

Abstract: Covering more than 70% of the Earth's surface, seas and oceans are fundamental drivers for the world economy, with high potential for innovation and growth. In particular, they represent a huge source of renewable energy, primarily in the form of offshore wind, whose exploitation experienced an exponential increase in the last years. Other ocean renewables, such as wave and tidal energy, although characterized by lower technological maturity, could strategically contribute to the diversification of the energy portfolio. This speech will provide an overview of the main offshore generation technologies, as well as ocean consumption centers. Moreover, the design and operation of the offshore electric grid required for their interconnection will be covered. Specifically, the challenges of integrating offshore transmission and distribution grids, characterized by HVDC technology and high penetration of power electronics, into the traditional onshore power system will be addressed. The status and perspective for the development on a highly-interconnected Offshore Grid in the North Sea will be also presented.