



# RE

RENEWABLE ENERGY



## CONGRESS & EXHIBIT

DECEMBER 18, 2020 | 1-5 PM

Linked Events (Deep Dive Sessions)

December 11 | 1-4:00 PM

December 14 | 1-4:30 PM

For registration guidelines and updates, visit

<http://recongress2020.thecentre.ph>

# REBUILDING BETTER

STRENGTHENING THE ROLE OF RENEWABLE ENERGY  
IN RECOVERY & DEVELOPMENT





# 3<sup>rd</sup> Renewable Energy (RE) Congress

## 1<sup>st</sup> International Conference on Renewable Energy and Appropriate Technologies

DEEP DIVE SESSION  
Re-energizing the Marginalized:  
Inclusive Recovery with Renewable Energy

11 December 2020





# RE-ENERGIZING THE MARGINALIZED: INCLUSIVE RECOVERY WITH RENEWABLE ENERGY



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**SESSION 1:**  
**INCLUSIVE RECOVERY WITH RENEWABLE ENERGY**  
**CASE PRESENTATION ABSTRACTS**



# MODERATOR

## Mr. Francis dela Cruz



"Shifting to renewable energy now will allow us to redirect our development plans to one that is low-carbon, and one that simply makes economic sense. A low carbon energy path is what the Earth and the future generations deserve."

*Francis Joseph Dela Cruz is currently serving as the Engagement Officer of the Philippines Branch of the Climate Reality Project (TCRP). He's also the Partnerships and Advocacy Advisor of the Institute for Climate and Sustainable Cities (ICSC). Francis has been involved in campaigning for renewable energy and sustainable development in the last 3 decades. He was present during the founding of the CENTRE and in the RE Congresses.*





**Engr. Riedo Panaligan**

## **RE for forest protection - the Sierra Madre Mountain Range (SMMR) case**

Unlike conventional power plants, renewable energy systems such as solar PV, microhydro, and small-scale wind can be easily deployed, operated, and maintained by trained local residents. By enabling electrification using renewable energy, communities benefit from lighting during the night, helping extend their time for social and economic activities and increase the sense of safety among families, especially among women and children.

And for indigenous peoples (IPs) and upland communities of Sierra Madre Mountain Range (SSMR), the introduction of renewable energy also reiterated the clamor to protect the forest, watersheds, and ancestral domains.

Many Dumagat indigenous families live in subsistence. Despite their harsh living conditions, they continue to protect the forests and fight for their ancestral domain that are encroached upon by environmentally destructive projects. The provision of solar home systems address the basic energy needs of the families such as lighting at night.

Empowered by access to electricity, Dumagat leaders can now find it convenient to charge their mobile phones, allowing them to easily report any illegal logging activities to enforcers and support groups. During extreme weather events, Dumagat leaders also help provide crucial and timely updates about floods and landslides that are useful, especially to residents in low-lying areas.

Frontline members of the Bulacan Provincial Anti-Illegal Logging Task Force, composed of Dumagat leaders and volunteers, harness the energy from the sun to provide energy to an off-grid communication radio tower. The tower amplifies their radio signals, helping to transmit them to wider areas inside the Angat and Ipo Watersheds. This increased radio signal coverage proved helpful in entrapment operations that helped apprehend illegal loggers and poachers.

*Mr. Riedo Panaligan is president of the think-act institution Center for Renewable Energy and Sustainable Technology (CREST), and concurrently holds leadership positions in various regional and local climate networks. He is a licensed electronics engineer, and currently taking his Master (MSc) on Business Management, major in Green Energy and Climate Finance, at the Berlin School of Economics and Law.*



**Mr. Charlie Ayco**

## **RE for Sustainable Livelihood: The case of Aquaculture – SANACOR**

The Philippine aquaculture industry has grown a substantial 10% annually based on estimates during 2015. Mindanao is the leader in Philippine aquaculture, contributing 44% of the total national output in 2014. SANACOR, one of the biggest aquaculture companies in Mindanao, has high usage of electricity because of the aeration needs of their shrimp farms. Low oxygen levels can cause shrimp death which would affect the overall productivity of the aquaculture farm. Solar energy will now provide the energy needed to run the aerators and pumps with a large solar project to power the whole farm of SANACOR 2. The estimated power generation for the next 25 years is 22,061,853.99 kWh. This is one of the efforts the company makes to implement sustainable fishing and aquaculture practices. Compared to other forms of industrial meat production, aquaculture has been known to have a smaller carbon footprint. The utilization of these sustainable practices will help alleviate the effect of the country's food production industry on the ongoing climate crisis.

