



Ocean Energy in Canada

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All-Energy 2007

Outline

- **OREG**
- **The Energy Resource**
- **Technology Activities**
- **Project Activities**
- **Provincial Activities**
- **Federal Activities**
- **Conclusion**



OREG

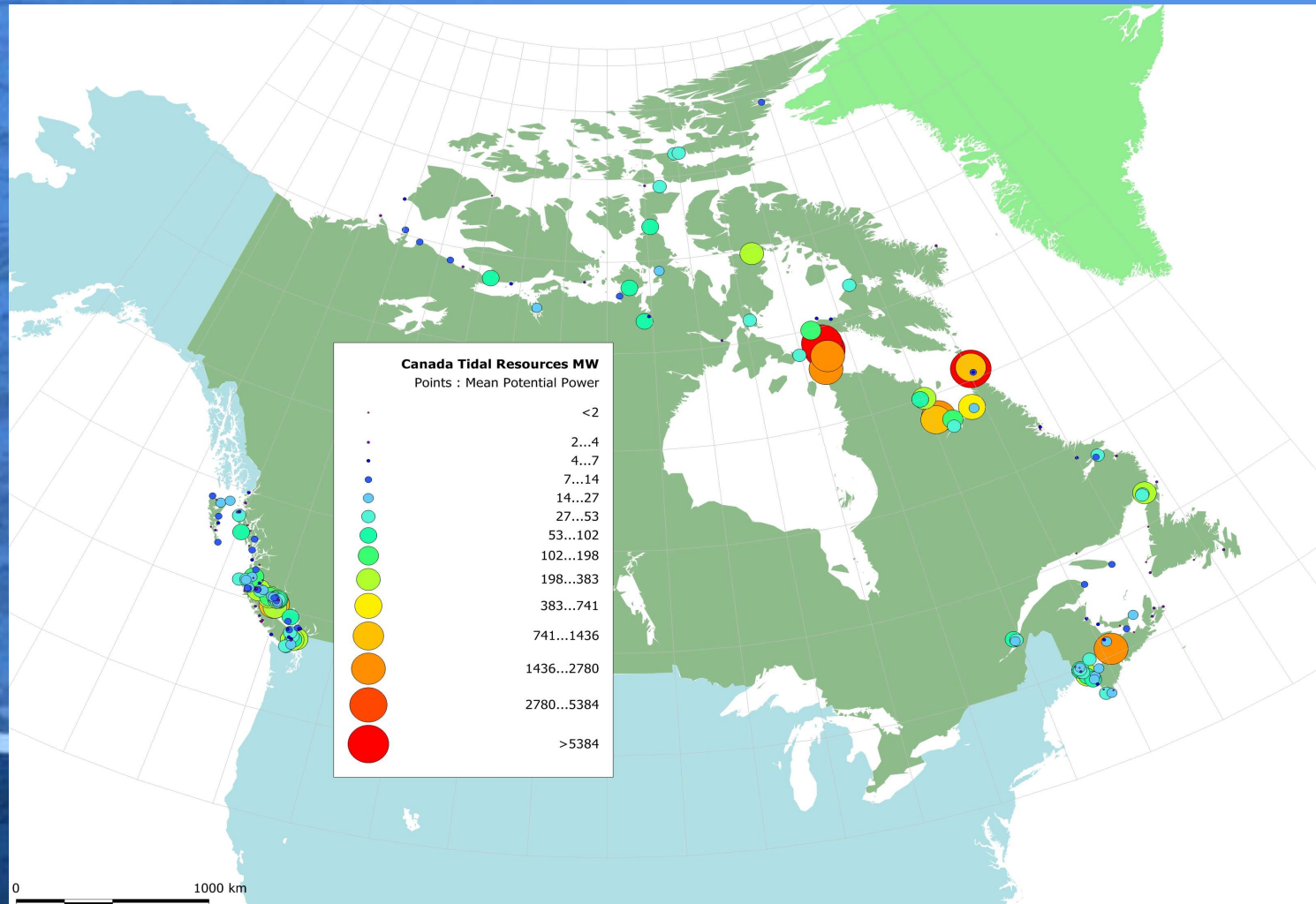
- **Formed in 2004 as sector development association**
- **Collaborative between industry, academia, government and utilities**
- **Mission to ensure Canada is leader in providing ocean energy solutions to the world market**

