventions, which serve as platforms for information exchange on local and national environment policies and for strengthening partnerships with local and international agencies in promoting and developing environment programs at the local level.

B-LEADERS strengthened its partnership and continued to support CCC, the lead policy-making body of the government mandated to coordinate, monitor, and evaluate programs and action plans related to climate change and pursuant to *RA 9729*. With support from the project, CCC produced a *User's Manual on Community-level and Entity-level GHG Inventory for LGUs*. The manual is a step-by-step guide accompanied by GHG Inventory Quantification Support Spreadsheets. This tool facilitates and institutionalizes the process of planning, collecting and managing data, and quantifying and reporting LGU operations and community-wide GHG emissions.

The project also consistently supported CCC in the annual celebration of National Climate Change Consciousness Week. During B-LEADERS's active time in the Philippines, CCC launched its Greeneration Summit in Luzon. The summit accommodated 700 students from various academic institutions across the region. The summit featured a "Green Arcade" showcasing educational tools and interactive games to raise environmental awareness among youth. The event also resulted in the production and presentation of a 10-minute video called "15 Ways to LEDS." The video was conceptualized and produced by the project in partnership with NYC. To sustain CCC's efforts in educating youth on LEDS activities, the Greeneration Summit was also held in Visayas and Mindanao.

Students participate in Greeneration Summit activities organized by CCC. Photo credit by B-LEADERS.

National Climate Change Consciousness Week also included an LGU Summit. Planning and Environment Officers of the various LGUs shared experiences, challenges, opportunities, best practices, and ideas on climate change mitigation actions. B-LEADERS supported this advocacy through production of an infographic book, *Good Practices on GHG Inventory: Philippine Local Government First Step on LEDS,* and creation and implementation of the Green Arcade.

At the Greeneration Summit in Davao, youth voted for the top 15 Ways to LEDS. Photo credit by B-LEADERS.

B-LEADERS was among the prime movers of the #NowPH campaign, an advocacy organized by CCC and supported by NYC, YPF, and UNICEF. The #NowPH campaign aimed to gather at least 1 million signatures and to empower young people in the call toward a positive outcome for COP21. The campaign collected more than 3.5 million pledges of support via www.nowph.org. #NowPH collected online and offline pledges of support mostly from the youth sector. The #NowPH signatures were presented to French President François Hollande in December 2015 when France hosted COP21. The signatures were intended to encourage the international community to pass an agreement that would limit the increase in global temperature to below 2 °C (3.6 °F). The Philippines and France earlier signed the Manila Call to Action on Climate Change after Philippine President Benigno Aquino III welcomed French President Hollande during his first state visit to the Philippines in February 2015.

Commissioner Jose Sixto Dantes III presents on the #NowPH campaign's 3 million youth who signed for climate action. Photo credit by B-LEADERS.

In 2015, the CCC highlighted the proclamation of November 25 as National Day for Youth in Climate Action and #NowPH Day. The project, in partnership with other partner institutions and youth organizations, supported CCC in the training of trainers (ToT) for youth. The ToT helped develop a cadre of youth advocates from key cities in the Philippines who promoted climate change awareness in schools, youth organizations, and youth networks.

Other youth organizations continued to adopt this advocacy. On March 30, 2017, B-LEADERS supported a youth organization in Sarangani Province in facilitating an educational workshop and designing interactive games that increase understanding and knowledge of LEDS activities under the #NowPH campaign. The discussions and workshops helped equip the youth trainers in further promoting "15 Ways to LEDS" to other youth groups coming from different schools, organizations, and cities.

The #NowPH campaign was expanded to the ASEAN community. In 2017, an event was hosted by the Philippines to give youth the opportunity to work hand-in-hand in developing two documents: the *Zero Draft of the ASEAN Youth in Climate Action and Disaster Resilience Network Framework Agreement* and the *Zero Draft of the ASEAN Youth in Climate Action and Disaster Resilience Day Proclamation* to GPH. Youth leaders participated in brainstorming action plans for the Philippines and to present project proposals to the international delegates. The event was supported by B-LEADERS in cooperation with CCC, NYC, YPF, and UNICEF.


#NowASEAN Filipino delegates brainstorm for the workshop session: Development of Action Plans for the Philippines. Photo credit by B-LEADERS.

B-LEADERS's continued support for the campaign in the ASEAN community led to reinforcing the significance of November 25 for creating awareness among youth about climate-smart lifestyles and adaptation activities. During its 33rd Summit, ASEAN also declared November 25 as ASEAN Youth in Climate Action and Disaster Resilience Day. The Philippines commemorated the first ASEAN Youth in Climate Action and Disaster Resilience Day on the occasion of the National Conference of Youth (COY) on November 23–25, 2018. National COY provided a space for youth and youth organizations to learn about climate change issues and share best climate action practices. COY selected Top Ten Youth-led Climate Actions and conducted a simulation of the annual UNFCCC COP.

Prior to this event, a series of local COYs was conducted covering the three major islands of the Philippines (Luzon, Visayas, and Mindanao), aimed at mobilizing young climate champions at the local level.

USAID and the Miss Earth Foundation have also been partners in strengthening advocacies on environmental protection for years. Miss Earth is an annual national and international beauty pageant that promotes environmental awareness as the core of its advocacy, and its winners serve as environmental ambassadors worldwide. B-LEADERS has been supporting environmental workshops for Miss Earth national and international delegates.

The concerted efforts of B-LEADERS and its key government, nongovernment, and private partners proved vital in enabling local ENROs, NGAs, and other stakeholders to enforce and implement their tasks and responsibilities in promoting LEDS and addressing environmental issues in the country.

J. ELEVATING LOCAL MITIGATION ACTIONS TO THE GLOBAL PERSPECTIVE

In its 5 years of implementation, B-LEADERS has frequently shared success stories, best practices, and challenges of climate change action. For example, the project elevated local and national climate change initiatives to international fora and conferences. Highlighting lessons on local mitigation actions with a global outlook helped create a platform for knowledge management and international cooperation.

At the annual Asia Clean Energy Forum (ACEF) conference, B-LEADERS helped its partners present their initiatives in CE development. In 2014, B-LEADERS supported Mayor Angela Sabando of Roxas, Palawan, in presenting to an international community of CE advocates the experiences with the Green Island RE Microgrid. The project, although small in scale, demonstrated how appropriate technologies and interventions in a small island setting resulted in electricity savings of about 50 percent and carbon emission reduction of 92.71 $mtCO_2e$. In the 2015 ACEF conference, the project highlighted its partnership with DOE in presenting the reviewing procedures, time, and costs related to increasing private investments in CE through EVOSS. The project also supported the participation of its partner LGUs, Iloilo City, Boracay Island, and Mandaue City in the 2016 ACEF conference. The presentations focused on EE and innovations, and featured LGU good practices for LEDS. At the 2017 ACEF, B-LEADERS supported MinDA in sharing the Mindanao Water-Energy Nexus Study in a deep-dive session. MinDA's Assistant Secretary Romeo Montenegro discussed the use of the nexus study in analyzing the impacts of climate projections in Mindanao's hydroelectric power generation, specifically the availability of water for hydropower.

Another milestone was the collaboration of B-LEADERS and DOE in 2015 on drafting, approval, and adoption of the Cebu Ministerial Declaration on Energy by 21 APEC energy leaders. The Cebu Ministerial Declaration contains proposals, for example, on climate-proofing of energy infrastructure, adopting advanced EE technologies, promoting CE in poverty-stricken areas, and improving energy trade and investment. B-LEADERS supported various workshops and writeshops that formulated the Philippine position for the declaration.

Following the 2015 APEC Cebu Declaration, the draft *Guidelines to Improve Climate Change Resiliency of Energy Facilities in Off-Grid Areas* was developed by DOE in cooperation with B-LEADERS. This document offers practical recommendations for stakeholders in the Asia-Pacific region on how to increase climate resilience of energy systems in off-grid areas. The Workshop on Improving Energy Resiliency in Off-Grid Areas in APEC Member Economies was organized in June 2016 and served as a platform for sharing experiences on policy, regulation, institutional arrangements, and technology among the APEC member economies.

