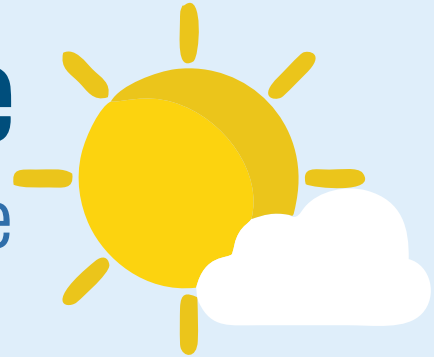


# REImagine a Bright Future

Another power is possible



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Center for Empowerment, Innovation, and  
Training on Renewable Energy

## **REImagine a Bright Future: Another power is possible**

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**REimagine a Bright Future** is a collection of stories about the different ways of achieving energy access for all, especially in poor, rural, or geographically-isolated areas. This book narrates the use and development of indigenous, clean, and renewable sources of energy. It also highlights the importance of collaboration among stakeholders and the empowerment of communities.

With surging electricity costs and the need to address climate change, “energy for all” has become a mantra and a mission by and for stakeholders. However, energy for all is not only about availability, but also about affordability, reliability, and sustainability.

As of 2018, close to 2.4 million households in the Philippines practically remain in the dark. The number may even be higher if rising prices of goods and unreliable power supplies are considered, as these also affect people’s access to electricity.

Energy is vital in economic development.

But more important is its role in realizing full human potential and in providing security in homes and communities.

Through renewable energy, people in marginalized communities can improve their quality of lives; they can use electricity for lighting, information and technology, recreation, and other livelihood opportunities, among others.

Inspiration and lessons drawn from the narratives in this book will hopefully prompt readers to start or improve current RE practices in their respective areas.

Ultimately, this story collection aspires to contribute to the acceleration of RE development and deployment in the country.

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# GREENPOWERING BENGUET

By Wilson Fortaleza

Wilson Fortaleza is a founding fellow of the Center for Power Issues and Initiatives (CPII). He also serves as the spokesperson of Partido Manggagawa.

## **Introduction**

A three-megawatt (mW) hydropower facility — which can energize hundreds of homes — is expected to operate soon in Buguias municipality in the province of Benguet. Construction of the Man-asok minihydro power project is already in full swing and ready for commissioning by December 2019, according to Ms. Merlie Landocan, who was assigned by the Benguet Electric Cooperative (BENECO) to manage the project.

This, definitely, is good news, even in a province where building hydropower plans are no longer something new. Such facilities, after all, have been built in Benguet since the 1950s. However, it's different this time around. The Man-asok facility will be owned and managed by the electric cooperative and its host community, an innovative approach whose time has come. This arrangement is just one of BENECO's several initiatives to pursue its vision of greenpowering Benguet.

The project will help BENECO take advantage of the province's vast

renewable energy resources, believing that its efficient use, combined with prudent management, will not only cut electricity costs but will empower communities over the long term.

To skeptics, the 3-mW facility matters little since it can only cover a fraction of BENECO's growing load requirement of close to 80 mW. But for BENECO's General Manager Gerry Verzosa who relentlessly steered this project into motion, the Man-asok project is but just one step towards something bigger and better: that of making the energy system in the Cordillera region more sustainable.

To this end, the electric cooperative, in its general assembly in December 2016, amended its Articles of Incorporation and By-Laws and included generation as an additional business. The coop's leadership believes — then and now — that Benguet can ensure its sustainable future by harnessing the full potential of its resources. Hence, for BENECO, the Man-asok hydropower project is just the start of its ambitious shift to renewable energy.

## Cool and green Benguet

During the 1950s to the 1960s, the National Power Corporation was able to build two major hydropower projects in Benguet, thanks to the province's watersheds and rich river systems. These facilities are the 105MW Ambuklao and 140MW Binga plants, located in Bokod and Itogon towns.

Ironically, these plants, now under Aboitiz Power, do not directly serve nor benefit the Cordillera people. The facilities have been assigned for peaking and ancillary services for the Luzon grid. In fact, BENECO's currently gets all of its power from coal.

However, Ambuklao and Binga are mere fractions of the province's hydropower potential. Benguet and the Cordilleras hold more than two thousand megawatt of hydropower potential, according to hydrological studies.

Meanwhile, its mountainous landscape and cool temperature continue to make Benguet one of the country's top tourist destinations.



*An aerial view of the site and the ongoing construction work for the Man-asok minihydro power project located at Barangay Sebang, Buguias, Benguet. Photos from the website of the Benguet Electric Cooperative (Beneco).*

According to reports, Baguio City, the province's premier city, posted 1.7 million tourist arrivals, with 1.149 million of them visiting during the first half of the same year. Baguio also hosts an economic zone where IT and other manufacturing firms operate. The province also hosts three large mining companies (Benguet, Philex, and Lepanto) as the region is rich in minerals like gold, copper, limestone, and pyrite.

For its part, agriculture — including cattle-raising and vegetable-growing — provide most jobs in the province. Providing energy to this eclectic mix of urban, industrial, and rural consumers in a mountainous environment is no doubt a challenging mission for an electric distribution utility. It is a mission that Beneco has carried and continues to carry out.

### **Best cooperative**

Of the country's 121 electric cooperatives, BENECO has consistently ranked as one of the best in terms of operational performance. As of December 2018, total assets were

valued at ₱3.584 billion. Gross revenues were at ₱2.571 billion as total energy sales reached 418,355,380 kWh in the same year. Its new and modern headquarters in South Drive Baguio is equipped with the Scada system which runs real time data monitoring of its whole distribution structure.

During the 2017 National Electrification Administration's (NEA) National Lumen Awards held in Tagum City, it captured eight national efficiency awards. These include Single Digit System Loss for the Year (9.08%), Lowest Power Rate (₱7.1292/kWh), Best in Collection Performance (100%), Model Headquarter Facilities, Triple A Category, Certificates of Recognition for participation in Task Force Kapatid for victims of Typhoon Lawin and Nina, and Exemplary Management award for the General Manager.

BENECO is led by GM Gerry Verzosa. Its Board President is Rocky Aliping. It has a total of 128,380 members who are properly represented in the General Assembly and their



institutional formations under the Multi-Sectoral Electrification Advisory Council (MSEAC) organized per district. All its 244 workers are not only regular employees, but also are one of the best paid in the industry. They are represented by an active labor union and enjoy a good labor-management relations mechanism called "ASPULAN", an Ibaloi term which means "to gather or a gathering place to conduct activities or arrive at agreements on relevant matters."

Organized on October 5, 1973 as a non-stock/non-profit cooperative and granted 50-year franchise on March 20, 1978, BENECA has proven itself capable of fulfilling its mandate to provide total electrification for its franchise area. In 2012, it has already achieved 100% barangay electrification and is currently in the process of completing its *sitio* electrification program. With these impressive achievements, it is high time for BENECA as an organization to realign its vision with the new imperatives of our planet and our communities.

