Accelerating the development of Offshore Renewables and Ocean Technologies in SIDS

Webinar II - Ocean Thermal Energy Conversion (OTEC)

Friday 11 February 2022, 00:00 GST -02:00 GST

Summary

On Friday 11 February 2022, the International Renewable Energy Agency (IRENA) through the SIDS Lighthouses Initiative hosted a webinar that focused on ***Ocean Thermal Energy Conversion (OTEC)***. The event, which was attended by 92 participants is the second segment in the Technical Webinar Series ***"Accelerating the development of Offshore Renewables/Ocean Technologies in Small Island Developing States (SIDS)***" which aims to promote offshore renewable energy development in the small island states, including ocean energy through the sharing of global, regional and national experiences, best practices and lessons learned on offshore energy technologies.

In the **opening session,** Mr. Francesco La Camera, Director General, IRENA, highlighted that SIDS need support from the international community to achieve their NDC targets. He emphasized that OTEC is a promising technology in SIDS and can play a key role in the energy transition. OTEC simultaneously benefits complementary systems and activities such as cooling, desalination and agriculture to boost the overall blue economy in SIDS. He emphasized the role of IRENA through the SIDS Lighthouses Initiative (SIDS LHI) in collaborating with partners to help in project facilitation, financing and technical assistance. SIDS LHI has launched two reports that highlighted the role of offshore renewable energy and blue economy in SIDS. Mr. Francesco La Camera expressed gratitude towards the AOSIS chair for encouraging ocean energy development in SIDS and underlined the merits of the support to SIDS through the continued IRENA-AOSIS collaboration.

H.E. Dr. Aubrey Webson, Chair, Alliance of Small Island States (AOSIS) in delivering the **keynote address** stressed that this webinar series is a timely initiative as SIDS are trying to recover from the economic losses caused due to the Covid 19 pandemic. The high dependency of SIDS on imported fossil fuels and the varying prices and availabilities of these fuels, poses further risks to recovery efforts. He emphasized that accessible means of implementation including various financial instruments and international collaborations, need to be mobilised with the help of sustainable partnerships such as the long-standing IRENA-AOSIS partnership (MOU COP26) to advance the development of renewable energy in SIDS. SIDS can capitalize on the vast ocean energy resources available to them and learn from each other to scale up the best practices. Currently, electricity generation from wave energy contributes to the base load in SIDS like Barbados, St Lucia, Tonga, Trinidad and Tobago and Cape Verde, and Sao Tome and Principe have announced the implementation of their 1st commercial OTEC plant community.

In the **scene setting presentation,** Mr. Amjad Abdulla, Head of Partnerships, IRENA, gave an overview of the SIDS Lighthouses Initiative (SIDS LHI) and the different energy transition tools and services, project facilitation and technical assistance IRENA offers to SIDS through this initiative. He highlighted the resource potential of OTEC in SIDS and the important role OTEC can play in economic growth of the offshore industry sector.

During the **Case examples: Applications and Benefits of OTEC** presentation, Prof. Yasuyuki Ikegami Director, Institute of Ocean Energy, Saga University, Japan, provided a technical overview and case examples on the applications and benefits of OTEC based on the Kumejima Model in Japan and the Hybrid OTEC plant in Malaysia. These models enable resilient economic development by increasing the energy, water, food and economic security of the region. A technical pre-feasibility study is being conducted in Nauru with the support from the United Nations Industrial Development Organization (UNIDO), Climate Technology Centre & Network, the Government of Japan and the Institute of Ocean Energy at Saga University.

In **perspectives from SIDS** session, Mr. Tutii Chilton, Executive Director, **Palau** Energy Administration, Ministry of Public Infrastructure, Industries and Commerce, expressed Palau's interest in OTEC to achieve SDG 2, SDG 3 and SDG 7 targets. Palau is concerned about the high investment costs required for implementing OTEC. Currently Palau's NDC has a target of achieving 25% renewable in their energy mix by 2025. Palau envisages that the electricity generated from OTEC will be utilized for green hydrogen production.

Mr. Carmine Piantedosi, Chief Executive Officer, Nauru Utilities Corporation, **Nauru**, spoke about the pilot OTEC project constructed in Nauru in 1981. The plant operated for a short time before suffering environmental damages. Nauru has a target of integrating 50% renewables in its energy mix by 2022, primarily through solar and wind technologies. Nauru is undertaking feasibility studies on implementing OTEC to help achieve an ambitious target of 100% renewables in the future.