B-LEADERS continued its support to DOE in hosting another international initiative, the Asia Cooperation Dialogue (ACD), which was held in August 2017 in Panglao, Bohol. The ACD hosted representatives from 18 member states and three development partners, including energy ministers, chief executives, and other participants from various countries. The sessions focused on the challenges of balancing fuel mix and policy incentives, and explored prospective areas for forming partnerships. Member countries of the ACD Energy Working Group concluded the conference with a planning session in which they formulated key agreements on increased coordination and information sharing. Meanwhile, DOE, with support from B-LEADERS, also focused on improving energy security in Southeast Asian countries as it hosted the 35th ASEAN Ministers of Energy Meeting in September 2017 in Manila. The 3-day exhibition at the meeting included technical presentations, dissemination of market information, sharing of business opportunities, and discussion of power trends.

B-LEADERS continued to participate in addressing urban challenges and sustainable development by sharing knowledge and best practices and promoting cooperative relationships among cities. In

August 2015, The National Sustainable Development Solutions Network was formally launched in Manila, where it highlighted the significance of the network in promoting sustainable development in the Philippines. In September 2015, B-LEADERS supported Iloilo City in hosting the Urban Environmental Accords (UEA), attended by representatives of 37 cities and 23 organizations from 13 countries. The project took the lead in a session on Low Carbon Emission Development in various cities. The event concluded with the signing of the UEA Declaration, which presented the key issues raised at the event regarding energy, water and sanitation, sustainable transportation, and women and youth. The declaration affirmed the need to build and develop the urban nexus[6] as a foundation for sustainable urban development. B-LEADERS also spearheaded a panel discussion on LEDS best practices during the 2016 International Conference on Urban Development in Manila. The discussions shed light on the need for cities to build consensus and cooperation to implement LEDS.

The UEA Forum was held in parallel with the UEA Youth Summit, which was attended by 235 youth leaders. B-LEADERS, in partnership with Iloilo City and Lions Club International, developed a program of interactive and learning games and activities. The participating youth created a declaration in which they affirmed their active role in using all forms of media to advocate for environmental sustainability and help influence policy decisions that address climate change.

Toward the goal of strengthening LEDS activities in the country, B-LEADERS supported its partners in mainstreaming low carbon initiatives in the Asia LEDS Forum. In November 2014, the project supported the participation of the Philippine delegation in Yogyakarta, Indonesia, led by CCC, together with MinDA, DOE, DENR, and the LGUs of Roxas, Palawan. With the theme, "Development through LEDS and Green Growth," CCC members discussed addressing barriers across sectors in implementing LEDS. Roxas LGU Mayor Sabando also shared the RE Microgrid System in Green Island, Roxas, Palawan, which was also highlighted in the Open Space Session where LEDS and green growth initiatives were exhibited.

For the 2016 Asia LEDS Forum, the Philippine delegation, which was composed of the CCC, DOE, ERC, MinDA, and MBBC, tapped the project to conceptualize and design the details of the session, Developing and Using Policy Instruments to Mitigate Risk and Mobilize Investments. The Open Space Session also displayed an interactive exhibit on EVOSS. The 2016 Forum focused on support for countries in securing financing to implement priority actions in the countries' respective INDCs.

[6] The urban nexus is an approach that guides stakeholders to identify and pursue possible synergies between sectors, jurisdictions, and technical domains so as to increase institutional performance, optimize resource management, and services quality.

The opening panel of the Asia LEDS Forum 2016 stresses the need to establish infrastructure and engage with the private sector and other nongovernment sectors for mobilizing finance as policy frameworks on climate change are generally in place in Asian countries. Photo credit by B-LEADERS.

As the lead agency in drafting the Philippine INDC, CCC joined with the Department of Foreign Affairs hosted the third Climate Vulnerable Forum (CVF) Senior Officials meeting in November 2015 in Manila. The forum gathered 20 member countries, with 23 incoming members from different regions, to strengthen synergies and reach agreements on climate change policies to prepare for the negotiations at COP21. The CVF meeting concluded with The Manila Communique as the members' call for supporting a climate-secure framework to keep warming below 1.5 °C.

B-LEADERS's partnership with CCC and the NYC #NowPH campaign secured the participation of Filipino youth in climate change issues. These efforts paved the way for their voices to be heard at the global level during COP21 in 2015. As other climate change action advocates in the international community took note, the #NowPH campaign influenced ASEAN youth to develop a framework under which youth leaders could advance climate action and disaster resilience for ASEAN member states. The #NowASEAN Conference, launched in November 2017 in Manila, inspired and united participants who proposed an ASEAN-wide proclamation to underscore the important role of the youth in nation building, climate action, and disaster resiliency. ASEAN's declaration of November 25 as ASEAN Youth in Climate Action and Disaster Resilience Day was a product of these initiatives.

During COP21 in December 2015, Philippine President Benigno Aquino III and NYC Commissioner-at-Large Jose Sixto Dantes III present the French government with the results of more than 3 million Filipino youth pledges calling for climate action. Photo credit by B-LEADERS.

B-LEADERS continued to assist its partners to participate in these events and activities to share local actions at the global level. Furthermore, these crosscutting activities were necessary to mainstream the project's goals and outcomes, and to highlight and complement the results of the project's major tasks.

K. MOBILIZING PRIVATE SECTOR INVESTMENTS INTO CLEAN ENERGY

Task 2 of B-LEADERS aimed at increasing investments in CE projects. In its 4 years of implementation during the base period, B-LEADERS provided a working mechanism that promoted meaningful interaction among RE developers, financial institutions, and the communities to secure capital and implement projects. Through its mentoring program, the project strengthened the capacities of developers and investors to package and finance viable CE projects. These efforts were complemented with initiatives to minimize barriers to CE projects, for example, by helping streamline business processes to reduce transaction costs and delays.

The project's Mentoring Portfolio was sustained through the years. Depending on the needs of the partner RE developer, support and mentoring services for RE and EE projects were provided. Support activities included providing technical input for prefeasibility and feasibility studies, assisting in navigating through permits and agreements with various government agencies, monitoring of construction, and facility commissioning. B-LEADERS closely monitored the progress of energy projects until they achieved financial closure and were commissioned to operate.

Two projects were reported in FY 2015, namely Green Innovations for Tomorrow Corporation's (GIFT) 12-MW biomass power plant and Isabela Biomass Energy Corporation's 20-MW biomass power plant. For FY 2016, B-LEADERS enabled six additional projects to come online: Bulacan Solar Energy Corporation's (BSEC, formerly CleanTech Global Renewables, Inc.) 15-MW Bulacan Solar PV Plant; nv vogt Philippines' solar PV power projects in Centrala, Dalayap, and Armenia with a combined capacity of 22.55 MW; Bicol Biomass Energy Corporation's (BBEC) 5-MW Rice Husk-Fired Power Plant; and rehabilitation and 19-MW uprating of Power Sector Assets and Liabilities Management Corporation's Agus VI Hydroelectric Power Plant (HEPP).

B-LEADERS successfully brought in equity investors to complete construction of a solar PV plant in time for the company to achieve the benefit of the feed-in tariffs for BSEC. Photo credit by B-LEADERS.

New CE generation capacity in FY 2017 included the 28.59-MW Digos Solar Power Project of Enfinity Philippines Renewable Resources Fourth, Inc., and three biomass power projects: Hawaiian-Philippine Company's (HPCo) 20.58-MW Bagasse Cogeneration Power Plant Project Phase II; San Jose City I Power Corporation's 12-MW Rice Husk-Fired Biomass Power Plant Project Phase II; and Lamsan Power Corporation's 15-MW Rice Husk-Fired Biomass Power Plant Project. Furthermore, half of Hedcor Bukidnon, Inc.'s 43.4-MW Manolo Fortich HEPP Unit 1 is already contracted through a PSA.