As mentioned earlier, the 3-mW hydropower project matters little to

those whose only metric for performance is limited to power supply and profitability. But for those whose vision extends to greenpowering Benguet and empowering its people, BENECA's Man-asok project is more than just a laudable social initiative. It is the wave of the future.

### **The Man-asok Minihydro Project**

Once completed, the Man-asok facility — BENECA's first initiative to generate its own power — is expected to produce energy for its 'own use'. The term 'own use' refers to a contested legal concept in the unbundled power sector where cross-ownership to a certain extent is prohibited.

Under the Electric Power Industry Reform Act (EPIRA), a utility can only be a generator, a grid operator, a distributor, or a supplier. An electric cooperative (EC) is a distribution utility and, as a result, cannot simply venture into generation. But according to GM Verzosa, the coop's decision to move into RE generation stands on solid legal ground. He cited, for instance, Sec. 15. Chapter III of

Presidential Decree (PD) 269 which mandates an EC not only to distribute and sell, but also **to generate** power.



The Renewable Energy Act (RA9513) under Sec. 6 of Article III also encourages **all stakeholders** in the power industry **“to contribute to the growth of renewable energy industry of the country.”**

And lately under the NEA Reform Act (RA 10531), specifically paragraph (j-1) of Sec. 16 in Chapter III, ECs are authorized **“to construct, acquire, own, operate, and maintain generating facilities within its franchise areas.”**

Finally, on October 23, 2019, the Department of Energy (DoE) granted BENEKO a Hydropower Service Contract (No. 2009-10-30) for Manasok. After securing the needed FPIC [Free Prior and Informed Consent] from the BADANG IP [Indigenous People's] Group and approval from the local government units (LGUs), the project broke ground in November 2016. Construction began a year later.

However, meeting legal requirements was the least of **Beneco's** concerns when it decided to go into self-generation.

For the coop, the move to produce its own clean energy was also a step toward empowering their local host communities. This desire is clearly manifested in the November 6, 2017 letter by **BENECO Board President Rocky Aliping** to DoE Secretary Alfonso Cusi:



“

**BENECO, for one, has been bold enough to take the track of renewable energy. But unfortunately, there are investors within its area that has beaten it to the draw in the acquisition of hydropower service contracts (HSCs). Then so be it. Only that the electric cooperative, or for all ECs similarly situated, must be given the opportunity to directly challenge the HSCs of the private developers. Not that BENECO wishes to have the HSC cancelled. The desire is to allow the EC to consult and negotiate with the affected residents and provide its own version on how to develop the renewable energy resources of the community covered by the HSC of the private investor.**

**The people must be given the opportunity to choose and compare the project of the project developer with that of the electric cooperative in terms of the benefits the people deserve to receive considering that the renewable energy resources to be tapped for use are within their domain. Here, there is a need to understand the import of ECs as franchise owners vis-à-vis ancestral domains pursuant to the Indigenous Peoples Right Act (IPRA).”**

In the letter, President Aliping asked the DoE to review its policy on the issuance of hydropower service contracts (HSCs). These contracts were granted to private investors to develop RE “in an area they have never gone to” or which falls within the coop’s franchise area, Beneco said.

The coop also stood firm on its position that electric cooperatives, and in this particular case, the IP communities, must enjoy preference for developing the renewable energy resources available in their franchise areas. Sadly, Secretary Cusi did not even respond to President Aliping’s letter.

This appeal for policy review and reform remains urgent for BENEKO because aside from the 3-mW Man-asok project in Buguias, Benguet, it was also able to secure an agreement with the IP organization of Kabayan, Benguet for a possible joint venture for 20-mW minihydro projects along the Agno river. Unfortunately, the HSC for Kabayan rivers was acquired earlier by a private developer affiliated with big power.

This particular issue was exhaustively discussed during the Conference on Exercising the Green Energy Option held in Baguio City in September 2017. Hosted by BENEKO, the conference was attended by officers and members of the cooperative, consumer groups, representatives of LGUs, the DoE, and national advocacy groups on renewable energy and energy democracy. The conference later agreed to launch a campaign to reclaim the rights of communities to develop their own renewable energy resources.

### **Benefits to host community**

Once allowed to challenge the HSC of private developers, Beneco is confident that it can readily beat or match them in terms of benefits it can offer to consumers and its host communities. For instance, the ₱470 million Man-asok hydropower project offers a package of benefits which Beneco believes no private investor can top. In general, the project aims to:

- Provide low cost electricity;

- Provide a "game changer" model of local, sustainable energy-based community development which will lead to financial and economic freedom or rural communities without government funding via partial ownership of the asset forever;
- Promote the development of sustainable hydro power resources;
- Provide employment opportunities for rural communities during construction and operation of the power plant;

Moreover, under the coop's financial feasibility projections, consumers will be charged a generation cost of P5.38 to P5.44/kWh for twelve years until loans to the Development Bank of the Philippines are settled. After the debts are paid, the rate will go down to as low as ₱1.50/kWh.

But that's not all. BENECON will comply with the mandated benefits due to host communities provided under EPIRA (₱0.010/kWh), Real Property Tax,

Business Tax and Local Fees and Permits, Watershed Management Fund (₱0.005/kWh, and share from the National Wealth Tax (1% of annual gross income).

To top it all off, BENECON also volunteered to offer additional financial benefits such as an average of ₱0.26/kWh for Buguias and a Restricted Fund of ₱0.01/kWh which can be advanced for the LGU's community projects.

And finally on the 26<sup>th</sup> year, the LGU of Buguias shall acquire 50% ownership of the assets of the facility.

If these benefits can be matched by private developers, then there's no point for anyone else to contest the business model of these known industry players, Versoza said.

### **Transition to 100% RE**

Benguet's total renewable energy potential is 30 times larger than what BENECON needs to meet its current demand. This is according to Engr. Aldwin Camance, who completed a

commissioned study for labor unions on the renewable energy potentials within the electric cooperatives' franchise areas.

The study showed an estimated 2,244 mW of hydropower potential in the franchise area of Benguet, Camance said. Total installed capacity in the area at present is 298 mW only. By adding the installed capacity, Benguet province's total RE potential would increase to 2,542 MW.

In 2018, BENEKO's peak demand reached 79 MW. In short, sources of renewable energy from within BENEKO's franchise area are more than enough to support its present and future electricity requirements.

The question, therefore, is no longer whether Benguet can go 100% green but whether BENEKO can achieve this vision in the face of obstacles hindering the development of renewable energy in the country.

Currently, the 3-mW Man-asok hydropower facility in Buguias is the only project Beneco can claim since

the rest of the rivers and watersheds in Benguet remain a battlefield between communities and private developers.

So far, a total of 32 hydropower service contract certificates have been awarded by the DoE to private developers in this area. Most contracts were acquired by Aboitiz-led companies like Hedcor and SN Aboitiz Power. Some contracts such as Beneco's Man-asok project are already active while many are considered non-compliant.

BENEKO is eyeing another 20-mW project in Kabayan, Benguet but as mentioned earlier, the HSC for Kabayan was awarded to Hedcor Benguet, Inc. in 2015 despite opposition from IP communities.