Mr. Gilles Deal, Energy Analyst, Ministry of the Environment and Housing, **the Bahamas** highlighted the lessons learned from the two pilot OTEC plants commissioned in the Bahamas in 2011. These projects did not pass environmental parameters and were shelved. The projects required further studies and analysis on the environmental impacts of the intrusion into the seabed and the integration with the main undersea communications cable to ensure limiting the adverse effects on the beaches such as increased erosion. The pilot plants were to be used for air conditioning and desalination applications

Ms. Sherry Waithe, Project Officer, Division of Energy, Ministry of Energy and Business Development, **Barbados,** provided a detailed overview on the various feasibility analysis conducted to explore the benefits of OTEC in Barbados since 2013. An ocean energy study conducted between 2019 and 2021, analysed the electricity sector, policy framework, benefits to dependent sectors as well as cost estimations for OTEC plants sized at 1MW, 10MW and 20MW. Landing sites, identification of suitable distance of the plant from shore, high up-front cost, high risks, low commercial availability were the challenges identified. Barbados has not considered OTEC as a priority in its RE roadmap until 2030.

Mr. Simona Kilei, Director, Department of Energy, Ministry of Transport, Energy & Tourism, **Tuvalu**, expressed Tuvalu's plans of conducting feasibility studies to analyse the potential of OTEC and their interest in reaching out to Nauru for the lessons learnt from their OTEC project. He highlighted the importance of availability of funds, maturity of the technology and environmental risks associated with the technology.

Mr. Mikaele Belena, Director of Energy, Department of Energy, Ministry for Infrastructure, Transport, Disaster Management and Meteorological services, **Fiji,** highlighted that Fiji has a target of achieving 100%

renewable in its energy mix by 2030 with hydropower being the major technology. OTEC will be considered in the medium- and long-term planning. Fiji has collaborated with local institutions on the feasibility of OTEC. Fiji requested support from IRENA to explore the technology and its complementary systems such as a desalination facility.

In the session on **financing OTEC** projects, Mr. Tarig Ahmed, Programme Officer, Technical Advisory Services, IRENA, provided a detailed overview of two of IRENA project facilitation and financing platforms. The Climate Investment Platform (CIP) has four key features: enhance climate targets, policy regulations, marketplace and financial de-risking. The platform receives applications and facilitates matchmaking with partners. The platform has more than 300 partners with over 70 financial partners. CIP also offers technical assistance for project documentation.

Energy Transition Accelerator Financing (ETAF) platform was launched in 2021 and is a multi-stakeholder platform providing innovative climate financing solutions to advance energy transition, implementation of NDCs and the realization of SDGs across IRENA's membership countries. The platform helps developers access funding and also offers co-financing and co-investment opportunities. UAE via the Abu Dhabi Fund for Development (ADFD) has provided an anchor funding of USD 400 million.

Mr. Roman Doubrava, Head of Innovation Fund Unit European Climate, Infrastructure and Environment Executive Agency, European Commission, highlighted some key features of the Innovation Fund launched in 2021. However, only EU states and island territories can apply to avail the fund. The Innovation Fund size is more than 25 billion EUR and supports large scale projects with capital expenditures above 7.5 million EUR as well as small scale projects below this threshold. The key objective of the fund is to share the risks with project promoters, scale up green technologies and make them commercially competitive. The Martinique OTEC project funded through NER300 was of 72 million EUR. The project failed to become operational in 2020 due to major technical challenges. The technology and financial analysis of such high capital, high risk projects need to be improved for OTEC projects to be funded through such schemes. The next call for the Innovation Fund in Q3 2022 and Q4 2022 for small- and large-scale projects respectively.

In the **concluding remarks,** Ms. Arieta Gonelevu Rakai, Programme Officer, SIDS Lighthouses, IRENA, summarised the key takeaways of the webinar as below:

- OTEC as a technology is promising in helping SIDS achieve their NDC targets. By products of OTEC such as desalination plants, aquaculture, irrigation etc. provide economic benefits beyond renewable electricity production.
- Economic development in the energy-food-water nexus because of OTEC, will help ensure the bankability of these projects and encourage investments in the implementation of the technology.
- Owing to high costs of implementing OTEC, SIDS must work with partners to find avenues to reduce costs by increasing public and private sector investments as well as public private partnerships to accelerate the scaling up and commercialisation of the technology.