HPCo is the oldest operational sugar central in Silay City, Negros Occidental. B-LEADERS mentored HPCo in identifying possible ways to solve its foreign–local ownership structure (40:60) and followed up on its registration for new investment. Photo credit by B-LEADERS.

By the end of the project life of B-LEADERS, the completion of the 68.8-MW Manolo Fortich HEPP was expected wherein Manolo Fortich Unit 2 contributed 25.4 MW. A further 2.4-MW capacity was added in 2018 from Euro Hydro's New Bataan HEPP. In total, B-LEADERS has contributed to an additional 242.0645 MW of CE capacity, which exceeded the Task Order's base year target of 200 MW. Biotech's biogas and biomass projects, which target an additional combined 8.85 MW, are still in the pipeline.

The project supported investments in CE consistent with the Philippine Development Plan (PDP) Chapter 19: Accelerating Infrastructure Development, specifically to Subsector Outcome 2: Strategic infrastructure implemented. Under the heading "Energy," the PDP adopted strategies to:

(a) Accelerate and streamline the business processes for energy projects;

(b) Revisit roles, particularly of government, in the power industry;

(c) Expedite the implementation of remaining policy mechanisms under the *RE Act of 2008* to further encourage development;

(d) Declare energy projects as projects of national significance to expedite the timely completion of energy projects; and

(e) Strictly monitor compliance with DOE DC 2015-07-014 Guidelines for Maintaining the Share of RE in the Country and DC 2015-03-0001 Promulgating the Framework

for the Implementation of Must Dispatch and Priority Dispatch of RE Resources in the WESM.

A map of B-LEADERS's mentored CE projects, including the solar streetlights and rooftops installed in Marawi City, are in Annex D.

L. BUILDING ENERGY RESILIENCE AND ACCESS IN ISLAND COMMUNITIES

Providing an affordable, reliable clean electricity supply is a major challenge for the regions of the Philippines that have dispersed populations living on small individual islands. The problem is compounded because of the country's heavy dependence on imported fossil fuels for power generation. Most of the small island grids use diesel generators and, therefore, suffer from frequent blackouts and unplanned power outages—or worse, no access to electricity. RE-based micro-grids offer promising solutions for resilient and viable energy business models in small island settings. Since 2015, USAID has worked with Sunpower Philippines, Meralco, and the local government of Batangas City to implement a solar PV micro-grid power project for the electrification of Isla Verde. The project is expected to provide electricity to more than 300 households and to supply power for economic activities such as ice production, food processing, operation of resorts and other tourism facilities, and provision of vital water services.

Isla Verde is a 1,700-ha island composed of six barangays and is home to approximately 6,000 people who are not connected to the main distribution network of Meralco. The island is located at the center of the globally critical Marine Coral Triangle and is considered vulnerable to storms and other extreme weather events. The solar PV micro-grid project was designed and is being implemented to complement efforts in protecting natural resources and enhancing local energy self-sufficiency and resilience in this small island community.

Batangas City Government has enshrined as its mission "to improve the quality of life of its citizens through sustained efforts to attain a balanced agro-industrial development; to promote a business-friendly environment; to generate more employment opportunities and to adequately provide the basic infrastructure utilities, facilities, and social services necessary for a robust and livable community." Considering that barangays in Isla Verde are the least developed infrastructure facilities in the city, the LGU is prioritizing the urgent implementation of a reliable power infrastructure on the island.

Through B-LEADERS, a feasibility study for the micro-grid project was carried out in 2015 and partnership-building activities were pursued in 2016. Batangas City Government has identified the provision of electric power service to the island as priority and on March 2, 2017, the Isla Verde Micro-Grid Energy Resilience Project was officially launched. Batangas City, Sunpower Philippines, Meralco, and the residents of the island established partnerships with the help of B-LEADERS. Following the launch, the 615 solar PV modules donated by Sunpower and USAID were delivered to the city's warehouse in June 2017. Procurement of the balance-of-system and batteries was then finalized on August 8, 2017. From August to September, B-LEADERS, Batangas City, and Meralco held coordination meetings, field visits, and technical design integration.

The solar PV micro-grid project in Isla Verde not only provided resilient and reliable power to a village of the island but also tested and defined requirements on logistics, business arrangements, regulatory approvals, and multisectoral implementation. Photo credit by B-LEADERS.

The first quarter of FY 2018 saw the construction of the long-anticipated solar PV micro-grid in Barangay San Agapito in Isla Verde, Batangas City. Activities during the period focused on shipment, fabrication, construction, site preparation, and installation of key components for the first phase of the solar PV micro-grid. The first phase involves the installation and operationalization of a 31-kW solar PV plant, which is part of the total 196-kW solar module network that Sunpower donated in partnership with B-LEADERS and Batangas City LGU. Components relating to phase 1 include the solar modules, mounting frames, power house, batteries, wires, and attendant accessories. Coordination with Batangas City LGU, Meralco, and Barangay LGU and constituents was maintained during construction of the solar PV power plant.

The first phase of a long-term island-wide energy resiliency initiative was completed toward the end of the base period of B-LEADERS. A barangay (village) now has a supply of electricity sufficient to meet its current requirements. Photo credit by B-LEADERS.

In keeping with the principle of inclusive growth under the CDI partnership with Batangas City, B-LEADERS is supporting the LGU in its Isla Verde project through TA, mobilizing public-private partnerships, and where appropriate, investments in some of the capital requirements. Testing and handover of the first-phase 31-kW solar PV power plant occurred in the last year of the base period.

M. INITIATING ACTIONS THROUGH THE POWER OF COMMUNICATION AND MEDIA

B-LEADERS has successfully produced visually compelling, informative, and interactive communications and outreach materials targeted to reach a wide range of audiences, including national and local governments, private sector, and media, youth, and the general public. To convey specific information to its intended participants, B-LEADERS used both traditional media formats and cutting-edge technologies to effectively demonstrate, inform, train, and communicate to various stakeholders.

Since 2014, the project has participated in different local and international fora, conferences, and events to exhibit its activities and initiatives. Some of these exhibits include the Green Strategies, Technologies, and Opportunities to Reduce Emissions or "Green S.T.O.R.E.", which highlighted various best practices in RE, marine conservation, and ecosystem preservation in Green Island in Roxas, Palawan. B-LEADERS produced another diorama depicting the RE micro-grid system in Green Island that was exhibited in various events and conferences such as the Asia LEDS Forum in November 2014 in Yogyakarta, Indonesia. In August 2017, B-LEADERS produced another RE micro-grid system diorama for Isla Verde, Batangas City, which was first highlighted in the Asia Cooperation Dialogue in Bohol. Another innovative diorama featured a replica of the TreeVolution: Greening MindaNOW, an activity spearheaded by MinDA and DENR, which was officially entered into the *Guinness World Records* for planting 2,294,629 trees for the Philippines. The diorama was unveiled during the launching of LEDS Mindanao in May 2015.

As B-LEADERS continued to foster awareness about various LEDS activities, a large format panel was developed to deliver general information. The panel aimed to draw the interest of audiences regarding the simpler initiative of low carbon development. The LEDS panel was launched in October 2014 in Greeneration Davao and was exhibited in numerous events, particularly youth activities.

B-LEADERS extended its assistance by highlighting the LEDS activities of some of its partner LGUs. For example, in March 2016, B-LEADERS supported Batangas City in highlighting its green initiatives and best practices during the Green Business Summit, and the project produced infographic panel boards emphasizing Iloilo City's LEDS activities, which were exhibited during the Pathways to LEDS Forum in August 2016 and Clean Air Month Celebration in November 2017. Meanwhile, different sets of printed materials were also exhibited to promote Iloilo City's campaign against air pollution.