*Charlie Ayco was an Associate Professor of Theology at the Ateneo de Manila University after he left San Jose Major Seminary. When the Marcos regime was toppled, he joined politics and became Mayor of his hometown in Sevilla, Bohol, Philippines.*

*After his short stint in politics, he joined the NGO sector as the Executive Director of FCB Foundation. He was recruited by Habitat for Humanity Philippines as its COO then moved to Bangkok as the Director of Program Development and Support (Asia Pacific) of Habitat for Humanity International. He led the Habitat team to organize the first three sessions of the Asia Pacific Housing Forum held in Singapore (2007), Manila (2009) and Bangkok (2011). He returned to the Philippines in 2011 to become the CEO of Habitat for Humanity Philippines. He was also a member of the board of the Philippine Council for NGO Certification (PCNC) and became a resource person on housing issues in various consultative committees of the Philippine Congress.*

*Since July 2017, he joined WeGen Distributed Energy Philippines Holdings where he is currently the Vice President for Strategic Relations, a Director of WeGen Laudato Si and at the same time the President of WeGen Energy Bohol.*

*Charlie Ayco holds the following academic degrees: AB Philosophy Cum Laude (Immaculate Heart of Mary Seminary); MA Theology and Ph.D. (candidate) in Social Psychology (Ateneo de Manila University); Master in Development Management (with Distinction) from the Asian Institute of Management.*



**Mr. Erel Narida**

## **Solar-powered mills and irrigation for farmers**

Access to electricity is vital to progress. Electricity fuels local economic activity and uplifts the general well – being of the community. With the extended lockdowns due to the COVID pandemic, economic activity has slowed down and the effects of the lack of access to stable and 24/7 power have never been felt more intensely. Communities without reliable power have been isolated from the mainstream of development, commerce and information. In these short stories, we will feature three projects that have successfully utilized renewable energy to bridge the community's needs for access to sustainable livelihood, social services, education, information, and hope.

*Mr. Erel Narida is president / CEO of One Renewable Energy Enterprise, Inc. (OREEI) and president of Renewable Energy Association of the Philippines (REAP). Erel is a seasoned businessman with more than 35 years of experience in operations and supply chain. He has 17 years of experience in the renewable energy industry, starting his career as the Operations Manager of Shell Solar Philippines Corporation (SSPC) prior to founding OREEi.*

*Prior to SSPC, he held various positions in the supply chain division of Selecta Philippines, a subsidiary of the RFM Group. Under his leadership, the team-initiated innovations in supply chain operations that contributed to the spectacular growth of the business. He completed his Masters in Management and bachelor's degree at the University of the Philippines in the Visayas.*





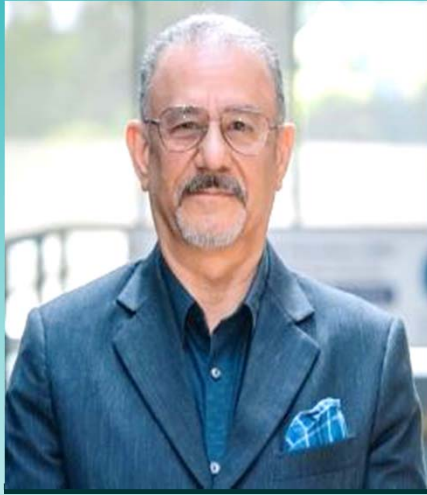
**Atty. Angela Consuelo Ibay**

## **Integrating RE in local energy planning**

This project is part of World Wildlife Fund-Philippines' Financing and Integrating Renewable Energy (FiNRE-BXU) project which aims to help Butuan City come up with its own energy plan. The project can help the Butuan City government decide what energy projects to prioritize and undertake based on a sound analysis of data. This led to more participation of Butuan LGU in energy issues especially now that there is a joint department circular between the DILG and DOE, which emphasizes the relevance of the LGU's role in energy planning and development. WWF-Philippines hopes to inspire more LGUs by following similar approach in their energy needs. Similarly, the organization has been training local stakeholders, integrating indigenous resources, and engaging financing institutions and energy developers to pursue clean, sustainable energy projects.

