San Antonio Hybrid Renewable Energy Pilot Project

1st October 2019

OCEANTERA energy corporation

Introduction to Oceantera

- Joint venture between Singapore and Philippine-based **OceanPixel** and UK-based **Aquatera**
- Renewable energy development and sustainable solutions company based in South East Asia
- Team based in Singapore, Manila and UK with network of global partners and associates
- Expertise in utilisation and commercialisation of ocean renewable energy resources
- Specialise in the application of hybrid energy systems and other emerging technologies in island and coastal communities

Mission Statement

"To be a leading provider of sustainable solutions, including clean, affordable and reliable energy to remote and island communities through responsible development in collaboration with our partners and empowered local communities."

Oceantera activities – 2019

- Renewable energy demonstration sites and pathfinder projects
- Off-grid island and coastal community energy systems
- Grid connected utility scale renewable energy projects
- Electrification of ecotourism and fishing vessels
- Community outreach and education

San Antonio - project overview

- Integrated renewable energy power generation system to service the Municipality of San Antonio in Northern Samar
- Designed to phase out the existing diesel gen-set system
- Clean, reliable and affordable electricity and other essential services for over 9000 local residents and local businesses

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Project objectives

- **Increased energy security** – improved access and reliability to affordable power from local supply

- **Increased food security** – ability to store food (particularly caught fish) for use during poor and extreme weather

- **Disaster resilience** – tidal energy resource little affected by weather and climate, technology designed to withstand extreme weather conditions

- **Climate change adaptation** – reduction in reliance on diesel protects community from future price increases

Existing energy system

Factor	Note(s)
Existing system	963kW diesel gen-set system
Power Producer	NPC-SPUG (Missionary electrification)
Distribution Utility	NORSAMELCO
Contracted energy 2019 to 2023	~1500MWh, 24 hours supply
Diesel Consumption	~32,100 liters per month
Diesel price	$0.86 per liter
Household electrification	~80% (2019)
Approved True Cost of Generation (TCGR)	$0.48 USD/kWh
Subsidised Approved General Rate (SAGR)	$0.11 USD/kWh
Renewable Energy Generation	Mandated by law "Renewable Portfolio Standards for Off-grid areas"

Proposed energy solution

- Combined tidal current and onshore solar energy along with battery storage
- Integrated with existing energy infrastructure
- System will deliver electricity 24 hours per day at a **lower rate than the 'true cost of generation'**
- System can **reduce current government subsidies** required to support energy provision on the island

Project development partners

POSEIDON
RENEWABLE ENERGY CORPORATION

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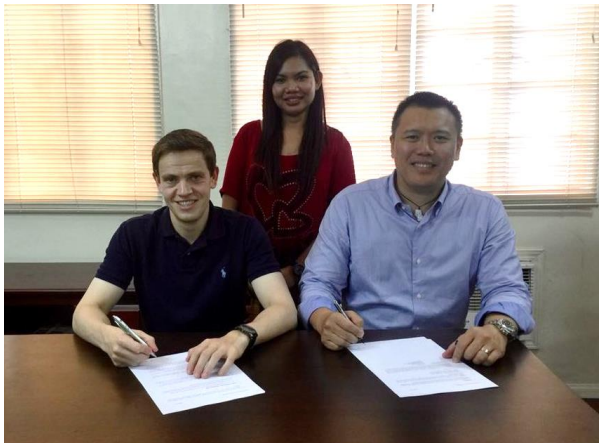

NORTHERN SAMAR ELECTRIC COOPERATIVE INC. • 1977 •

NORTHERN SAMAR ELECTRIC COOPERATIVE, INC.
(NORSAMELCO)

Project beneficiaries

- **Local residents:** improved access to energy and stored food as well as greater disaster resilience for approximately 9550 residents
- **Women:** empowerment of women (estimated 50% of the population) through skills development, training and livelihood development
- **Children:** through access to healthcare, information and education (children (below 14 years old) are estimated at 33% of the population)
- **Local businesses:** opportunities to improve services and expand businesses. In more secure and reliable energy making sectors e.g. tourism, food processes, communication and data services
- **Local utility:** Northern Samar Electric Cooperative will benefit from reliable and affordable power, helping meet targets for RE generation and increase revenue
- **Local government:** support for programmes on sustainable development, disaster preparedness, climate change mitigation etc
- **National government**: the project will deliver a test case or model for sustainable island electrification that can be rolled out across the country

Alignment with UN SDGs

Current status and next steps

Current status

- Resource identified and Service Contract approved
- Potential off-taker and route to market identified
- Project deemed to be technically and commercially viable
- Site visits and consultations with key stakeholders
- Engagement with all regulatory bodies

Next steps

- Detailed design and financial modelling
- Permitting
- Working with DU and key stakeholders to identify the best route to PPA
- Project financing
- Procurement
- Construction and implementation

Lessons learned (so far….)

- **Technology** – stakeholders are often not familiar with ocean energy generation technology and view it as a ‘high risk’ option – education and outreach is required to facilitate development
- **Cost** – first projects are high cost but also high impact in terms of sustainable development, social enhancement and economic growth – this needs to be communicated to funders and regulators
- **Regulatory** – many countries and communities do not have the regulatory processes and resources in place to manage the development of these innovative projects – early engagement is key

Lessons learned (so far….)

- **Infrastructure** – new or improved infrastructure will be required to deliver these projects – the social and economic impacts of these improvements can bring direct added benefits to local residents and businesses
- **Supply chain** – there is unlikely to be a ready supply chain – this provides an opportunity to deliver local training and capacity building programmes, creating a long term supply chain and workforce for the project, whilst creating jobs and opportunities within the community

Thank you.

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