Interactive exhibits also helped communicate climate change issues to the target audiences. In December 2016, DOE and B-LEADERS launched the Energy Strategy Rotating Lantern, which embodies the eight-point agenda of the DOE Secretary, represents the nine strategic initiatives defined by the Energy Family, and presents the recrafted vision formulated by the Executive

Council. The DOE Energy Strategy Lantern is currently installed in the main lounge of the DOE office in Taguig City. It has been featured in different DOE activities, such as ACD and various E-Power Mo! Investment Fora in 2017. Moreover, B-LEADERS developed an interactive exhibit during the ASEAN Ministers of Energy Meeting in September 2017. The exhibit highlighted DOE's strategic directions and activities through a combined presentation of life-sized panel boards, slideshows, and audiovisual presentations (AVPs), which were looped in tablets.

B-LEADERS has also been highly focused on developing communication materials aimed at youth. In past years, the project gave fewer formal lectures and instead developed different interactive games to better engage and educate youth on environmental protection. B-LEADERS introduced the Interactive Games during Greeneration in November 2014 and the Green Arcade during UEA in September 2015. The activities included board games, relays, puzzles, and quizzes to teach youth about LEDS and the environment. Some of the games were used in other youth activities and events.

The project consistently used special media materials to communicate to a wider range of audiences. Since 2014, B-LEADERS has produced various collateral materials such as shirts, umbrellas, flashlights, notebooks, bags, and tumblers. Such items incorporate designs with information on the "15 Ways to LEDS" and infographics on climate change mitigation. The items were distributed as prizes for the interactive games and tokens for selected communications and outreach activities.

B-LEADERS also used cutting-edge technologies to present its ideas, particularly regarding the global perspective. B-LEADERS has produced its presentations through Adobe Flash and Prezi, a web-based presentation software that enables dynamic transitions. These presentation formats were demonstrated in most international conferences such as ACEF, Asia LEDS, and WaterLinks Forum. B-LEADERS also supported DOE in devising creative synthesis presentations for some fora such as ACD, E-Power Mo! Investment Fora, and Smart Grid Forum.

In some cases, use of conventional forms of media in video and print were considered effective to convey specific messages and information to the targeted audiences. AVPs were produced by the

(Left) During the WaterLinks 2018 Forum, NWRB Executive Director Dr. Sevillo D. David, Jr., acknowledges USAID's efforts through B-LEADERS in helping the national government conduct studies on water resources and in addressing the gaps in water resources management. (Right) MinDA Executive Director Janet M. Lopoz highlights the collaboration of key government agencies in the development of hydrologic models to quantify water-scarce and water-rich areas in the Philippines. To illustrate the results of this assessment, B-LEADERS joined the forum with an exhibit of a baseline water security map, an energy demand and agriculture investment map, a water balance map, and an overlay of the impacts of climate change. Photo credit by B-LEADERS.

project mainly to provide activity overviews and promote environmental concepts. In 2014, B-LEADERS supported CCC and NYC in the production of the "15 Ways to LEDS," which has become the flagship promotional item for the #NowPH campaign. It was first premiered during the Cinema Ad Launch in partnership with SM Cinema in 2014. The "15 Ways to LEDS" was translated into different local languages to extend its reach to the country's overall population.

An audiovisual motion graphics presentation was produced to provide an overview of the CBA for Mitigation Options. B-LEADERS presented a short video on the energy resilience in off-grid areas in APEC economies, used as a backgrounder and agenda-setting medium for the Workshop on Improving Energy Resiliency in Off-Grid Areas in APEC Member Economies held on Boracay Island in June 2016. Finally, B-LEADERS supported Iloilo City in the production of a hand-drawn AVP featuring the Hinactacan Mangrove Ecopark Video Proposal in Iloilo City and the total carbon sequestration potential of its mangrove forest.

B-LEADERS developed print manuals to convey extensive information on the environment, LEDS, and climate change mitigation. For example, B-LEADERS produced the *Bahay Kaalaman Facilitators' Module*, a training guide for facilitators on conducting educational tours at the Bahay Kaalaman (House of Knowledge) in Batangas City. Since then, Bahay Kaalaman was featured in *The Philippine Daily Inquirer* and served as a venue to Inquirer Read Along sessions and for the National Environment Month Celebration of CCC and LGU partners. The project also used infographics in its publications, *Good Practices on GHG Inventory* and the *Philippine Climate Change Coffee Table Book*, both launched in the Business Summit in November 2015 and distributed at COP21 in Paris.

B-LEADERS distributed user manuals for *Entity- and Community-Level GHG Inventory for LGUs in the Philippines*. The user manuals provide easy-to-understand, step-by-step instructions to aid LGU stakeholders in developing and implementing activities for the collection and management of GHG data. They can subsequently use these data when quantifying and reporting their annual GHG inventories.

At the USAID Philippines' Environmental Infographics Competition in 2014, two entries from B-LEADERS were chosen in the final round. The winner was determined based on the number of Facebook likes. B-LEADERS's entry, entitled "Two Sides of Climate Action: Mitigation and Adaptation," won the competition with about 5,000 likes. Demonstrating the effectiveness of social media in reaching wider audiences, B-LEADERS supported Makati City in preparing social media infographic campaign materials for the World Wildlife Fund's Earth Hour City Challenge in 2016.

B-LEADERS also encouraged the use of multimedia materials for specific activities such as EVOSS to raise awareness and further the knowledge of its participants on how to navigate the system. In 2015, an overview video was launched to elaborate the goals of EVOSS. As the initiative developed, the video progressed into a series of AVPs that provided updates on its implementation. An instructional video was also produced for potential RE developers that wish to register for the system. B-LEADERS developed a user's manual that contains extensive information on the one-shared system. Because of the success of this initiative, EVOSS was featured in ACEF 2015 through a presentation created in a Prezi platform, and in the Open Space Session of Asia LEDS Forum 2016 in Hanoi, Vietnam, through an interactive 3D and multimedia exhibit.

Among the most successful campaigns supported by the project was the #NowPH campaign, led by CCC and NYC. The campaign used AVPs, infographics, and special collaterals. The campaign's most globally symbolic gesture was the delivery of 3 million Philippine youth signatures to former French President François Hollande at COP21 as part of the Philippines' commitment to the Paris Climate Agreement. The #NowPH campaign received the Gold Anvil Award for Public Relations Programs: On a Sustained Basis Environment/Science and Technology.

The Asia LEDS 2016 Open Space forum featured a 3D interactive EVOSS exhibit. EVOSS aims to 1) accelerate the increased share of RE in the total energy mix through facilitating and streamlining business processes and creating more transparency and accountability among government agencies, and 2) foster a healthy partnership between public and private sectors. Photo credit by B-LEADERS.

These communications and outreach materials were developed to reach a wide range of audiences and to advance knowledge and understanding among the project's target participants and stakeholders. These materials directly contribute to crosscutting and communications and outreach activities to further facilitate, enhance, and leverage the results of the project's Task 1 and Task 2.

N. EMPOWERING STAKEHOLDERS FOR ENERGY SECURITY AND EFFICIENCY

B-LEADERS has been a key partner of DOE in the nationwide communication and outreach campaign, E-Power Mo! This campaign embraces all bureaus and functions under a single platform. On July 12, 2017, B-LEADERS supported DOE, which collaborated with the Presidential Communications Operations Office and the Philippine Information Agency, in launching the campaign. The event started with a major energy consumers and stakeholders conference held at the Philippine International Convention Center in Manila. With the tagline, "E-power Mo! E-safety mo, E-secure mo, E-diskarte mo," the campaign aims to empower stakeholders with information and

options on the proper exploration, safety, development, and utilization of energy resources in line with the country's economic development (see ***Figure 14***). The event drew at least 900 people from various stakeholders in the energy sector including consumers, project developers, electricity suppliers, DUs, ECs, and others. The conference included six breakout sessions: Downstream Oil and Natural Gas Sector; Upstream Sector; Renewable Energy Sector; Power Sector; Alternative Fuels and Energy Efficiency Sector; and Consumer Sector. The breakout sessions were organized to inform participants about current and upcoming programs, projects, and activities of DOE and to share insight from concerned stakeholders. B-LEADERS assisted in the design, logistics coordination, and facilitation of the event as a partner with DOE in the implementation of key energy initiatives.

