The expansion of offshore wind energy will lead to increasing conflict with other human uses of the ocean, such as fishing, and the socio-ecological effects of such expansion are uncertain. The broad-scale development of offshore renewable energy is likely to affect many components of the marine ecosystem directly, cause indirect changes to ecosystem processes, structure, and function, affect fish and wildlife species that inhabit these ecosystems, and affect the provision of ecosystem services that benefit humans both directly and indirectly. In this seminar I will outline the compelling need to understand these impacts to help the global community make ecosystem-based management decisions around the shift to renewable energy sources. These decisions will be grounded in economics and politics, whether or not marine sciences are represented. There are enormous benefits to be gained from renewable energy development. There are likely to be costs as well. The challenge for marine scientists is to rapidly scale up the development of scientific evidence, as well as translate that evidence into effective information in support of multi-sectoral ecosystem-based management in the ocean.