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What is Wave Power?

- Wave energy is the term used for the energy generated from the power found in waves.
- Differential heating of the ocean surface from the sun creates wind, which creates waves and swells.
- The energy that is available in a wave depends on its length and height.
- The waves and swells that arrive near shore have collected energy from broad areas of the ocean.

WHY WAVE?

- The west coast of BC has been identified as having some of the best wave energy potential in the world.
- Future projects may be constructed along the west coasts of Vancouver Island, and Haida Gwaii.
- Wave energy is highly forecastable and, since it collects wind energy over large areas, is relatively persistent.
- Wave energy is most intense in winter months when BC energy needs are highest.

THE TECHNOLOGY

- Wave energy devices are designed to capture the energy found near the surface of the water and convert it to power.
- The energy harvesting devices exploit the changing water surface from wave trough to crest and the dynamics of water movements in the wave.
- Wave energy plants will be, for the most part, arrays of generators interconnected to the grid.
- While numerous configurations of wave energy devices have been invented and tested, there are commonly five categories:
 - Buoys
 - Surface following
 - Oscillating water column
 - Terminators
 - Overtopping
- BUOYS – floating structures which are carried up and down and/or pushed side to side by the waves and convert that movement into power to drive a generator.
- SURFACE FOLLOWING – floating structures hinged together following the surface movement of passing waves using the relative motion of the parts to drive a generator.
- OSCILLATING WATER COLUMN – enclosed column of air which rises and falls with the motion of the waves, pushing out and sucking back through a turbine which drives a generator.
- TERMINATORS – line of floating structures placed facing the oncoming waves and forced to move against each other using the power to drive a generator.
- OVERTOPPING – an offshore reservoir is created as waves flow up a ramp into the structure, then flow back out through a turbine that drives a generator.



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Our mandate is to develop a viable independent power industry in BC that serves the public interest by providing cost-effective electricity through the efficient & environmentally responsible development of the province's energy resources.

KEY LINKS

The Ocean Renewable Energy Group (OREG)

www.marinerenewables.ca

The European Union Ocean Energy Association (EU OEA)

www.oceanenergy-europe.eu

RenewableUK

www.renewableuk.com

The Ocean Renewable Energy Coalition (OREC)

www.facebook.com/OceanRenewableEnergyCoalition

Aotearoa Wave and Tidal Energy Association (AWATEA)

www.awatea.org.nz

Oregon Wave Energy Trust (OWET)

oregonwave.org

NRCan CanmetENERGY Marine Energy

www.nrcan.gc.ca/energy/offices-labs/canmet/

WAVE POWER IN BC

- Two wave energy projects have received provincial ICE funding: SyncWave Energy Systems and the Pacific Coastal Wave Energy Corp.
- Both projects are located off the west coast of Vancouver Island.
- The West Coast Wave Collaboration Project is a government and industry resource assessment initiative that will develop modeling expertise, advance the development of wave energy projects in BC, and provide critical information to wave energy device developers.
- Several potential wave farm development sites have been investigated.

ENVIRONMENTAL & REGULATORY CONSIDERATIONS

- There are no known environmental issues for wave energy.
- Strategic Environmental Assessments and Environmental Impact Assessments have been completed in a number of jurisdictions.
- While concerns exist for ecological impacts and disruption to local fishing, mitigation measures will be implemented.
- Research continues to be conducted on potential environmental impacts at a number of academic institutions.
- Until devices have spent significant time in the real world applications, environmental impacts can only be estimated.

SOCIOECONOMIC BENEFITS

- The power from ocean energy will be green electricity, using a renewable source of energy and not emitting greenhouse gases.
- This decreases the need for fossil fuels for electricity production and aids in combating the effects of climate change.
- Canadian green ocean energy will be in demand for energy exports.
- Ocean generated electricity is a method of reducing the risk associated with price fluctuations of convention fuel sources, creating energy price security.
- Utilizing a number of different energy sources aids in energy security, decreasing the reliance on a single energy source, and increasing energy self-sufficiency.
- Ocean energy project and device development will create direct jobs as well as employment for related industries such as marine manufacturing, engineering and oceanography, and power supply and service sectors.
- Ocean energy devices are being pursued for project development in remote regions not connected to electricity grid systems.
- Through the use of renewable energy sources such as ocean energy, these communities can decrease their reliance on diesel and use saved fuel costs for community development initiatives.