The conference for energy consumers and stakeholders, E-Power Mo! aims to provide essential information on fast-evolving developments in the energy sector, proper energy utilization, and energy resiliency.

Figure 14. E-Power Mo! conference promotion

During the launch, DOE Secretary Cusi said that the conference represents a paradigm shift in the approach to energy development and energy use and is anchored in PEP 2017–2040 and DOE's comprehensive sectoral roadmap. Secretary Cusi stressed the government's vision to transform the country into an upper-middle-income economy by 2022 through "DUTERTENOMICS"—a "golden age of infrastructure." The campaign has four guiding principles that summarize the President's energy policy agenda:

1. Develop and utilize the energy resources available to Filipinos for wealth creation and global competition (E-POWER MO);
2. Undertake safety and savings measures through energy efficiency (E-SAFETY MO);

3. Secure the delivery of quality, reliable, and affordable energy services (E-SECURE MO); and
4. Empower consumers through a wide range of options in utilizing conventional, renewable, and alternative energy sources (E-DISKARTE MO).

DOE Secretary Alfonso Cusi (eighth person from left) leads the launch of the E-Power Mo! campaign along with Presidential Communications Operations Office Secretary Martin Andanar (seventh person from left) and other key officials. In his speech, he emphasized energy sufficiency as a cornerstone of the Duterte administration's vision for a globally competitive and inclusive economy that improves the quality of life of all Filipinos. Photo credit by B-LEADERS.

B-LEADERS sustained its support to the campaign. On September 7, 2017, and October 3, 2017, the Visayas and Mindanao legs of the E-Power Mo! campaign were held at Marco Polo Hotel Cebu City and Grand Regal Hotel Davao City, respectively. The Visayas and Mindanao events were attended by at least 750 and 400 participants, respectively. The project supported the fourth E-Power Mo! event held on November 29, 2017, in Clark, Pampanga, which was billed as the Smart Energy Utilization Forum, aimed at informing consumers about smart technologies for better and more efficient energy options. At least 600 attendees participated in this event.

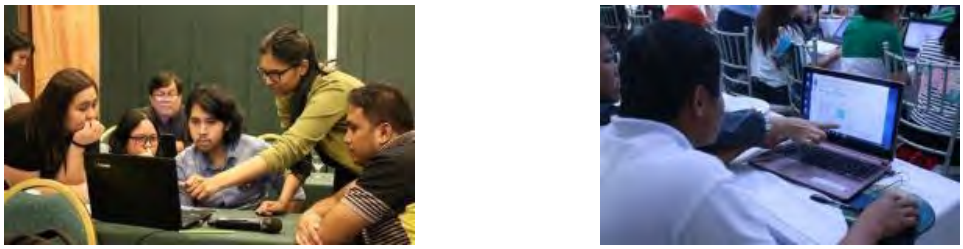
A number of E-Power Mo! events were carried out in 2018. B-LEADERS will continue to promote knowledge of DOE's services among the communities. On April 24, 2018, the fifth E-Power Mo! event was held in Baguio City with the theme, Communicating Efficiency Across the Energy Sector. At least 420 energy sector stakeholders attended the event. The sixth event was held on June 26, 2018, at the DOE Energy Center in Taguig City, with the theme, Toward an Energy Resilient Philippines. This event attracted approximately 650 participants. The forum provided stakeholders with full appreciation of DOE's DC on the adoption of energy resiliency in the planning and programming of the energy sector.

Since its launch, E-Power Mo! has attracted an estimated 3,500 participants from stakeholders including energy developers, investors, consumers, and others across the Philippines.

SECTION 7: INSTITUTIONAL STRENGTHENING

The main objective of B-LEADERS is to strengthen cooperation with GPH and its key partners to plan, design, and implement LEDS. Focus was on enhancing the in-country capacities of CCC, DOE, and other NGAs, LGUs, nongovernmental organizations (NGOs), and the private sector. The primary partners and beneficiaries during project implementation were CCC, DOE, ERC, OSG, DENR, DOTr, MinDA, PLLENRO, CE project developers, DUs, local private sector partners, youth, and partner cities Iloilo, Batangas, Tagbilaran, Zamboanga, Cagayan de Oro, and Mandaue. Throughout its 5-year implementation period, the project has built the capacities of a total of 6,038 person-equivalents—48.4 percent of which are represented by women—in support of enhancing the institutional capacities of a total of 1,312 institutions.

CCC is the Philippines' lead policy-making body tasked to 1) coordinate, monitor, and evaluate government programs and 2) ensure mainstreaming of climate change in national, local, and sectoral development plans to achieve a climate-resilient and climate-smart Philippines. Because B-LEADERS is anchored in the MOU between CCC and USAID on EC-LEDS, the project designed various demand-driven capacity-building measures for key personnel from CCC and its partner lead government agencies. B-LEADERS provided a total of 3,248 person-hours of trainings to CCC alone, training their personnel in the use of software such as LEAP and ALU. These tools enabled CCC staff to project different baseline and mitigation scenarios from several LEDS options in the energy sector and to simplify the accounting of GHG emissions from the ALU sector, respectively. Personnel were also trained on the use of sectoral and integrated CBA Spreadsheet models, which were custom-made for the Philippines to update its quantitative information base for submission of its NDC to UNFCCC.



Participants from CCC and its partner lead government agencies learn to navigate through (Left) the data entry interfaces of the CBA and (Right) ALU tools. Photo credit by B-LEADERS.

CCC regularly organizes capacity-building activities on GHG Inventory for LGUs and the private sector, including its partnership with DILG's Local Government Academy to teach LGUs how to formulate enhanced LCCAPs. On request of CCC, in-house trainers and resource staff were capacitated on entity- and community-level GHG Inventory and Accounting. Participants also took part in hands-on exercises on the use of the customized GHG Quantification Spreadsheet. Along

with the training modules, this spreadsheet was previously developed by B-LEADERS, and its adoption as the common national tool was jointly launched by USAID and CCC in March 2016. Thereafter, CCC's in-house staff, particularly from its Climate Change Office's (CCO) Implementation and Oversight Division and Strategic Partnership Division, served as resource staff for the GHG Inventory trainings conducted for LGUs nationwide. Aside from regional trainings, the CCC-CCO now accommodates requests from provincial governments for focused training and coaching sessions on the topic, which are organized for the provinces' cities and municipalities.

Along with CCC, NGAs like DOE, DOTr, and DENR were capacitated by B-LEADERS on the use of LEAP and CBA sectoral models, including special sector-focused ALU trainings for the forestry and agriculture sectors. In total, DOTr and DENR received trainings equivalent to 1,776 and 2,912 person-hours, respectively. These measures enabled the NGAs to navigate through the tools, update and process sectoral data, and submit sectoral NDC contributions for compilation of CCC and NEDA. The ALU training also helped FMB to design a domestic system for accounting, verification, and certification of forest carbon projects with support from B-LEADERS, aimed at ensuring sustainability of efforts.

DOE has been one of B-LEADERS's most important government partners. The relationship has been based on mutual trust. Over the years, the project has assisted DOE in conducting its strategic planning workshops (SPWs). SPWs are regularly conducted by DOE to track its progress and improve performance, and to address DOE's issues and concerns with appropriate measures and realignments. Key results of B-LEADERS-supported SPWs included prioritization of strategic concerns and identification of follow-up actions that would require collaboration with different bureaus and support services.

B-LEADERS partnered with DOE to promote the use of RE and expand the share of RE use in the Philippine energy mix, in line with the department's mandate to coordinate and supervise plans and programs of the government on energy exploration, development, utilization, distribution, and conservation. Key personnel from various bureaus and offices of DOE were trained to use LEAP, which supported development of an energy plan for the Visayas region. They were also trained on EVOSS, an online platform developed with B-LEADERS to help streamline the application process for power projects. DOE-IPO populates the data in the EVOSS hardware and software tools provided by the project.

