Accelerating Offshore Wind and Floating Solar PV Technologies in SIDS
Webinar I - Offshore Wind and Floating Solar Photovoltaic (PV)

Thursday 16 December 2021, 17:00 GST -18:30 GST

Summary

On Thursday 16 December, 2021, The International Renewable Energy Agency (IRENA) through the SIDS Lighthouses Initiative hosted a webinar focused on ***Offshore Wind and Floating Solar Photovoltaics (PV).*** The event, which was attended by 147 participants is the first segment in the Technical Webinar Series ***"Accelerating the development of Offshore Renewables/Ocean Technologies in Small Island Developing States***" which aims to promote offshore renewable energy development in SIDS, 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**, Ms. Gauri Singh, Deputy Director General and Mr. Courtenay Rattray, UN Under-Secretary General and High Representative, United Nations Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (UN-OHRLLS) highlighted the importance of ocean energy research and development that will lead to future uptake in SIDS. They stressed the need for innovative and tailor made technologies and financing solutions that meet the needs and challenges of the local conditions. Additionally, public and private partnerships and international collaborations were encouraged to realize the significant potential of offshore wind and solar PV technologies in the energy system of SIDS. In this regard, Mr. Rattray urged participants to register interest for the 2022 SIDS Global Business Network hosted by the UN- OHRLLS to promote partnerships with the private sector for achieving SDG 14.

The **technical presentations** highlighted the following key points:

- **Offshore wind** technology is regarded as a major solution to reduce carbon emissions and local pollution. Advancement of this sector will promote economic development, energy security, job creation and save 78 trillion litres of water annually water which would otherwise be used for energy production from fossil fuels.
- The increased interest in offshore wind technology, has promoted investments and involvement of many international institutions, governments and large oil and gas companies. New offshore wind capacity installations are projected to increase from 6 GW in 2020 to 40 GW in 2030 globally, with significant untapped potential in the Oceania and

SIDS. The Caribbean has been identified as the front runner for offshore wind potential. An IDB-CDB study of 9 Caribbean SIDS countries revealed an estimated technically exploitable resource of 138GW. Opportunity also exists in Fiji, Papua New Guinea, Vanuatu and Mauritius.

- Globally, the capital expenditure is expected to be USD 500 billion until 2030 and an additional USD 3 trillion by 2050. Notably, the scale and uptake of wind farms and turbines are driving cost reductions in this sector. Further costs reductions in the floating foundation wind turbines technology driven by high income economies will benefit SIDS.
- **For Floating offshore wind**, countries such as UK, Japan and South Korea are testing this technology at the prototype and pilot level. It was noted that several floating solutions can be rapidly scaled up and commercialised. In the context of SIDS, floating offshore turbines provide flexibility for modular scale up of individual turbines that can be integrated with the grid. Challenges such as lower total power demand as compared to larger economies, lack of large industrial manufacturing capacity, climate change and unpredictability of the weather can be addressed by adopting modular floating offshore wind turbines.
- Using Scotland as a case example, factors that should be considered while deploying an offshore wind project include: marine spatial planning for site selection, baseline data collection and management, foundation technology and turbine size, supply chain strategy, space and quayside requirements especially for floating foundations, distance to the port, grid connection (remote areas typical to SIDS face grid connection challenges), clear ownership between the stakeholders and regulatory processes. It was noted that Government subsidies also help to drive cost reductions. Separate subsidies for floating and fixed projects allows for floating wind projects to develop without competing with the fixed wind technology already commercialised in the market.
- **For floating Solar PV**, the case example from Sembcorp Industries, demonstrated how Singapore has sought to use floating solar PV to optimise land use while offering higher performance as compared to rooftop solar PV. The floating solar PV project in Singapore extend over 45 hectares with an installed capacity of 60 MWp offsetting 32 kilotonne of CO2 emissions annually. Singapore aims to achieve 2 GWp of solar capacity by 2030 contributing to 3% of the total electricity demand of the country.
- Key challenges such as anchoring and mooring designs, good cable management, operation and maintenance (O&M) and environmental impacts need to be considered critically for the floating solar PV projects to be successful. Furthermore, important factors that need to be considered in the development of a floating solar PV project include but are not limited to: access and right to the water body, nature of the consumption of the energy produced, involvement of key stakeholders and impacts on biodiversity.

- While SIDS have some of the highest and promising potential for these technologies owing to their unique geographical configuration, they continue to face limitations to their development such as: under-developed regulatory frameworks for emerging technologies; robust financial models for de-risking the high-risk investments and small availability of space resulting in smaller scale projects as compared to the scale of offshore projects in developed economies and grid integration. To address this policy and energy sector planning and project preparation for financial credibility is important. Additionally, philanthropists can extend financial support through grants to de-risk the investments.
- Perceived challenges for SIDS in deploying offshore wind projects include difficulties in attracting developer, suppliers and services for comparatively small-scale projects, environmental and social impacts, capabilities of local government agencies for tendering the projects, grid connections, financial stability and credit worthiness of off takers and guarantees.
- In general, for SIDS, engineering assessments are key to identify the scope of feasibility of ocean resources for energy production. Additionally, extreme weather conditions and the integration of large-scale wind farms with small scale regional and national grid capacities need to be assessed critically.
- In the case of Tuvalu, offshore technologies are being considered to achieve their targets of 100% renewable electricity production by 2025 and 60% reduction in energy demand from 2010 levels by 2025. Offshore fixed and floating solar PV in Nukufetau island and Tafua pond respectively are in the pilot stage. Research has been conducted on the potential of onshore wind, but further research and funding is required for offshore wind and solar PV installations.

Representatives from financial institutions and organisations shared their work in advancing offshore wind and floating solar PV as follows:

- The Caribbean Climate-Smart Accelerator (CCSA) has established a financial Advisory Committee consisting of regional leaders, financial institutions and representatives from the Caribbean Development Bank (CDB) which studies projects ready for investment and projects that need de-risking strategies. Furthermore, CCSA is seeking investments in proven technologies that can be tested at scale within a controlled region such as in SIDS before mass adoption at a global level. The Accelerator has also partnered with the World Intellectual Property Organisation to help train entrepreneurs and highlight blue economy opportunities.
- The World Bank Group Offshore Wind Development Programme was launched to accelerate the adoption of offshore wind in emerging markets through knowledge and experience exchange and technical assistance. The World Bank supports market development and scoping of the project as well as financial support in the form of grants and guarantees from the World Bank, private sector lending from IFC and involvement

of other commercial banks and institutions. Noteworthy, is the support being provided to the Maldives in installing near-shore floating solar PV through the Accelerating Renewable Energy Integration and Sustainable Energy (ARISE) project.

- Similarly, the CDB is focusing on information sharing to reduce the risk for developers and countries and to help them identify areas of investments. They are also supporting the public sector in identifying investments in transmission and distribution and utility planning.