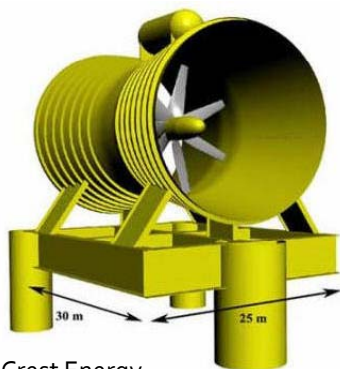
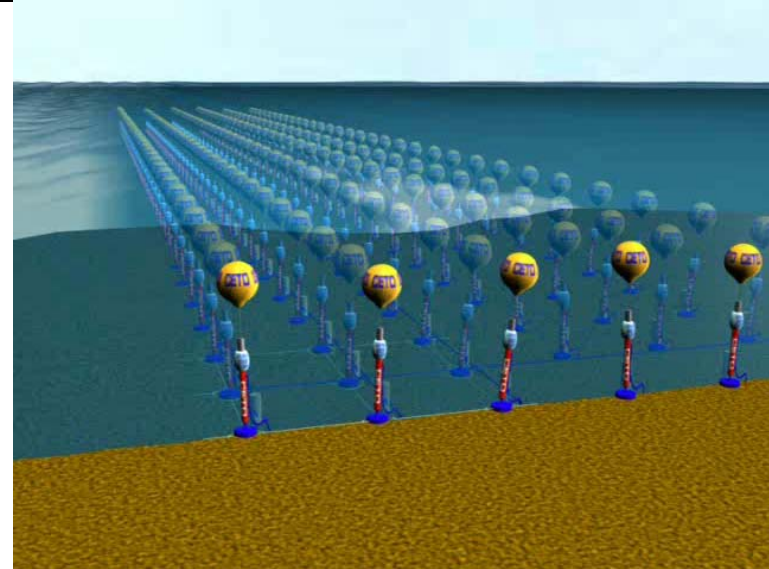


Climate change and ocean energy

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What is ocean energy?

- Renewable energy for the ocean
- Wave energy=energy of surface wind waves is used to produce electricity by devices installed on surface of the sea
- Hydrokinetic energy=energy of ocean (or fluvial) currents and tides captured by devices installed under the surface of the water
- Ocean Thermal Energy= using temperature differential between cold water from the deep ocean and warm surface water
- Osmotic energy= energy generated from pressure differential between salt and fresh water