*Atty. Angela Consuelo Ibay is a lawyer with expertise in environment, renewable energy and climate change issues. After earning her law degree from the University of the Philippines College of Law, Atty. Ibay started out in the Environmental Management Bureau (EMB) at the Department of Environment and Natural Resources (DENR) where she focused on the conduct of research and studies on environmental laws for the formulation of guidelines necessary for possible implementation, with one of her focuses being climate change. Currently, she is the head of the Climate Change and Energy Program of the World Wide Fund for Nature (WWF) in the Philippines.*

**SESSION 2:  
iCREATE PAPER PRESENTATION  
ABSTRACTS**



## Professor Dr. Hussain H. Al-Kayiem

Head, Solar Thermal Advanced Research Center (STARC), Universiti Teknologi PETRONAS, 32610 Seri Iskandar, Malaysia.



## Goals and Achievements by STARC – Malaysia

Solar, as the main source of energy to earth, is the hope to close the gap of energy demand of the world and to mitigate the global warming and climate change. With no exemption, solar thermal technologies are experiencing the lack of continuous supply. Solar is not available during the night and cloudy days. In the solar thermal advanced research center (STARC)– Universiti Teknologi PETRONAS (UTP), researchers are trying to discover and develop solutions to mitigate the solar interruption problem. Among the research efforts are, the integration of solar thermal units with thermal energy storage, hybrid of solar thermal with other sources, development of efficient photothermic conversion and thermal fluids. The presentation in iCREATE meeting is highlighting the research directions and the achievements gained, so far, on the enhanced solar thermal technologies.

*Prof. Dr. Hussain H. Al-Kayiem completed his BSc in 1973, and MSc in Mechanical Engineering from University of Baghdad in 1981. After awarded PHD from University of Bradford-UK in 1989, he was appointed as head of the Mechanical Engineering Department in the Military College of Engineering – Baghdad for the period 1990-1997. From 1999 to 2003, he headed the Mech. Eng. Dept. in Al-Mustansiriya University, Baghdad. He operated as the manager of the Netherlands Engineering Consultants, NEDECO - Iraq branch 2003-2005. Prof Hussain has joint Universiti Teknologi PETRONAS (UTP) in Malaysia since 2006 till recent.*

*As a leader in Thermo-Fluids and Energy Technologies, he has published around 280 research papers, 5 books and many chapter in books. He supervised more than 75 PG, 65 graduated and 10 are ongoing. Also, he is inventor of 13 filled patents, 5 of them are fully granted.*

*Prof Hussain has been awarded in different national and international levels for his innovated achievements in the energy sector. He is awarded the Special Energy and Environment INNOVA2010 award – Brussels; and a special award from the Polish Inventor and Rationalize Institute, in 2011. And for his distinguished scientific contributions, he has been appointed as a research fellow of Wessex Institute of Technology-UK; research fellow of Center of Excellence for Advanced Research in Fluid Flow, CARIFF-UMP and a research fellow in the Power Generation Research Centre, PGRC - UNITEN. He is editor and editorial board member of three international journals and the editor of the Engineering journal – UTP platform. For his distinguished academic achievements, Prof. Hussain has been conferred the 'Eminent Scientist Award' of Wessex Institute – UK in 2016.*

*Recently, he is professor of the Mech. Eng. – UTP; head of solar thermal advanced research center (STARC) and he is heading the Green Tech Working Group in Malaysia Education and Research Network, (MYREN).*



## Lawrence A. Limjuco, PhD

Myongji University, South Korea /

Mindanao Renewable Energy Center  
(MREC), Ateneo de Davao University,  
Philippines

## Selective Recovery of [Energy] Critical Raw Materials from Secondary Sources

Materials security and materials criticality have been a growing international interest leading to initiatives and number of studies to raw material supply. Energy critical raw materials (E-CRM) or energy critical element (ECE) are a class of chemical elements that currently appear critical to one or more new, energy-related technologies. Generally, “criticality” of CRM is mainly due to their low substitutability, rising demand, and restricted reserve distribution (geopolitical risk) while that of ECE is due to its limited extraction, trade, and utilization and are, therefore, not the focus of well-established and relatively stable markets. Due to limited supply of these elemental CRMs to most of the countries, prospecting it from other sources (i.e., secondary sources) is deemed very important. In this presentation, background of E-CRMs which includes its sources and technologies for its extraction is presented. Lastly, technological advancements as well as research opportunities for its selective recovery from secondary sources are highlighted.

