Abstract

SESSION 3:

From Vision to Reality: Aligning the Global Agenda with Local Benefits

WORKSHOP 3.3:

Blue Economy Development: Where are we now? Where are we headed?

Outlook for Ocean Energy Development in Korea

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From 2000, Korean government (the Ministry of Oceans and Fisheries (MOF) and the Ministry of Trade, Industry and Energy (MOTIE)) has operated the national R&D program for the development of ocean renewable energy technologies on tidal power (barrage), tidal current energy, wave energy and ocean thermal energy conversion (OTEC). Based on the R&D results, Uldolmok Tidal Current Power Pilot Plant (1MW), Sihwa Tidal Power Plant (254MW) and hybrid-OTEC power plant using multiple heat sources (200kW) had been built in 2009, 2011 and 2014, respectively. And Jeju Wave Power Pilot Plant will be completed in 2015.

Ocean energy has considerable long-term potential for economic growth, energy security and job creation. In order to develop ocean energy, a critical technology and successful cases of practical applications should be provided and proven. Generally ocean energy technologies have reached the stage of demonstration, and verification of machine performance, and pre-commercialization. In this presentation, the state of the art for ocean energy technologies and recent technical trend are briefly introduced, and Korea's experiences on the development of ocean energy technologies are also included. Europe has a plan to build the pilot arrays for tidal current and wave power consisting of several devices with the installed capacity of about 10MW for technology development, reducing cost, risk-sharing through a "learn by doing" approach, which will be expected to provide the cornerstones of a successful market deployment strategy.

The MOF of Korea has established the mid- and long-term strategic roadmap of RD&D&B to support early commercialization of ocean energy in Korea. In this program, the development of the field test centers for tidal current energy and wave energy will be started in 2017 for the examination and performance verification of technologies. The construction of the first pilot arrays of tidal current energy of installed capacity of about 10MW will be commenced in 2020 after the feasibility study and environmental impact assessment, which could be a good opportunity to the related industry and forming a supply chain.

Ocean energy resources, environmental and economic conditions are different from country to country including national policies. For the successful industrialization of ocean energy, some barriers should be overcome, such as financial risk, technological uncertainties, marine environmental impacts and grid-connection problems, etc. For the economically feasible and environmentally sound development of ocean energy, the exchange of technology and knowledge is recommended, especially for the assessment and mitigation of environmental impact, risk-sharing business model and set-up of supply chain.

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Dr. Lee graduated from Seoul National University, Korea with a degree in Civil Engineering. He obtained a Diploma in coastal hydraulics from the International Institute for Hydraulic and Environmental Engineering, Delft, The Netherlands, and Ph.D. in coastal engineering from the Department of Civil Engineering, University of Liverpool, U.K.