In October 2017, these indigenous groups have asked the DoE to cancel the contract but the petition has yet to be acted upon by Secretary Cusi. For its part, the National Commission on Indigenous Peoples — an agency mandated to protect IP rights — has acted on a petition filed by a group, the *Onjon Ni Kasikuran Shi Kabayan*

(Onkaska) that opposed the Kabayan 2 project, previously Nalatang B of Hedcor Kabayan, Inc. (formerly Hedcor Cordillera, Inc.) (This is different from the Kabayan 1 project that was also opposed by Onkaska, a duly registered organization representing the Ibaloys, Kankanaeys, and Kalanguyas in Kabayan municipality in Benguet.)

The NCIP decision will be forwarded to DoE for appropriate action.

### **Other RE projects**

BENECO plans to develop several other minihydro power plants, according to Landocan, the project manager for the Man-asok facility. Besides being able to secure its own supply and comply with the requirements of the Renewable Portfolio Standards (RPS), the move also plans to target selling excess generation to the Renewable Energy Market (REM).

Sales revenues from REM will be used to further reduce generation costs passed on to member-consumers, she said.

“If the minihydro plant would be qualified under FIT, the margin would be used to fast track the payment of loan. Thereafter, BENECO will use the margin to reduce the cost of generation. Given the available potential of 2,244 MW for minihydro, it is possible to attain zero generation cost for consumers should Beneco be able to develop even just 7% of the potential,” said Landocan.

Although minihydro is the preferred RE for development in Benguet, Beneco is also looking into the viability of solar power.

To this end, it submitted its intent to participate in the Rural Network Solar (RNS) Project of the National Electrification Administration (NEA). BENECO is one of the qualified electric coops that was chosen to benefit from a \$1-million subsidy from the European Union (EU) equivalent to a 1-mW solar power plant. In addition, BENECO through the efforts of its Board of Directors, entered into a Memorandum of Understanding with the Arlington, Virginia-based National Rural Electric Cooperative Association for the installation of a 10-mW plant through a separate grant.

Also part of the coop's greenpowering program involves coordination with National Irrigation Administration (NIA) for the co-utilization of irrigation structures for power generation.

Despite taking bold, impressive steps to shift to renewable energy and at the same time, empowering its communities, BENECA doesn't want to do this alone.

Together with other electric cooperatives in the region, they formed the Cordillera Region Cooperatives' Association (CRECA) to develop renewable energy power plants in Abra, Benguet, Ifugao, Kalinga, Apayao, and Mt. Province.

### **Making power generation clean, sustainable, and a non-profit business**

The goal is to adopt the BENECA model of making the shift to clean energy, power supply sustainability, lower power costs (to zero), better benefits to the community, and additional local employment and empowerment of the IP communities.

By pursuing these goals, they will surely be up against the giants in the power industry. These are the same players which have gained control of their renewable energy resources despite obvious conflicts of interest because they are also involved in coal power.

And producers of coal — the dirtiest fuel — can never be green, according to Landocan.

Page 16 of 9 Benguet and its IP communities should therefore not consider these corporations as partners in their development, let alone allow them to use their resources. After all, BENECA, Benguet's very own electric coop, is thriving.

It remains successful at doing what it does best: making power generation a non-profit business.

More than that, BENECA is also world-class organization well-equipped to give energy democracy a chance to flourish in this part of the globe.



# UNCOOL TO USE COAL:

A school uses solar to power  
its aircons, computers



St. Anthony's College on Panay Island had a dilemma.

The Catholic school in Antique province, located more than 500 kilometers southwest of Manila, wanted to install additional airconditioners in its facilities.

Students requested them, teachers needed them, and the school officials themselves saw the installation of aircon units as necessary. Everyone felt that they could use a little bit of cool in their part of the world, literally, if not figuratively. After all, warmer temperatures took their toll on students and teachers alike: it made learning less enjoyable and productive than it should be.

The school, which occupied five hectares of land, could easily acquire additional airconditioning sets. The catch, however, was their electricity costs would skyrocket once the units were operational.

“We wanted to add airconditioning units but we could not afford to,”

Father Edione Febrero, St. Anthony's College President, said. “It would have made our bills even bigger and we didn't want that at all.”

As things stood, the school was already struggling to keep energy costs down. To cut consumption, authorities were prompted to close its library and audiovisual room during weekends. Management also limited students' access to its computer laboratories.

In one way or the other, the high costs of electricity affected the learning opportunities of the school's 4,164 students and the productivity of its 215 employees.

However, the huge electric bill wasn't the only thing that held back the school's move to acquire more airconditioners.

St. Anthony's College was more concerned about the source of energy itself. And Antique, just like Manila and the rest of the country, remained mostly dependent on coal.

“St. Anthony's College is an institution that carries a clear anti-coal advocacy,” Fr. Edione explained. “For years, we have done our best to convince as many people as possible to resist coal and the establishment and operations of coal mining plants. It is hard to convince people that coal mining and coal-fired power plants are bad for human health and the environment; it's really an uphill battle.”

Fr. Edione knew what he was talking about.

The school's president as well as other members of the community witnessed firsthand the devastating consequences of coal use on Semirara Island, which is located more than a hundred kilometers northwest of Antique.

And this explains why coal use wasn't cool, as far as St. Anthony's College was concerned. “We wanted to shift to energy sources that are cleaner and safer than what the coal plants produce,” Fr. Edione said.

## “Solarizing” St. Anthony's College: A response to Laudato Si'

It didn't take long before St. Anthony's College arrived at a solution to address its high energy woes. It entered into a partnership with WeGen Distributed Energy Philippines, a Pasig City-headquartered company that provides renewable energy solutions to homes, schools, and even entire islands.

The partnership resulted in the installation of a 70.68 kWp solar PV system on the rooftops of St. Anthony's College.



The partnership fit each party like a glove. For one thing, the project looked like it was practically tailor-made for WeGen Laudato Si', a subsidiary named after and inspired by the second encyclical of Pope Francis.

In all of its projects, the WeGen unit — like its parent — observes high environmental standards and practices that adhere to Laudato Si' (Praise Be to You), published in June 2015.

The encyclical scored environmental degradation and global warming and called on people around the world to take swift, unified action against climate change. With this in mind, WeGen Laudato Si' has reached out to schools and other educational institutions by holding classroom discussions on solar technology, the importance of battling climate change, and the urgent need to shift to renewable energy sources as a means to save the planet.

WeGen Laudato Si' has also established strategic relationships with most of the 85 Catholic dioceses covering the entire Philippines to help them generate clean and sustainable

solar power on the rooftops of their churches, schools, seminaries, and other church-owned buildings.

These institutions include St. Anthony's College in Antique. In April 2019, the school became solar-powered.

### **More than just a rooftop installation**

The school's energy consumption was based on data captured from power loggers that were staged in the school premises. The initial consumption profile for St. Anthony's College was a baseload of 20kW throughout the day until night.