*Dr. Lawrence A. Limjuco obtained his MSc/PhD Energy Science and Technology from the Myongji University, South Korea. He was recently awarded by the Government of the Republic of Korea (ROK) and the ASEAN with the ASEAN-ROK Award for Excellence in Science, Technology, and Innovation 2020 for his works in materials science for energy and environmental remediation application. Currently, he serves as the Senior Science Research Specialist of the Mindanao Renewable Energy Center (MREC) where he leads the conduct of the resource assessment activities especially for the MREC's concentrated solar power (CSP) project.*





## Isidro Antonio V. Marfori III

Mechanical Engineering Department  
De La Salle University, Philippines  
[Isidro.marfori@dlsu.edu.ph](mailto:Isidro.marfori@dlsu.edu.ph)

## Micro Hydro Technology and the Role of Academic Institution for its Development in the Philippines

The topic talks about micro-hydro power (MHP) system and its application to rural communities. Problems associated with rural communities' inaccessibility are discussed, followed by fundamental concepts of MHP system. MHP is a renewable source of energy and is commonly utilized for remote communities for electricity generation. Micro hydro power can also be grid tied system supplying energy to a distribution utility. In this topic, several research and university-lead projects related to MHP are presented. The first few sections describe research in the design of the MHP turbines. Experimental investigation as well as application of computational fluid dynamics analysis applied to MHP turbine such as axial and cross flow turbines are presented as an alternative approach to the design and optimization. The topic also touches on the MHP as a system in which all components of the MHP are considered. In this section, sustainability is the focus. Several research touches upon financial sustainability while others focus on MHP hybrid systems. Financial sustainability relies on the financial and other benefits brought about the MHP plant during its development and operation. Hybrid systems are those MHP with other energy sources such as solar and natural gas and with varying end user application. Systems approach will also show current studies involving MHP site-specific characteristics and how this affects sustainability in terms of unit cost. Finally, future studies and the trends in MHP in the context of the academic institutions and how it will affect the development of MHP in the Philippines are presented.

*Isidro Marfori III or what his friends and family call him "ingko" is a faculty at De La Salle University, Philippines. He has finished his master's in mechanical engineering at De La Salle University and has been awarded most outstanding thesis from his work: Design and Optimization of a Propeller Type Micro Hydro Turbine using Computational Fluid Dynamics. Ingko has been involve in the field of micro hydro power (MHP) since 2004 and has contributed in local MHP standards, deployment of MHP plant and research in MHP turbines and controllers. He received the Pilar of Excellence Award in Community Engagement in 2015; one of the most prestigious awards given to a faculty at De La Salle University because of his work in MHP. Different from most engineers, "Isidro" loves the hands-on experience not just in engineering, but in all aspects of life. He has thought himself and became skilled to operate various machines such as the lathe, mill, and welding. He is also an expert in advanced computer aided design and simulation. Because of this, he has able to develop not just MHP turbines but also other products through the eyes of the designer, manufacturer, sales person and end-user.*



## Exploring the Potential of Additive Manufacturing for Renewable Energy Applications

As the entire energy industry shifts to more renewable and sustainable power sources due to global climate issues, the biggest challenge has been on keeping up with the demand for cost-effective manufacturing and robust research and development. This presentation provides an overview of how additive manufacturing or 3-D printing can be utilized for various renewable energy applications. In particular, this presentation explores the opportunity for additive manufacturing to innovate the wind and solar industries in terms of manufacturability and research. The encompassing promise of additive manufacturing is to strengthen the research and development of the renewable energy field using different research-driven 3-D printing technologies that for years have grown to be more mature, powerful, and versatile in producing prototypes and geometrically challenging designs that traditional manufacturing cannot offer. Drawing from this advantage, additive manufacturing becomes the catalyst for stimulating renewable energy innovations.

### Engr. Alejandro Espera, Jr.

Departments of Engineering Education, Data Analytics and Applied Statistics, Colleges of Engineering and Science - Virginia Polytechnic Institute and State University

*Andrew is a PhD candidate and a Graduate Assistant in the Department of Engineering Education at Virginia Tech (Blacksburg, Virginia) and is concurrently earning a master's degree in Data Analytics and Applied Statistics at the same institution. He is also a licensed electronics engineer and an assistant professor with the Electronics Engineering Department at Ateneo de Davao University. He earned his BS and MS degrees in Electronics Engineering from Ateneo de Davao University and Ateneo de Manila University, respectively. He was a DOST-PCIEERD research scholar sent to the Department of Macromolecular Science and Engineering at Case Western Reserve University (Cleveland, Ohio) to be trained for additive manufacturing research. He has done and published research in the areas of additive manufacturing (3-D printing) for electronics, the design of smart electronic systems, and instructional innovations for electrical engineering education. His current research interests include the instructional designs for teaching electrical and electronics engineering concepts, and curricular innovations for additive and advanced manufacturing programs.*