To ensure immediate buy-in from RE developers and government agencies, DOE-IPO teamed up with B-LEADERS to coach participants in using EVOSS—from the registration process to the updating of project details. The walk-through trainings were conducted to introduce the features of the system, define the roles of RE developers and government agencies in managing the system, and guide participants in updating project information and uploading project documents. The delegates became the first project developers to register and use the system and, consequently, to assist DOE in ensuring that EVOSS included the requisite information for permitting and licensing.

(Left) B-LEADERS's information technology expert, Mr. Dino Cavestany, explains to DOE-IPO Chief, Ms. Lisa S. Go, the steps in the user's registration and how to update details of the power project. (Right) Both DOE and B-LEADERS guide RE developers through the developer's module of EVOSS. Photo credit by B-LEADERS.

Following passage of EO 30 and its then draft IRR, B-LEADERS supported DOE in organizing an FGD for at least 40 key personnel representing the newly formed EICC (composed of DOE and its attached agencies) and DENR. The activity elicited comments, suggestions, and guidance from the members of EICC to form a comprehensive IRR document that would later become DC 2018-04-0013. A series of nationwide IEC campaigns were then carried out to inform and gather feedback from key stakeholders regarding the salient provisions of the policy. These events were held on April 19, May 8, May 10, and May 18, 2018, in Metro Manila, Cebu City, Davao City, and Puerto Princesa City, respectively. The event trained more than 400 participants and representatives from various energy stakeholders, including consumers and representatives from NGAs, DUs, ECs, transmission operators, generation companies, energy resource developers, academic institutions, and NGOs.

B-LEADERS also assisted NREB and DOE with full implementation of the incentives under the *RE Act of 2008*, specifically through RPS. The RPS policy requires electric power industry participants such as generators, DUs, or suppliers to source or produce a specified fraction of their electricity from eligible RE resources. DUs and ECs had to be trained in projecting their respective RPS requirements and the corresponding generation capacities that would be needed for compliance.

B-LEADERS supported the development of a tool to forecast the energy capacity requirements needed by the mandated participants to comply with RPS. This is supplemented with a User's Manual that provides a step-by-step guide on how to use the RPS simulation model, as shown in Annex E.

The project initially partnered with MinDA, DOE, NEA, and AMRECO in organizing a training workshop. After the signing of the DC promulgating the rules governing RPS in December 2017, B-LEADERS supported coaching sessions on April 3 and 10, 2018, to capacitate and prepare the trainers for the regional IEC rollout on the Rules and Means of Compliance of RPS for the On-grid Market. B-LEADERS then supported DOE and NREB in the rollout activities. The first rollout activity kicked off in Davao City on April 13, followed by workshops held in the cities of Batangas, Cebu, Iloilo, Legazpi, Cagayan de Oro, Zamboanga, Clark, Tacloban, and Ilocos Norte on April 20, April 26, May 3, June 20, July 11, July 25, August 2, August 16, and August 23, 2018, respectively.

The culminating event was carried out on November 27, 2018, which concluded the regional IEC campaign and further provided a venue for public consultation on the draft REM rules.

Participants from DUs and ECs use a forecasting model developed by B-LEADERS to calculate corresponding RPS requirements. Photo credit by B-LEADERS.

EPIRA created ERC as an independent, quasijudicial regulatory body tasked to promote competition, encourage market development, ensure customer choice, and penalize abuse of market power in the electricity industry. On a request from ERC, B-LEADERS provided support for a series of training workshops on power supply contracts, regulatory finance, and energy laws. The trainings enhanced the understanding of both the legal and technical ERC staff. The trainings covered various aspects of the power sector and the commission's roles in providing legal and technical support for the resolution of cases. Specifically, B-LEADERS covered a wide range of topics about *EPIRA*, CSP, and the *RE Act of 2008* and its implementing policies, the RPS for On- and Off-Grid Areas and the REM rules. Similar modules have also been shared with lawyers from OSG who serve as legal defenders of the Republic of the Philippines.

The training built ERC's capability to harmonize the technical and legal aspects of the various orders and decisions being issued to support its mandate to enforce energy rules and regulations. ERC took the opportunity to draft specific implementing rules to address the policy gaps that were identified during the trainings. B-LEADERS provided guidance to ERC in many areas including the review of bilateral PSAs, rules governing the issuance of licenses/authorization to retail electricity suppliers, rules for contestability, and the implementing guidelines for CSP in DU procurement of power supply for their captive market. These policies would later help strengthen ERC as an institution mandated to safeguard electricity rates and services.

(Left) B-LEADERS's Senior Policy Expert Mr. Michael Pitlock emphasizes that DUs should identify the electricity consumption pattern of their respective captive markets and define contracts specific for base load, intermediate, or peaking requirements. (Right) OSG Atty. Tomas Navarro asks about the impact of sourcing electricity from RE power plants on local electricity prices. Photo credit by B-LEADERS.

MinDA has been a major strategic partner of B-LEADERS. The implementation of all B-LEADERS activities in Mindanao has been closely coordinated with MinDA. Created under *RA 9996*, MinDA was given the mandate to promote, coordinate, and facilitate the active and extensive participation of all sectors to advance the socioeconomic development of Mindanao. MinDA also implements the LEDS Mindanao Program and OSFMC, supported by B-LEADERS. OFSMC provided RE mentoring services and facilitates the release and processing of permits required by relevant agencies—which inspired DOE to establish EVOSS. Specifically, MinDA personnel were trained on topics such as RE permitting and licensing processes, energy demand side management, RPS, WESM, WEFN, GHG Inventory, and development of LCCAPs. In addition, MinDA and MPMC are expected to play a pivotal role in the implementation of the *BOL*, so key personnel were capacitated on *BOL*'s energy and water asset management provisions.

On June 22, 2018, USAID Mission Director Mr. Lawrence Hardy II met with the Chairman of MinDA, Secretary Alonto, in Davao City to celebrate strengthening partnerships for a resilient Mindanao. Among the highlights of the visit was a walkthrough of OSFMC, which serves as the central repository of information on energy projects and offers coaching services to interested private investors. OSFMC helps expedite permit processing necessary for the rapid deployment of power projects, provides guidance to new investors on the different opportunity areas, and monitors the status of projects being planned. MinDA provided the technical staff and office for the operation of OSFMC, while B-LEADERS was responsible for designing the digital platform, capacity building of technical staff, and providing hardware. The work done for OSFMC was used to create a similar platform for DOE's EVOSS.

MinDA Secretary Datu Abdul Khayr Alonto presents a token of appreciation to USAID Mission Director Lawrence Hardy II for USAID's continued support to Mindanao in promoting LEDS and energy resiliency. Photo credit by B-LEADERS.

B-LEADERS earlier supported MinDA in conducting the Mindanao Water-Energy-Land Use Nexus Study to determine how the changing climate could impact Mindanao Island's future water and energy supply. The lessons from this initiative attracted the attention of relevant NGAs that sought to upscale it to the national level. Building on NWRB's initiative to develop the Philippines Water Security Roadmap, B-LEADERS was asked to help provide the food and energy security lens, improve the roadmap's analytical framework, and subsequently update the water resource maps for river basins. The goal was to integrate processes by linking maps, tools, and datasets from various agencies concerned with water resource management and use. NWRB led the effort and B-LEADERS supported substantial work in institutional coordination, data sharing, and capacity building on WEFN initiatives. The partnership brought together NGAs and local actors such as PAGASA, NAMRIA, NIA, DA, DENR (FMB, EMB, and its River Basin Coordinating Office), NEDA, MWSS, DILG, LLDA, and LGU of Santa Rosa.