“WeGen presented them with an option to go green and save energy, and they took everything we explained to them about solar energy and how their solar PV system works, and acted on their own to be more energy efficient,” the WeGen engineer that led the project said. “This is proof-positive that projects like these can and should be venues of collaboration between companies like WeGen and clients to develop environmental awareness.”

In short, St. Anthony's College didn't just get a solar PV system installed on their rooftop — it helped make the school more energy-efficient. “They themselves made efforts to do research on what else they can do with the system. The system itself is dynamic, and the school authorities took the initiative to determine means to improve it further,” WeGen's engineer added.

Currently, the school is in the process of shifting its electricity load and maximizing the balance between their consumption and generation, according to Fr. Edione.

“We want to determine how else we can move our energy consumption load/appliances to the areas covered by the solar PV installation (i.e. which ones are powered by the panels),” he said.



and took drone shots and videos. Soon after, the design for our rooftop was put together, and construction was underway. The company and the team that handled our project not only explained the technical requirements for the installation, but also its benefits. We understood that we weren't just going to cut our electricity costs, but we were also helping bring down our school's carbon footprint. By lessening our reliance on electricity generated by coal-fired plants, we contribute to efforts to save the planet. It might be a small effort, but many small efforts when combined still count," he said.

### **Going solar: a win-win situation on all fronts**

Fr. Edione also expressed appreciation for WeGen's monitoring app which is used to track the school's electricity consumption and the solar PV system's operation.

"It's a very effective and handy tool because it helps us manage the solar PV system more efficiently," he said. "I

like how even if I'm far away from the school, I just need to open the app on my phone and I can see how the solar panels are working and how much power it's generating," he said.

He also shared that the installation of the solar PV panels has led to behavioral changes among the students, as well as the faculty and non-faculty staff.

"After the panels were installed, more people here have become aware of solar power and why it's a viable alternative to traditional energy sources. For instance, we know that we should only turn on the aircon units when the sun is up, and we can use the aircon so long as the sun is in the sky and our panels are absorbing its light and converting them to energy. We are all intent on maximizing the electricity we get from the panels, and lessen our consumption at night," he said.

Ultimately, Fr. Edione said that going solar led to a win-win situation on all fronts for St. Anthony's College.

## **The sun makes the school cool, literally**

Since the school installed the solar PV system, it has enjoyed savings of P50,000 on its electricity costs per month, and it has been able to install an additional 12 airconditioning units.

Airconditioners have already been installed at the library, allowing students and faculty to enjoy the cooler atmosphere.

Similarly, the administration building and its many offices and the senior high school building and its classrooms have also benefitted from the electricity generated by the solar PV system.

It has also enabled St. Anthony's College to keep its library and audio-visual room open during weekends and charge fees for non-students and non-staff using the computer laboratory.

Additional income from these fees provided more funds for airconditioning units in other rooms used by students and faculty members.

Future savings will also go towards improving school facilities.

The school is also exploring plans to open a weekend laundry shop for students and the school staff, and possibly a bakery.

St. Anthony's College also wants to assess its options for system expansion which includes installing more panels and integrating a storage system for all the excess energy the solar PV system generates.

“We are in constant contact with the WeGen Technical Group which continues to give us tech support and answer all our inquiries. We are very proud of our solar PV system, and we teach the importance of shifting to renewable energy such as solar to our students, faculty, and non-faculty staff,” said Fr. Edione.

The actual solar panel installation process was also an eye-opener for Fr. Edione. “I was surprised when I saw how easy and straightforward the whole process was. The WeGen team went to our school, conducted the assessment with technical engineers,



# MICRORENEWABLES POWER COAL-AFFECTED COMMUNITIES

By Riedo A. Panaligan

Engr. Riedo A. Panaligan is president of the Center for Renewable Energy and Sustainable Technology (CREST). He is a renewable energy project developer and a certified green energy finance specialist.



Micro-scale renewable energy systems or microrenewables are clean, affordable, and can be easily installed to meet the energy needs of rural communities and households. Through partnership with the local community and the public environmental defense organization Tanggol Kalikasan, the Center for Renewable Energy and Sustainable Technology (CREST) deployed solar photovoltaic (PV) systems in marginalized communities whose health, environment, and livelihood threatened by coal-fired powered plants in Quezon province.

Quezon province is host to at least four coal-fired power plants in the country. The one expected to start operations this year is facing strong opposition from communities due to hazards these fossil-based energy source pose to the lives and livelihoods of local people. Further, despite huge installed capacity of these coal plants which is more than enough to power the province's energy demand, there are communities that remain in the dark, unenergized.

The island community of Cagbalete continues to lack electricity access although being located adjacent to the Mauban Coal Power Plant, which has been in operation for more than 15 years. Instead of electricity, the residents received black ashes, and overpowered by a foul stench emitted by the plant. Black particulate matters originating from the facility aggravated respiratory conditions of children, the elderly, and people with special needs. Boats and beach sand turned black affecting fishing and tourism, the two major livelihood sources of the community.

Further, electricity remains intermittent in the coastal communities of Barangay Ibabang Polo in Pagbilao and Barangay Caridad Ilaya in Atimonan. These communities composed mostly of poor families of laborers, farmers, and fisherfolks are paying a high grid price of Php 12 per kilowatt-hour, at the minimum, for substandard electricity services. Farming and fishing activities deteriorated over the years due to the coal-fired power plants' operations.

These communities have been suffering from years of exposure to polluting coal-fired power plants.

Now, they are in the frontlines, opposing the proposed new and expansion of existing coal-fired power plants in the province of Quezon. They have experienced first-hand the devastating impacts of dirty energy, the false promises made by coal peddlers and extreme marginalization. They are crying out: “No to Coal!” and are ready to embrace clean, renewable energy.

### **Renewable energy systems – a must to address energy gaps**

Having renewable energy systems was identified by the residents as critical in addressing energy gaps, securing adequate electricity, and increasing the communities' sense of security. With the help of non-government organizations, the locals are on their way to realizing the solution to their pressing concerns. Tanggol Kalikasan has been supporting these communities in their struggle towards a clean and toxic-free environment. CREST, as the technical partner



organization, assisted the communities in the design, procurement, and installation of the systems.

More than 30 small fisherfolk families practicing the artisanal fishing method called “pagkikitang” in Barangay Caridad Ilaya are now enjoying the benefits of a solar-powered cooling system in the form of a 19-cubic meter chest freezer.



CREST selected an energy efficient cooling unit utilizing R290, a non-toxic refrigerant grade propane with low-global warming potential. The chest freezer is powered by a 660W solar PV rooftop system. The chest freezer produces ice used by community members to preserve their daily catch. The fish lasts longer, raising the families' income.

### **Basic solar home systems transform lives of fisherfolk families**

Twenty (20) unelectrified small fisherfolk families in the coastal barangays of Cagbalete in Mauban and Ibabang Polo in Pagbilao received basic solar home systems from the two organizations. The solar home systems have the capacity to power two LED lights for 10-12 hours and charge mobile phones and other small DC devices such as DC fans. Community leaders assisted the staff and volunteers of CREST and Tanggol Kalikasan in roof mounting the solar panels and wiring of the electrical systems inside the house.



