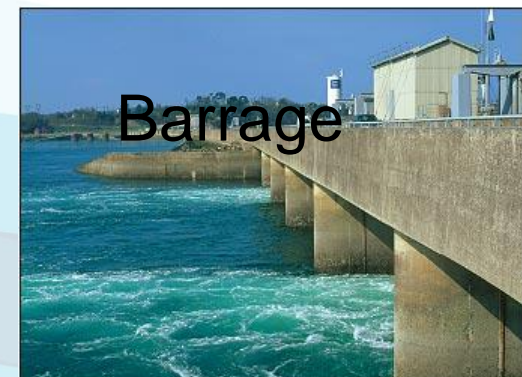




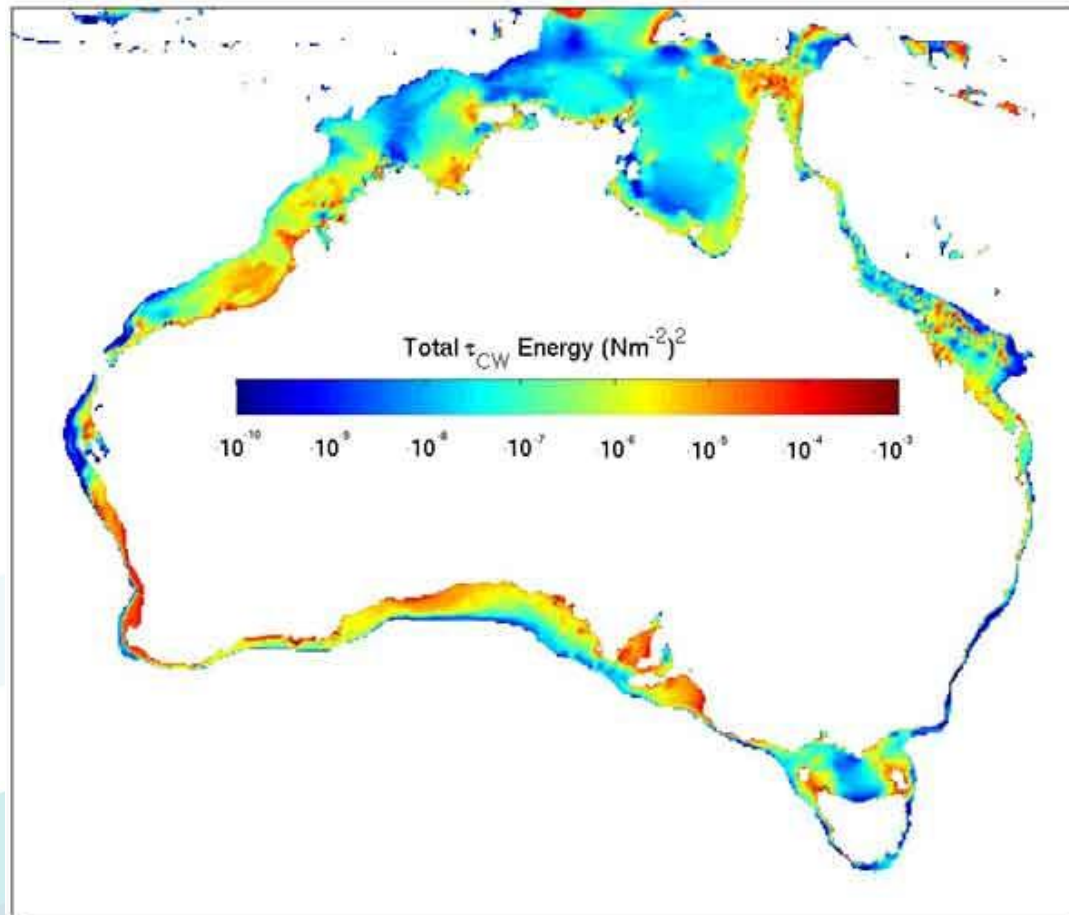
Thinking Critically About Sustainable Energy: Future renewables

Thinking Critically

Marine Energy



Marine Energy Resource



Total energy of the force experienced on the seabed as a result of surface ocean waves, tides and other ocean currents calculated from 7 years of model output for water depths <300 m. © Geoscience Australia

Wave Energy



Global resource

1-8 TW (8,000-80,000 TWh/Yr)

171,000 MW in Australia

Australian Developers

World-leading technology

Export earnings

Employment

Manufacture

R&D

Carnegie - Oceanlinx - OPT - Bio-power

Tidal Energy



Global resources released

Sites : Canada – Fundy
Scotland – 1.2GW
New Zealand – 200MW
Australia – 450MW

Australian resources

Clarence Strait
Banks Strait
Port Phillip
NW Western Australia
Backstairs Passage
Off-grid

Tidal Energy – Turbine Development

OpenHydro

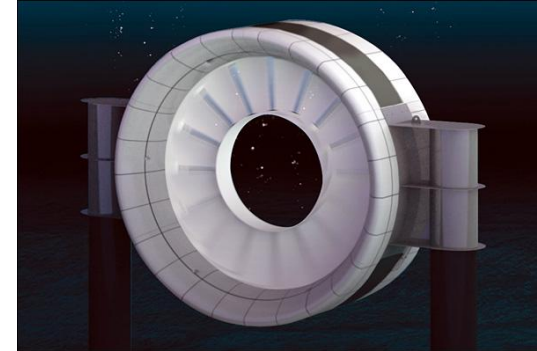
Tidal energy turbines are operating in:

- Scotland – EMEC (Orkney)
- Canada – Bay of Fundy

Has over 1GW of projects already in the pipeline

Focus on cost drivers

Forecast installed cost of €1.6m/MW by 2013 for utility scale facilities



Alstom Hydro

Purchased Clean Current global licence – expect to install commercially in 2013 - 2015

Tidal energy turbine operated in Race Rocks Reserve, Canada

Entered into a Confidentiality Agreement with Tenax Energy to develop tidal energy sites

Tidal Energy – Australian Turbines

Atlantis Resources

Tidal energy turbine are operating in Scotland – EMEC (Orkney)

Test site in San Remo Vic.

Offices in Singapore/London



BioPower

Wave and Tidal Energy projects

Test sites in Victoria and Tasmania

Site evaluations in Spain and USA

Marine Energy Opportunities

- **Supply Chain**
- **Heavy Engineering**
 - Wave Attenuators
 - Gravity Base
- **Installation**
 - Civil and Electrical Engineering
 - HVDC
 - Substations
- **Maintenance**
 - Mechanical, Electrical and Structure
- **Marine Operations**



**Delivering sustainable tidal energy
to Australian communities**