Assisting with the nexus study, B-LEADERS and NWRB jointly developed customized hydrologic models to quantify water-scarce and water-rich areas in the Philippines. A series of related workshops was conducted to capacitate the Philippine water sector on the use and application of the hydrological resource analysis modeling toolkit to ensure sustainability. The hydrological tools come with illustrative maps and user-friendly data input systems, all geared toward developing a common or integrative platform that will link various river basin, agro-economic, and industrial corridor plans, at least initially in Mindanao.

In November 2011, GPH and the U.S. Government joined a new Partnership for Growth (PFG) to address constraints to economic growth and development in the Philippines. Under PFG, USAID works through CDI to strengthen the economic competitiveness and resilience of secondary and

tertiary cities outside of Metro Manila. The program's goal is to help build these cities as engines of growth that are inclusive, environmentally sustainable, and resilient. Throughout the base period of B-LEADERS, the project supported the advancement of local climate change actions with its CDI partners and, in the process, enabled LGUs and stakeholders to learn and sustain their new knowledge and programs. Beneficiary CDI cities include Batangas, Iloilo, Tagbilaran, Cagayan de Oro, and Zamboanga. The training covered a wide variety of local LEDS topics, including GHG Inventory, GHG management planning, LCCAP formulation, Green Business Summits, energy audits and walkthroughs to identify RE and EE options, Green Building Code formulation, charcoal value chain studies, assessments of carbon stock and carbon sequestration potential of mangrove forests, and use of the various local LEDS toolkits developed by B-LEADERS.

Iloilo City personnel were trained on GHG Inventories and energy audits, LEDS toolkits, and how to develop the city's LCCAP. In total, 8,392 person-hours of training were provided. The project supported training and coaching of the LGU's partner universities to update and institutionalize GHG Inventory in Iloilo City. To establish a time series on citywide GHG emissions and subsequently institutionalize GHG Inventory and Accounting, training was provided for the LGUs of Metro-Iloilo Guimaras Economic Development Council and professors, who will be future trainers, from five universities (UP Visayas, USA, CPU, Western Institute of Technology, and JBLFMU).

Batangas City was provided with training workshops on the use of the LEDS toolkit and guided in developing its Enhanced LCCAP to feature LEDS or mitigation components in the currently adaptation-focused LCCAP outline. The city council signed a resolution adopting the LCCAP of Batangas City; this local policy eventually served as a model in developing a robust LCCAP featured during the PLLENRO 2017 Convention. In addition, city personnel were trained in the assessment of the carbon sequestration potential of mangroves. In total, the LGU received 9,792 person-hours of training.

Realizing that climate change challenges the way enterprises conduct business, B-LEADERS supported the Batangas City Government and MBBC in organizing the Batangas Green Business Summit, the first LGU-initiated climate change event in the Philippines. The initiative led to the joint crafting, signing, and adoption of the Batangas City Green Business Summit Declaration, which advocates for sustainable businesses and products, including climate change mitigation technologies and services. A number of LGUs and business associations currently plan to replicate this initiative and strengthen its institutional linkages with its host LGUs.

For Tagbilaran City, B-LEADERS provided an equivalent of 4,552 person-hours of trainings on topics such as GHG Inventory, LCCAP formulation, and energy audit and efficiency workshops.

In Cagayan de Oro and Zamboanga, activities had always been organized and implemented in close consultation with MinDA through its LEDS Mindanao Program, which was jointly launched by USAID and MinDA on May 18, 2015. This also bridged local LEDS-related concerns with the overarching program of MinDA, which duly integrated these aspects in their work. Key personnel from Zamboanga City LGU received 4,248 person-hours of training on conducting a GHG Inventory and assessing mangrove carbon stocks. LGU Cagayan De Oro City received 4,160 person-hours of trainings on entity- and community-level GHG Inventory.

Institutional knowledge of GHG Inventory in CDI sites is preserved with the establishment or designation of the LGUs' respective committees, typically comprising trained staff from the various departments within the LGUs as well as its local government and private sector partners. Examples include the ZCAGB Resolution 001-2016 on the conduct of Zamboanga City's GHG emissions inventory, the Tumaga River Water Quality Management Area Governing Board (TRWQMAGB) Resolution No. 2016-05 authorizing the TWG of TRWQMAGB to lead mangrove carbon sequestration assessment, local EO No. 2016-20 creating the TCCCC, local EO No. 2016-165 creating the Cagayan de Oro GHG Management Committee, and the draft MOU between Iloilo City Government and its partner universities.

PLLENRO's future GHG Inventory and Accounting trainers exchange ideas on how to effectively mentor fellow LGU ENROs. Photo credit by B-LEADERS.

Although Mandaue City is not listed as a CDI site, B-LEADERS helped its LGU to formulate a policy for encouraging owners to implement EE in existing and new buildings. The city was given a series of trainings and writeshops for developing its own Green Building Code and rules and regulations. Because of its ordinance, the city was recognized as a Low Carbon Town Model by the APEC Forum. The training modules and the policies that were supported by B-LEADERS were taken up by Iloilo City, which is also considering offering incentives for green buildings. In addition, B-LEADERS provided 4,016 person-hours of LCCAP training to Mandaue.

"... B-LEADERS is very critical in the achievement of PLLENRO's targets when it comes to: One, the capacity building of its members especially on GHG inventory and accounting as well as crafting our GHG Management Plans. Secondly, B-LEADERS is helpful when it comes to the provision to the service level ... because our clients are the LGUs in the Philippines ... through constant mentoring and provision of resources for the organization. As PLLENRO, we can now reach out to other LGUs ... especially [the] third and fourth class municipalities. Lastly, the project is also very helpful in being very consistent and sustainable in terms of responding to the thrusts and direction or mandate of the organization; through the help of B-LEADERS, we've been very consistent and focused in what we want to achieve as an organization."

Ms. Raquel Naciongayo
PLLENRO Treasurer and Head of Pasig City ENRO

"PLLENRO's significant contribution to the partnership: First, the commitment of the league in delivering all the partnership agreement that we have and, of course, is the network of LGU leaders to conduct these programs and projects."

The impact of B-LEADERS's work in capacitating LGUs was further enhanced due to its longstanding partnership with PLLENRO. Over the years, PLLENRO and B-LEADERS provided various learning opportunities for local ENRO advocates to develop a community of practice among peers through several capacity-building programs such as peer-to-peer networking, annual convention, and regional trainings, among others. PLLENRO also serves as a platform for information exchange on local and nationally responsive environmental policies, and as a venue for strengthening partnerships with local and international agencies in promoting and developing environmental and green growth programs. B-LEADERS helped the organization during its planning workshops and in the conceptualization of its annual national conventions. During one of its meetings, PLLENRO planned to mentor LGUs on GHG Inventory, energy audit, LCCAP preparation, and formulation of GHG management ordinances. USAID supported the group's plan and organized a ToT event on entity- and community-level GHG Inventory and Accounting. Future trainers were capacitated based on the guidance manual developed by B-LEADERS and duly adopted by CCC. The ToT session covered climate change issues, relevance of GHG Inventory to the LGUs' low carbon development pathway, and the role of the PLLENRO trainers' pool in mentoring their fellow LGU environment officers. B-LEADERS also supported PLLENRO in building the capacity of some of its regional chapters. In total, the project provided trainings to 26 core officers, representing 208 person-hours.

The PLLENRO team met with CCC Secretary Emmanuel M. De Guzman. The purpose of the meeting was to establish PLLENRO as a partner of CCC in developing the capacity of LGUs in GHG Inventory and LCCAPs. This partnership illustrates the success of the capacity-building activities supported by USAID with the officers and members of PLLENRO. It also serves as a model of "communities of practice" that can be replicated in other sectors throughout the country. B-LEADERS-trained PLLENRO members have since been invited as regular resource persons.

CCC Secretary Emmanuel M. De Guzman and Assistant Secretary Romell Antonio O. Cuenca explore stronger partnerships with PLLENRO in promoting local climate change planning and implementation. Photo credit by B-LEADERS.