### **Small is Beautiful: the microrenewables**

A microsolar to light up the unenergized Bantay Gubat ranger station in Mt. Banahaw-Cristobal National Park and an isolated upland elementary school in Barangay Ibabang Palale, Tayabas City is an evidence of how a small project can make a big impact in an area. This microsolar is just one of the positive results of CREST-Tanggol Kalikasan partnership in rural communities.

Quezon has a vast renewable resource that remains untapped and unutilized. CREST aims to demonstrate more small-scale systems in the province that will harness the province's hydro, wind, and biomass resources. It aims to deploy a field study site for microhydro in the province – to demonstrate its “pump-as-turbine” system that utilizes off-the-shelf components and could bring down the cost of hydro to less than Php100,000 per kilowatt.

Even organic materials are energy sources that can be beneficial to a community. CREST's work on

anaerobic biodigesters, a system that converts manure and biodegradable materials into clean fuel and fertilizer, can benefit livestock farm owners and prevent land and water pollution and contamination. Small biogas projects can also be deployed in urban barangays to manage the huge volumes of biodegradable wastes coming from markets, restaurants and residences.

# THE MALALISON ISLAND SOLAR HYBRID MINI GRID:

## A Case of Democratizing Solar Energy for Small Rural Islands

By **Ricardo C. Alindayu II**

Ricardo Alindayu II is chief technology officer of Cloop, a social enterprise aiming to build micro-recycling facilities around the Philippines. He is a graduate of chemical engineering from the University of the Philippines Diliman.



Common to the Philippines as an archipelagic nation are small, rural islands located offshore from larger, more urbanized mainlands.

Often, these islands pose many challenges to the quality of life of its residents owing to its isolated geographic location. One such example is the 55-hectare island of Malalison, a 15-minute boat ride away from Antique Province on the major island of Panay. The island is home to around 160 to 200 households and is under the jurisdiction of the municipality of Culasi in Antique. The major industries on the island are tourism and fishing, providing sources of livelihood for its residents.

Its white sand beaches and grassy hills have made the small island an alternative to the more popular Boracay Island near the province of Aklan. Owing to this tourism boom, several residents took advantage of this opportunity by opening up their homes for visitors to stay for the night. As a result, homestaying has become a major source of income for Malalison's residents.

Meanwhile, fishing is also another major enterprise because of the island's location near the sea. The island has been known as a fishing village long before its tourism opportunities have been tapped by residents and outsiders alike. Although these livelihoods provide some source of income for residents, expansion is often hindered because the island is at a distance away from Panay.

### **One government, two different worlds**

While Malalison Island shares the same governance as those located on the mainland proper of Culasi, the two areas are starkly different in terms of livelihood opportunities and basic services. The lack of infrastructure and robust transport services between the two areas have inhibited access to common services and economic growth on the island.

One particular example that illustrates this disparity is the diesel-fueled generator found on the island. The generator is the island's lone power source, providing electricity for only

four hours a day from 6PM to 10PM. This is in contrast to the mainland, which enjoys electricity services 24 hours a day, seven days a week. As a result, electricity is more expensive on Malalison Island, prompting the need for a more consistent and cheaper source of energy to spur economic growth in the area.

### **The island's 24/7 solar energy solution**

The conceptualized solution to the energy problem on the island is a solar energy-based project to supplement the current diesel-fueled power plant in operation. The main proponents for the project, which is formally entitled the “Malalison Island Solar Photovoltaic (PV) Hybrid Pilot Project” are the Antique Electric Cooperative (ANTECO) and the One Renewable Energy Enterprise, Inc. (OREEI), in partnership with the Asian Development Bank (ADB) and the municipality of Culasi, Antique. The Antique Electric Cooperative or ANTECO for short is a non-stock, non-profit electric cooperative in the Philippines.





ANTECO is in charge of electricity distribution in the 16-out-of-18 municipalities in the province of Antique, including Culasi as part of its network. The One Renewable Energy Enterprise, Inc. (OREEI) is a private company engaged in solar photovoltaic (PV) products and services for different applications. Both stakeholders have teamed up together in a public-private partnership with the municipality of Culasi to provide 24/7 energy supply to the island of Malalison.

The Asian Development Bank (ADB) has provided grants to the partnership amounting to \$200,000 as part of its *Energy for All* Program, an initiative for developing countries such as the Philippines to increase citizens' accessibility to more modern and clean forms of energy. The total cost of the project is \$500,548. ADB's two grants of \$100,000 each are for the solar PV power plant and the prepaid metering, while the remaining balance for energy generation was provided for by ANTECO (\$125,474) and OREEI (\$175,074).

The project includes a 50 kWp (kilowatts-peak) hybrid mini-grid solar power plant which converts the sun's radiant energy into electrical energy. The kilowatt-peak refers to the maximum capacity that a photovoltaic system can provide under standard conditions. The electrical energy from the solar PV panels are sent to an inverter which converts the direct current into alternating current so that it may be distributed through ANTECO's distribution lines.

Households in the island availing of the service are equipped with a smart meter where they can monitor their energy consumption. The solar power plant is paired with the existing 54 kVa (kilo-volt-ampere) diesel generator, in partnership with Electronic Life Technology, to maximize both equipment for 24/7 access to electricity. The kilo-volt-ampere is used to describe the apparent power of the diesel generator. Any excess energy produced is sent to 278 kWh lithium-ion batteries so that it can be used in the future.

## **Monsoon hampers solar plant construction**

Setting up the solar PV power plant in the island has presented itself with unique challenges mostly as a result of its isolation from the mainland. The construction of the power plant involves the delivery of large equipment. The lack of large shipping vessels such as barges were unavailable, making bamboo rafts the only options. The rafts needed to be reinforced with plastic barrels to prevent the equipment on board from sinking. The tide schedules were also considered when loading and unloading the equipment from the rafts. Difficulties were encountered when equipment was unloaded during low tide because the water level was lower than the dock.

Construction of the power plant was also hampered by the effects of the southwest monsoon or the “habagat” winds. The waves in the channel were strengthened by the monsoon, causing construction to be delayed. The lack of carrying vehicles such as trucks and lorries on the island also presented a challenge for transporting the equipment from the shoreline to the project site. More than twenty men had to carry the equipment such as battery cells, genset, and solar panels.

For construction of the power plant itself, cement and aggregates had to be sourced from Culasi rather than quarried in the site itself due to laws that prohibit quarrying in protected areas. Additional costs were incurred to transport the cement and aggregates from the mainland to the project site.



### **Solar project's innovative prepaid billing system**

However difficult, logistical challenges involving the project's construction paid off. After all, the Malalison Island project offered several innovations that distinguished itself from other solar energy projects.

One such innovation is its prepaid billing system that positively impacts all three types of stakeholders: the consumer, the operator, and the investor.

The consumer, which mostly comprises households on the island, have full control of energy use because of the prepaid system. The system also prevents monthly payments which can be a burden if income is insufficient.

