

Renewable Ocean Energy

Renewable energy is energy from sources that are constantly renewed by natural processes.¹ The most relevant renewable energy sources to PNCIMA are wind power, water (hydroelectric) power, and ocean power from tidal and wave energy. Wind power potential is presented in the accompanying map.

Wind energy can be harnessed by turbines and converted into electricity. Marine wind resources are generally best along coastlines and on large, open areas of ocean, where winds are stronger and less turbulent. Offshore wind projects also require close proximity to the power grid, shallow water and a suitable substrate on the sea floor.²

Marine wind resources are best along coastlines and on large, open areas of ocean

Data Sources and Methodology

Wind power resources presented in the accompanying map are from the Canadian Wind Energy Atlas (CWEA) produced by Environment Canada. In the CWEA, 65 partially overlapping tiles illustrate Canada's wind potential. Two tiles cover the entire PNCIMA region. On each tile, climate is characterized by a large set of weather conditions, providing more than 200 different possible atmospheric states. Through climate modeling, wind flow was spatially determined for each of those states. Results were further processed with a statistical model representing the dominant winds in order to obtain weighted average wind velocities. Further statistical modeling was applied using large scale long term atmospheric data to obtain a small scale picture of atmospheric motion. A detailed description of the methodology used can be found at the CWEA website.³

Data displayed on the map represent mean wind power in watts per square metre at a height of 50 m above the sea surface. The data represent potential resources, not economically realizable resources. No consideration has been given to the following factors: environmental impacts, technological developments and limitations in power extraction, global climate change, site location versus power grid accessibility and power demand, water depth, suitable bed substrate, the effect of potential energy extraction schemes on existing wind regimes, and economic factors.⁴

Wind Power in PNCIMA

The highest mean wind power in PNCIMA is shown in dark red on the accompanying map. Large areas of high mean wind power at 50m above sea level include: northwest of Vancouver Island in the vicinity of Scott Islands, Central Coast area west of Goose Island, and northern Hecate Strait.

Material presented is drawn from the following literature reviews, which include primary references:
 1 Government of BC. 2007. The BC energy plan. Ministry of Energy, Victoria, 44pp.
 2 MacConnachie, S., Hillier, J. and Butterfield, S. 2007. Marine use analysis for the Pacific North Coast Integrated Management Area. Can. Tech. Rep. Fish. Aquat.Sci 2677: viii + 188 p.
 3 Environment Canada. 2008. Canadian Wind Energy Atlas. <http://www.windatlas.ca/en/methodology.php> (Accessed March 2011).
 4 Cornett, A. 2006. Inventory of Canada's marine renewable energy resources. Canadian Hydraulics Centre, National Research Council. CHC-TR-041. 156 pp. http://chc.nrc-cnrc.gc.ca/Coastal/Projects/proj-6_e.html (Accessed October 2010)



Offshore wind farm (UK). Photo: Eleanor Partridge/Marine Photobank