Crest Energy

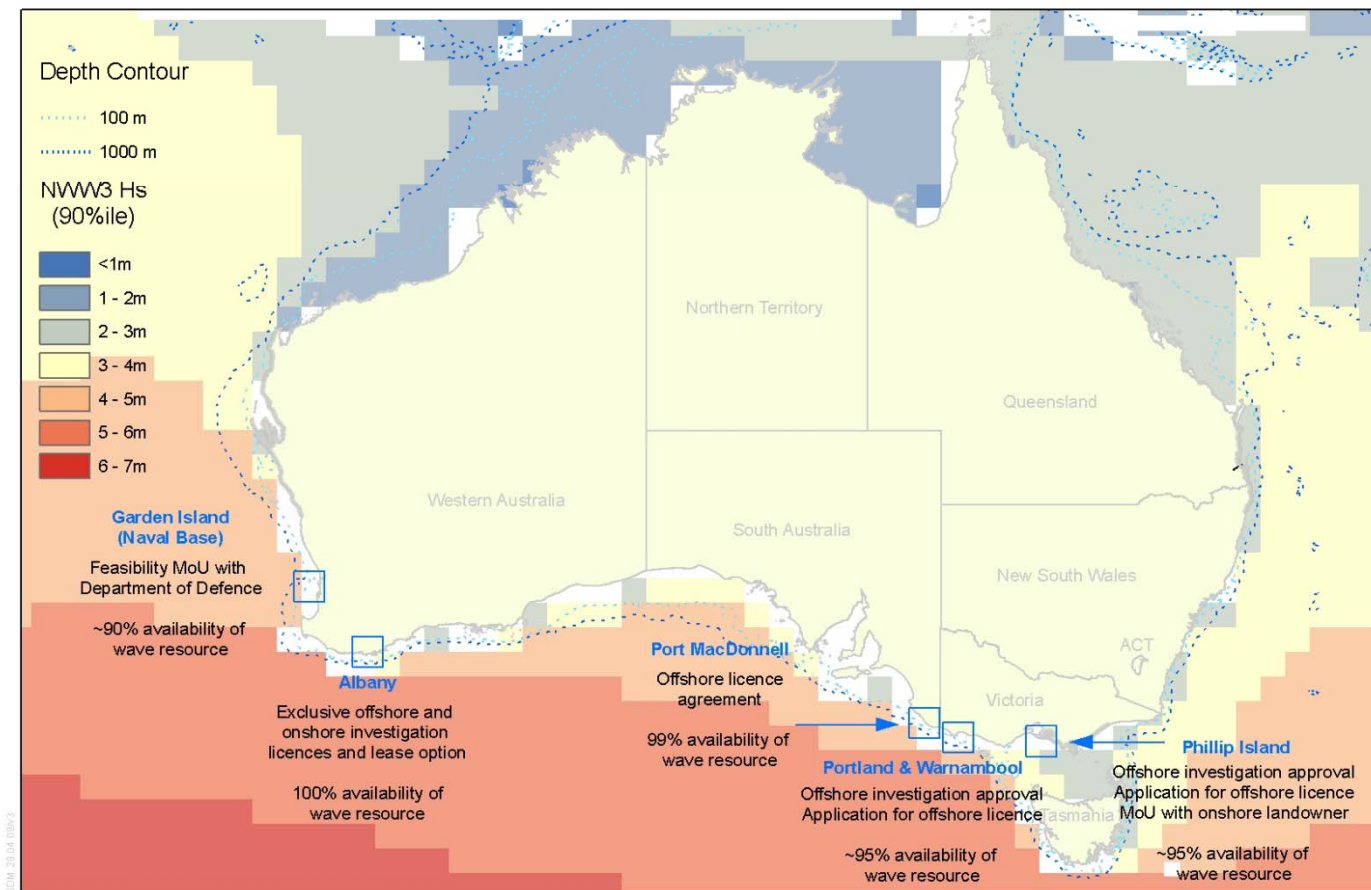


Biopower Systems



Carnegie Corporation

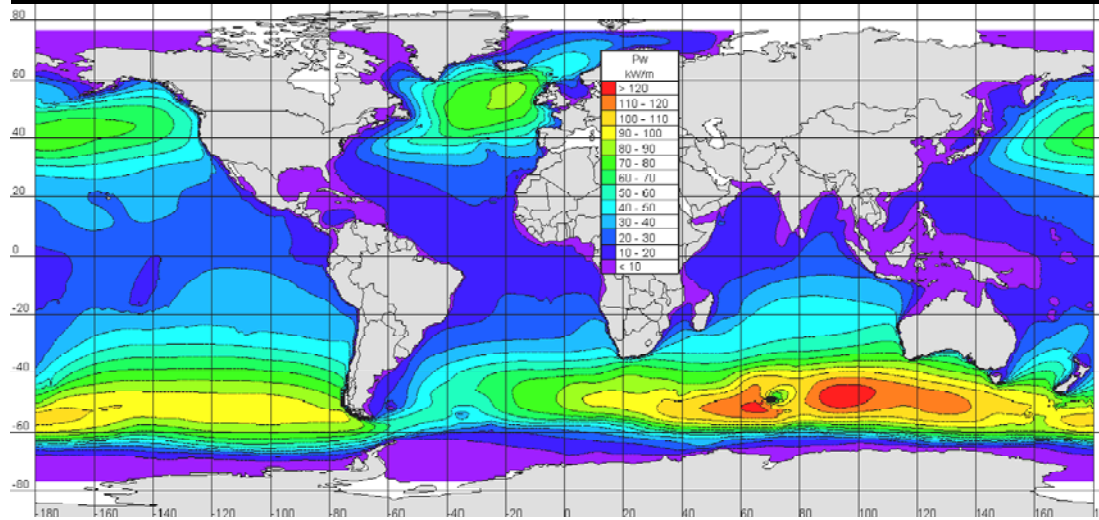
Ocean energy in Australia



Australian Commercial Project Pipeline

Source: Carnegie Corporation

What is the potential of ocean energy?



(Scruggs and Jacob, Science 2009)

- Estimated potential resource
 - Theoretical global potential between 20,000 and 92,000 TWh/year vs current global electricity needs 16,000 TWh/year (Soerensen and Weinstein 2008)
 - But realistically only about 3% of this is in locations where it is useable (World Offshore Renewable Energy Report)
 - UK- 55TWh per year = 14% national energy demand
 - Europe wide-280 TWh
 - USA- 255TWh per year= 6% of national energy demand (Scruggs and Jacob, Science 2009)



➡ Economic wave energy resources co-exist with much of the world's areas of power demand

Map source: Carnegie Corporation

Some of the emerging issues raised for policy makers

- Expanded funding for research and development
- Financial incentives
 - Carbon price
 - Feed-in tariffs
- Potential for expanded role in commercial development for the Clean Development Mechanism under the Kyoto Protocol
- Connection to the grid/infrastructure
- Regulatory uncertainty
 - Security of tenure/site title
 - Development approval
 - Multiple legislative instruments and approval authorities
 - 'one stop shop licensing authorities'
 - Limited application of existing regulation to the territorial sea
- Need to streamline environmental impact assessment processes
 - Uncertainty surrounding environmental impact
 - Strategic environmental impact assessment of offshore renewables
- Processes for reconciling conflict between stakeholders
 - Navigation rights
 - Hazards to navigation
 - Strategic environmental impact assessment of offshore renewables