The prepaid billing system is connected to their mobile phones, making it very convenient to pay for their bills. Subscribers receive an SMS every 5PM documenting their energy consumption. This was done in partnership with Smart as the telecommunications network provider.

For their part, the operators — ANTECO and OREEI — have increased efficiencies in meter reading, billing, collection, disconnection, and reconnection as a result of digitization of the system.

As a result of this prepaid system, the investors are assured a return on investment because the services are completely paid as soon as they are delivered.

### **Increasing solar PV use cuts diesel consumption**

Operation of the hybrid solar PV power plant began on December 2018, with solar production at around 135.40 kWh and genset production at around 335.65 kWh. During the start up phase, more power was generated by the genset.

However, the next three months painted a different picture. Around 1307.55 kWh was generated for genset production while around 1973.20 kWh for solar production for the month of January. The energy generation trend is shifting towards the use of the solar

PV power plant as opposed to the genset being used previously on the island.

For the month of February, around 6258.40 kWh was produced by the solar PV power plant alone. For the month of March, around 6030.20 kWh was produced by the solar PV power plant while around 51.60 kWh was used by the genset.

Not only is energy consumption moving towards a cleaner source of energy, but also energy consumption is increasing, highlighting renewable energy's reliability in the long run.

### **Lower energy costs allow higher food spending**

The shift to a more sustainable and reliable source of energy has positively impacted the two main industries of tourism and fishing.

Since electricity is more accessible as a result of this project, energy prices have gone down reasonably. Less money can now be budgeted for energy and transferred to other necessities such as food and education expenses.

### **Lower energy prices benefitted residents and their livelihoods.**

More income can be expected from improved services in the tourism and fishing industry. For the former, firewood had to be used for cooking food for guests prior to the introduction of the project.

Nowadays, other appliances can be used such as rice cookers, oven toasters, and other electric appliances. Light is now available as opposed to wick lamps which were used before. For the latter, freezers can be used for caught fish to preserve its quality. Other residents use the freezer to make ice candy, which can be sold for additional cash.

A more reliable energy source has also made services on the island more efficient. The earnings from entrepreneurial efforts increased as soon as power was made more accessible to the households of Malalison.

## **Ways Forward: Information and legislation are key to accelerate RE development and energy democratization**

Assess the implementing rules and regulations before entering into any business – this is the recommendation of OREEI president Mr. Erel Narida to those who wish to do a similar micro-grid project in the future. There are considerations in pursuing projects similar to the hybrid solar PV pilot plant. These include surveying the market, building the technology, preparing for any financial costs and assessing any regulatory provisions.

Often, others would think that technology would be the most difficult part. However, this may not be the case at present because of increased access to a wealth of data – the most important factor, as this provides an indication on the future and sustainability of the project. For example, the pilot solar power plant is now entirely owned by ANTECO in accordance with the current regulatory rules on ownership.

Looking forward, some legislative measures on the pipeline could bring in positive change in easing entry of energy industry players – such as Senate Bill No. 175 or the Microgrid Systems Act, and Department of Energy Circular for a national smart grid policy framework. Hopefully, these developments lead towards democratizing energy for the underserved in all islands, whether big or small, in the Philippines

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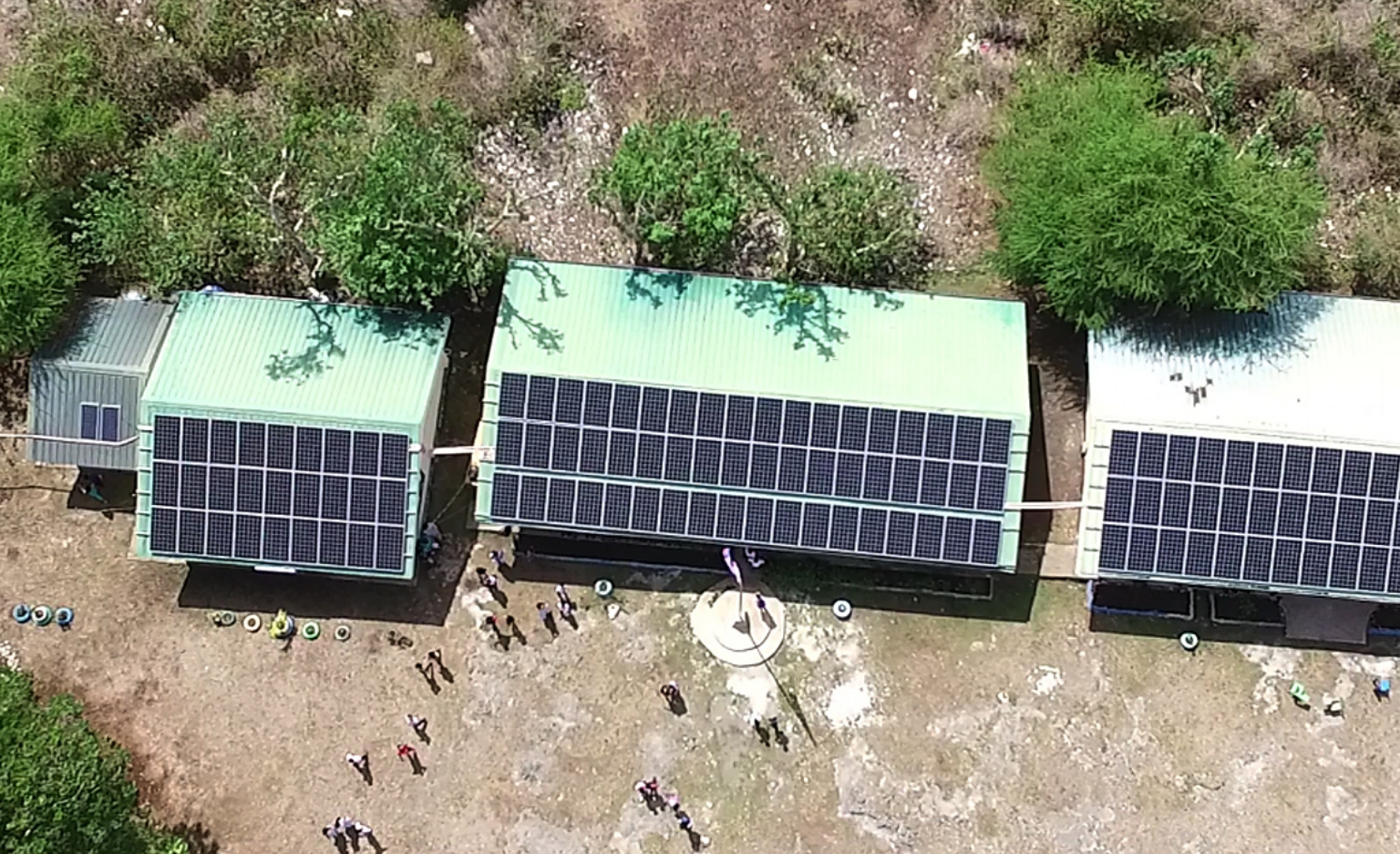
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# Malalison Island Solar Hybrid Power Plant Inauguration and Turnover

2019 Malalison Island, Antique Province



# KAHAYAG SA PAMILACAN

Kahayag sa Pamilacan, a project spearheaded by WeGen Distributed Energy Philippines on the island barangay of Pamilacan, in Baclayon, Bohol involves a donation of a 39-kWp solar photovoltaic rooftop installation and a 153 kWh battery storage system to provide daytime electricity for the island from 8 a.m. to 4 p.m.