The partnership of DOE, MinDA, and LASURECO was instrumental in the project since its inception. In Marawi City, the strong involvement of these partners helped the city rebuild its infrastructure after the ISIS conflict. The partnership served to ensure that project initiatives were in line with the government's coordinated efforts to secure energy facilities, restore and enhance LASURECO to financial and operational standards to meet governance and institutional parameters, and empower local actors and stakeholders to contribute to rebuilding efforts through capacity building.

B-LEADERS's support to LASURECO in recovering its consumer database and assessing the extent of damage to its power infrastructure have been important first steps needed for the EC to restore power supply and safeguard its financial stability. The baseline results were used to determine focal areas where GPH resources could be made available to help LASURECO.

All activities have been interactive in nature, and the partners, especially LASURECO personnel, have been involved in the planning workshops, training sessions, and analysis of resiliency options. The EC's focal team revisited its operations before and after the Marawi siege as part of a series of workshops to develop LASURECO's RCP and ERP. The team consequently identified measures to enhance LASURECO's distribution network. With guidance from B-LEADERS, LASURECO personnel participated in the prioritization of RCP projects and their prefeasibilities, financial modeling, and business plan development, which were used to finalize LASURECO's draft ERP and comprehensive RCP.

An important consideration to ensure uninterrupted operations and sustainability of solar PV installations is access to O&M services. Options were identified to mobilize government and private funds to restore electricity services and provide economic opportunities for the Maranao people. One option was to train solar technology technicians, aimed at strengthening the technical capability and local presence of suppliers and installers to support LASURECO and establishing a baseline for similar initiatives in the future. B-LEADERS complemented the installation activities with training

on O&M and warranty calls for the solar PV streetlights, which were attended by technical and administrative staff from LASURECO and Marawi-based solar installation crew members. Social and economic activities in the area were supported with skills development of OSY from Marawi and its neighboring towns; those trained later earned TESDA certificates, which are recognized all over the country and in most regions abroad.

Further institution-building efforts were carried out when B-LEADERS facilitated onsite capacity-building activities and peer learning sessions for key technical personnel from LASURECO on November 6, 2018, with its counterparts in Nueva Ecija. San Jose City Electric Cooperative shared its profile, portfolio, and operations, and carried out interactive discussions on lessons that could be benchmarked by LASURECO. The participants then visited rice husk-fired biomass power plants that were previously mentored by B-LEADERS and are now operational: San Jose City I Power Corporation's Phases 1 and 2 in San Jose City, which each produce 12 MW of electricity, and GIFT's 12-MW power plant in the Municipality of Talavera.

LASURECO personnel participated in field learning. They visited the Science City of Muñoz to observe the operation of a napier grass nursery managed by an NGO, Ecological Resources Management and Technical Services, Inc. Napier grass is an alternative energy crop that can be used as feedstock in biomass power plants. LASURECO personnel also visited a 10.8-MW napier grass-fired biomass power plant that is currently being constructed by Grass Gold Renewable Energy Corporation in the Municipality of Llanera. A drone was deployed for demonstration at the construction site; participants received hands-on tutorials on using a global positioning satellite device for geotagging applications and software for overlaying geotechnical maps. LASURECO field learning participants were the planning and design supervisor, substation engineer, systems analyst, and information technology technician.

A photo gallery of B-LEADERS's work with partners and stakeholders is featured in Annex F. Copies of the submitted annual progress reports for FY 2014, FY 2015, FY 2016, FY 2017, and FY 2018 may also be accessed in Annex G, Annex H, Annex I, Annex J, and Annex K, respectively.

SECTION 8: CHALLENGES

The concluding years of B-LEADERS were marked by challenges that tested the team's resilience, resourcefulness, and innovative partnerships. At the same time, these challenges opened up new opportunities that expanded the team's technical expertise and sectoral network.

A. POLITICAL CHANGES

In 2016, the country saw sweeping and unexpected political changes resulting in sudden shifts in policy directions, specifically in the CE sector. The newly elected Philippine President openly supported coal-fired power plants, which the new government deems critical to the achievement of inclusive and strong economic growth. The impact of this policy shift quickly affected the policy directions of key government partners, notably DOE. Although DOE has not demonstrated an unyielding position on the country's INDC/NDC, it has expressed serious reservations and made no commitment on behalf of the energy sector with respect to mitigation actions.

Similarly, the outcome of the 2016 U.S. presidential elections posed a steeper challenge for the project. The current U.S. Government not only withdrew its commitment to the Paris Agreement but allocated no budget for CE. Because B-LEADERS focuses primarily on climate change, funding in its last couple of years became uncertain. The project needed innovative approaches such as forging partnerships with government and the private sector to conserve remaining funds until fresh funding can be secured for future activities.

In addition, 2016 was marked by serious disruptions in the work flow of key government partners. The Philippine elections resulted in changes at the helm of CCC twice in the last year. CCC is the lead implementing government partner under the USAID-led EC-LEDS program. The changes led to a slowdown in major activities in the CCC, including the enhanced CBA study.

The suicide of ERC Director Francisco Villa shocked the energy sector. Director Villa committed suicide after allegedly being pressured to approve procurement contracts without the proper requisite bidding and procedure. Intense media coverage of the scandal led to the call for the resignation of the chairman and all the commissioners by the Philippine President. This tragic event culminated with the dismissal of the ERC chairman and, just recently, long suspensions of the remaining four commissioners over alleged anomalous power supply deals. In light of this uncertainty, B-LEADERS considerably curtailed its technical assistance to ERC.

B. ISIS SIEGE OF MARAWI CITY AND MARTIAL LAW IN MINDANAO

The attack of the ISIS-Maute group in Marawi City in May 2017 triggered a declaration of martial law on Mindanao Island. Project activities under the approved work plan were disrupted and constrained when U.S. national technical experts were discouraged from traveling to Mindanao. B-LEADERS had to rely on nationals to maintain activities that were conducted in partnership with MinDA. Moreover, the project had to curtail workshops and training in Mindanao because of the heightened security risk after the siege.

Nevertheless, partnerships with NGAs, LASURECO, and the communities helped in accomplishing the project's activities in its last year. These developments contributed substantially toward the goal of restoring electricity services and strengthening the energy resilience of Marawi, especially considering the institutional and political dynamics in the area.

C. MULTIPLE DONORS

Multiple donors are engaged in implementing development assistance in the Philippine energy sector, specifically in the CE space. Given the overlapping interests not only with other donor agencies but also with USAID-funded projects, it was important for B-LEADERS to secure high-value, high-impact activities such as the CBA Study that became the foundation for the Philippines' INDC, the Water-Energy-Nexus Study, the *LGU Guidance Manual on GHG Inventory,* and the mitigation component of LCCAP, to name a few. B-LEADERS relied on its earned reputation in the sector for reliability, credibility, and quality output.

The presence of multiple donor partners required strong coordination, networking, and diplomacy, and challenges inevitably emerged in managing the donor partnerships. However, these relationships offered the opportunity to form new mechanisms for collaboration and cost sharing.

D. CONSTRAINTS IN FUNDING LEVEL AND MULTISOURCE FUNDING

B-LEADERS successfully achieved key performance indicators within the base period despite the shortfall in obligated funding. As previously stated, the CE sector is not a priority for the current U.S. Government, so funding became a challenge. However, B-LEADERS forged cosharing agreements, particularly with government agencies such as DOE and the CCC, which were willing and able to cover the team's travel-related costs and workshop expenses. The country clearly needed the technical, organizational, and facilitation expertise of the B-LEADERS team.

The constraint in funding from the traditional USAID sources for mitigation projects meant that USAID had to search for existing funds to help bridge-finance the project. To date, B-LEADERS is funded through multiple mechanisms that require their own set of performance indicators. This multisource funding arrangement required a rapid assessment of potential activities tempered with due diligence to ensure that the project complies with the major terms and condition of its contractual agreement with USAID. Moreover, because each funding mechanism has specific uses, the project was challenged to keep track of expenditures in financial reporting to USAID as required.

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