The project sought to contribute to Pamilacan's social upliftment while providing proof of concept of the technical feasibility and resilience of solar PV systems on off-grid islands.

A year after it was launched in May 2017, WeGen assessed its impact, drew lessons, and identified opportunities in scaling its mission towards eradicating energy poverty in the country.

### **Island Life in the dark at Pamilacan**

Pamilacan is a 174.82 hectare off-grid island barangay located 15 kilometers from Poblacion, Municipality of Baclayon in Bohol province.

Based on 2015 statistics, its population is at 1,418, a decrease of four from the

2010 census. Its rich marine biodiversity was marred by a history of destructive fishing practices, prompting fishing bans while pursuing efforts to promote ecotourism.

To spur ecotourism, a diesel-powered generator was installed in 1996 to provide electricity from four o'clock in the afternoon to twelve midnight at a cost of PhP25/kWh (reduced to PhP8/kWh for inhabitants through subsidies under the National Power Corporation's Small Power Utilities Group).

Despite partially subsidized electrification, the barangay in 2009 still ranked highest in terms of the average level of deprivation in the municipality, based on the 12 core poverty indicators. Ninety percent of its population are unemployed, according to its Barangay Development Plan. The area also lacks a Barangay Climate Change Adaptation Plan, despite being a coastal community.

Different sectors, including the municipality, have extended assistance



to the Pamilacan community through initiatives on marine conservation, sustainable tourism, gender empowerment, and skills training.

WeGen, through its operating subsidiaries, sought to complement these efforts by increasing community access to clean energy through distributed energy resources, specifically solar power.

### **Introducing solar power on the island**

WeGen introduced solar energy to the island to help address its lack of electricity. The project had the following objectives:

- To increase the local community's access to clean and reliable electricity;
- To improve the quality of livelihood, education, and tourism on the island;
- To develop the skills of local volunteers in installing solar PV systems;



- To increase the local community's awareness on renewable energy and climate change.

Kahayag sa Pamilacan is the result of intensive dialogues with local stakeholders from the community and representatives from local and provincial governments. Key engagements began in December 2016 with officers of the local electric cooperative, Bohol I Electric Cooperative (BOHECO I), who recommended the project site, as well as with local government officials, including the congressional representative, governor, and barangay captain.

## **Project preparation**

Following the stakeholder engagement, the WeGen Team undertook a three-month immersion in March 2017 for technical and social preparation.

Project preparation involved the following:

- Site assessment;
- Training of local capacity in solar installation, referred to as “Overseas Pamilacan Workers” (OPWs);
- Stakeholder consultations;
- Community mobilization to form the local Barangay Power Association, Pamilacan Electric Consumers' Association (ECA).

BOHECO I provided the load profile of the 33 kWp diesel genset consumption. This served as the basis for the solar energy system design of 39 kWp with a 153.6 kWh battery, which left room for expansion.

The battery was set at 107.52 kW, usable with a 30% buffer, mainly to provide ancillary supply during low system production but which can also serve as back-up. It is a hybrid system installed on the local high school, which feeds into the island grid to complement the diesel generator by providing daytime electricity from 8 a.m. to 4 p.m.

The installation was officially launched on May 18, 2017, an event that also recognized OPWs who provided sweat equity to complete the project.

As of April 2019, estimated system production was at 74054 kWh, equivalent to carbon sequestered by 866 trees.

The project provided resilient energy when mainland Bohol's power supply was affected by the closure of Tongonan power plant in Leyte due to the July 2017 earthquake.

In October 2017, the Department of Energy (DoE) inspected the system, affirming its sufficiency, while also seeking to understand prospects for replication.

Based on these visits, the DoE funded the extension of the operations of the complementary diesel genset from 12 midnight to 8 a.m., thus providing 24-hour electricity on the island.

### **Household connections rise**

The project helped increase access to clean energy, boosting household connections by 42% from 2017-2018. It has also provided daytime electricity, which the DoE deemed sufficient for two years.

Shifts in spending on electricity bills across all income levels indicate willingness and capacity to pay more for additional eight hours of daytime electricity, reflecting affordability.

Continued provision of solar energy was also cited as the second highest progress the community would like to further see on the island, despite increasing monthly electric bills. These have also contributed to the Pamilacan Solar Credit Cooperative's pool of resources to cover its own operations.

Drawing from the findings, the team presented the following

recommendations on how clean energy access can power solutions to address Pamilacan's pressing developmental needs.

### **Increasing access to clean and reliable electricity**

Kahayag sa Pamilacan has contributed to increasing clean energy access in the community. This is indicated by the rising number of households connected to the grid since the solar PV installation. Residents have also recognized the extended availability of electricity during the daytime as the project's biggest contribution to the community. Electricity continues to be in demand, as indicated by the willingness of households in different income levels to pay for increased energy costs. This raises the possibility of introducing socialized tariffs for different establishments to ensure affordability for households while mobilizing resources to accommodate a demand uptick. Furthermore, clean energy transition is reflected in the shift of concern from mere access and availability to quality and stability of daytime electricity.

## **System expansion and energy efficiency**

The DoE's October 2017 inspection of the system affirmed that the system size can cater to 319 households at 35 kWp. It also noted that the system could provide sufficient supply for the island's growing power demand for the next two years.

However, in May 2018, just one year after the project was launched, the system started to overload due to higher energy demand that came with the annual “homecoming” fiesta. Household surveys and key informant engagement reflect the general community sentiment that the current output of the solar PV system is no longer sufficient for the island's needs. Associated concerns include risks of damage to appliances, as well as reduced collection of the Pamilacan Solar Credit Cooperative (PSSC) due to system unreliability.

It is also worth noting that the Pamilacan ECA counts 346 households as its members, 27 households more than the number

which served as a basis for the DoE report. While the inverter has the capability to switch automatically between PV and genset, a manual intervention was set up at the request of BOHECO.

In response, the barangay has taken measures to request council resolution to extend diesel generator operations so it can serve as a backup for the solar PV system, as needed. These underscore the need to monitor energy sufficiency, given increasing appliance ownership at the household level, as well as recent computer donations to the schools.

Systems expansion must also be considered in light of the overall vision to facilitate 100% renewable energy transition through decentralized energy systems on the island, while ensuring energy security amid diesel displacement.

Growing the seeds of Pamilacan's clean energy transition also requires an integrated approach. Energy efficiency must complement increased renewable energy access with the goal



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of carbon footprint reduction, minimized electricity bills, and power disruption, while uplifting its residents' quality of life.

### **Improving livelihood, education, and tourism**

The project proves that clean energy can help reduce inequalities by providing opportunities for socioeconomic upliftment through education, skills building, livelihood, and enterprise development.

By making electricity available during the day, economic activity was spurred. As a result, the number of households with a monthly income of PHP 15,000.00 and above has increased. Daytime electricity has also benefitted 27 businesses, including tourism and small, medium, and micro enterprises on the island through 1) additional product offerings and service amenities; and 2) improved quality of products/facilities and additional returns.

These additional earnings then provide capital for further reinvestment towards business expansion. These

have also contributed in gender equality through micro enterprises that stay-at-home wives and mothers can pursue while tending to their families.

Daytime electricity has also improved the quality of education in Pamilacan for both students and teachers through a more conducive environment for learning. Daytime electricity also opened new avenues for accessing teaching materials and made student assessments more efficient. Likewise, students are exposed to different teaching styles and tools for lesson delivery.

By making technology available, Pamilacan students no longer need to take additional computer training to keep them on a par with their mainland counterparts when seeking job opportunities.

### **Food-energy-water nexus and developmental opportunities**

Pathways for scaling the clean energy transition towards accelerated social impact in Pamilacan include solar-

powered facilities that address basic needs while boosting livelihood options.

Although cold storage at household level has eased food spoilage and the need to cross the seas often, a communal cold storage facility can cater to fishing and other cottage industries such as goat milk, as already started by two households. Food security can also be attained through cultivation of resilient local food systems.

With rice and corn crops being heavily affected by drought and climate change, solar-powered drip irrigation can play a role in reviving agricultural activity for food security as well as yielding additional produce for livelihood in the island.

Tourist arrivals and other economic activities can also be further boosted through improved water supply, which is a key development issue as revealed in the data collected. Above all, this pertains to residents' basic right to water, as they currently pay twice as much for mineral water. The need to

import drinking water from Baclayon drives the cost to Php50-60.00 on the island.

A desalination plant was already installed and tested to run from source to plant (sans purification). However, limited electricity hinders its full operation. The company also went out of business by the time daytime electricity was made available. Nonetheless, this opens up the opportunity to establish solar-powered desalination systems for the community. This would require technical testing for the existing desalination facility's functionality, as well as capacity building, and institutional arrangements for operations and maintenance. Further considerations include residents' capacity to pay as well as supply needed to power the system vis-à-vis other energy needs in the community.

It is also worth noting that a university student from Pamilacan was part of a team that presented desalination innovation at Sikat Impact Challenge in 2017.

### **Developing volunteers' skills for solar PV systems**

The solar PV installation training of the eight local OPW volunteers from Pamilacan has rendered them capable for stable employment with WeGen and other solar installers, as well as scaling green job conversion beyond Pamilacan through their work with new solar PV trainees. This will be further discussed in the impact assessment of WeGen's offshoot livelihood initiative, Lights Training Program.

### **Empowering the locals as active agents of transformative change**

Beyond technical capacity, social preparation efforts were also undertaken to raise community awareness of renewable energy and climate change. Both subjects have been integrated in the elementary and high school curriculum.

Recognizing the need for a holistic capacity building to ensure project sustainability, strides were also made for local empowerment and community organization by way of the

Pamilacan ECA/Pamilacan Solar Credit Cooperative. To ensure the cooperative's resilience, stakeholder cooperation and capital contribution empower consumers as active agents rather than mere donor recipients.

The transition from Pamilacan ECA to PSCC has seen the establishment of policies and processes in place, while also underscoring the need to solidify institutional coordination, and ownership across different actors. This is especially significant as they pursue collaborations to spur social upliftment in the long-term.

Current arrangements include BOHECO I in charge of consolidating billing for the island consumption, PSCC handling payment collection, while the barangay council provides monitoring support. The Barangay Captain and BOHECO I General Manager also serve as advisers to the PSCC board.

Collaborative ventures both within and beyond the community must be pursued to ensure a sustainable energy transition towards holistic sustainable development in Pamilacan.



## **CentRE members involved in featured RE projects:**

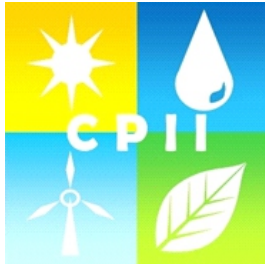


One Renewable Energy Enterprise, Inc. (OREEi) is a renewable energy systems integrator that delivers a triple bottom line impact. It provides clean energy for individual and commercial use, thus mitigating environmental damage. It provides products that directly impact the quality of life, health, and livelihood of the community in off-grid or under-electrified areas. Last but not least, it is a sustainable social enterprise that adopts a cross-subsidy model to contribute to the country's economic growth.

Its mission is to harness the power of renewable energy and uplift Filipino lives by delivering relevant solutions that will unlock unlimited opportunities.



The Center for Renewable Energy and Sustainable Technologies (CREST) is a non-government technical organization that advocates sustainable energy and climate action. It participates in energy policy advocacy, project development, and multi-sectoral engagements. (Email: [crestphilippines@gmail.com](mailto:crestphilippines@gmail.com))



The Center for Power Issues and Initiatives (CPII) is an initiative by a group of men and women committed to pursuing a power shift agenda in the Philippine power industry. It pushes for a reliable, affordable, and environmentally sustainable energy and a system of generating and distributing energy that empowers consumers and allows the poor to have electricity access. The CPII conducts research and policy studies on renewable energy and energy democracy and establishes stronger relations with trade unions and associations in the power industry, electric cooperatives, and the social housing sector.



WeGen Distributed Energy is a next generation energy business that uses rapidly advancing renewable energy, battery storage, and software technologies to develop energy solutions for a range of applications – from homes, schools and small businesses, to large industrial and commercial properties, resorts, and even entire islands. Its mission is to empower families and communities with clean, smart, affordable energy - anytime, anywhere. It is committed to eradicating energy poverty by providing clean and affordable energy anytime, anywhere, for everyone. Its key activities include project development for solar installations, WeGen-Laudato Si, and WeGen Islands.

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The Friedrich-Ebert-Stiftung (FES) is a private, not-for-profit, public interest cultural-educational foundation in Germany committed to the ideals and basic values of social democracy. Headquartered in Berlin, FES has been active in the Philippines since 1964. In its cooperation with civil society organizations, labor groups, the academe, and the government, it seeks to contribute in consolidating democratic institutions and in strengthening an inclusive political system and a people-centered economic development.



The Center for Empowerment, Innovation and Training on Renewable Energy (CentRE) is a not-for-profit association of RE advocates, developers, researchers, experts and social impact investors pursuing full deployment of RE in the country to address energy poverty, high electricity rates, and climate change in a just, sustainable and democratic manner.

With diverse expertise of its members – CSOs, private industry players, electric cooperatives, academic centers and individuals engaging on energy, climate, environment and good governance – the CentRE is envisaged as a hub for knowledge, social innovation, policy studies, advocacy and community empowerment towards achieving 100 percent renewable energy.

Its goals: RE-CLAIM – realize **RE** through **C**apacity building, **L**inkages, **A**dvocacy, **I**nnovation and **M**obilization.

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