Tidal Energy Resource

Canada Potential Tidal Current Resource Sites

Tidal

Mean
potential
power
(MW)

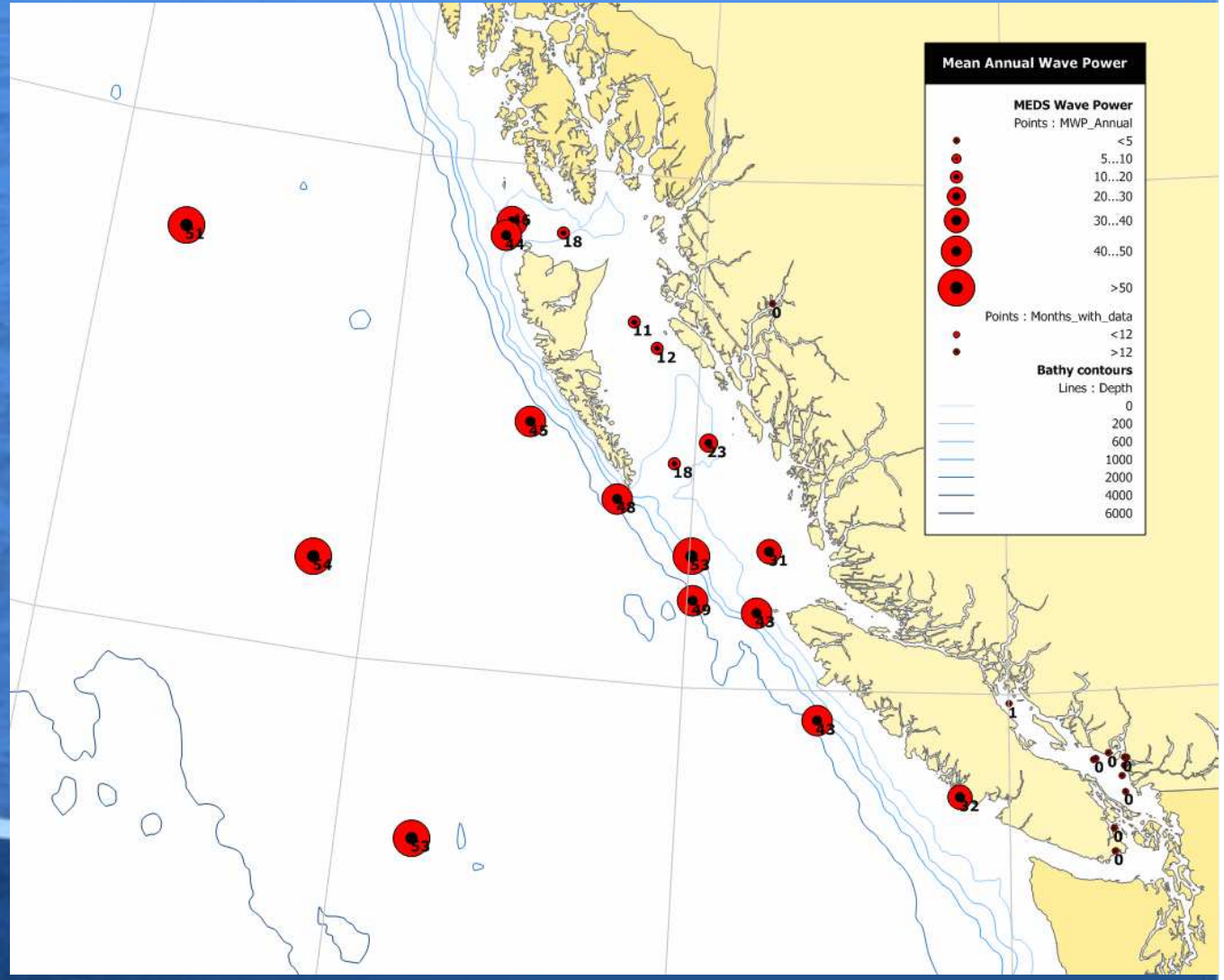


Tidal Energy Resource

- 190 sites identified
- Total mean potential exceeds 42,000 MW
- Nunavut has largest potential
- BC has most sites
- Peak flow of 2 m/s or more

Wave Energy Resource

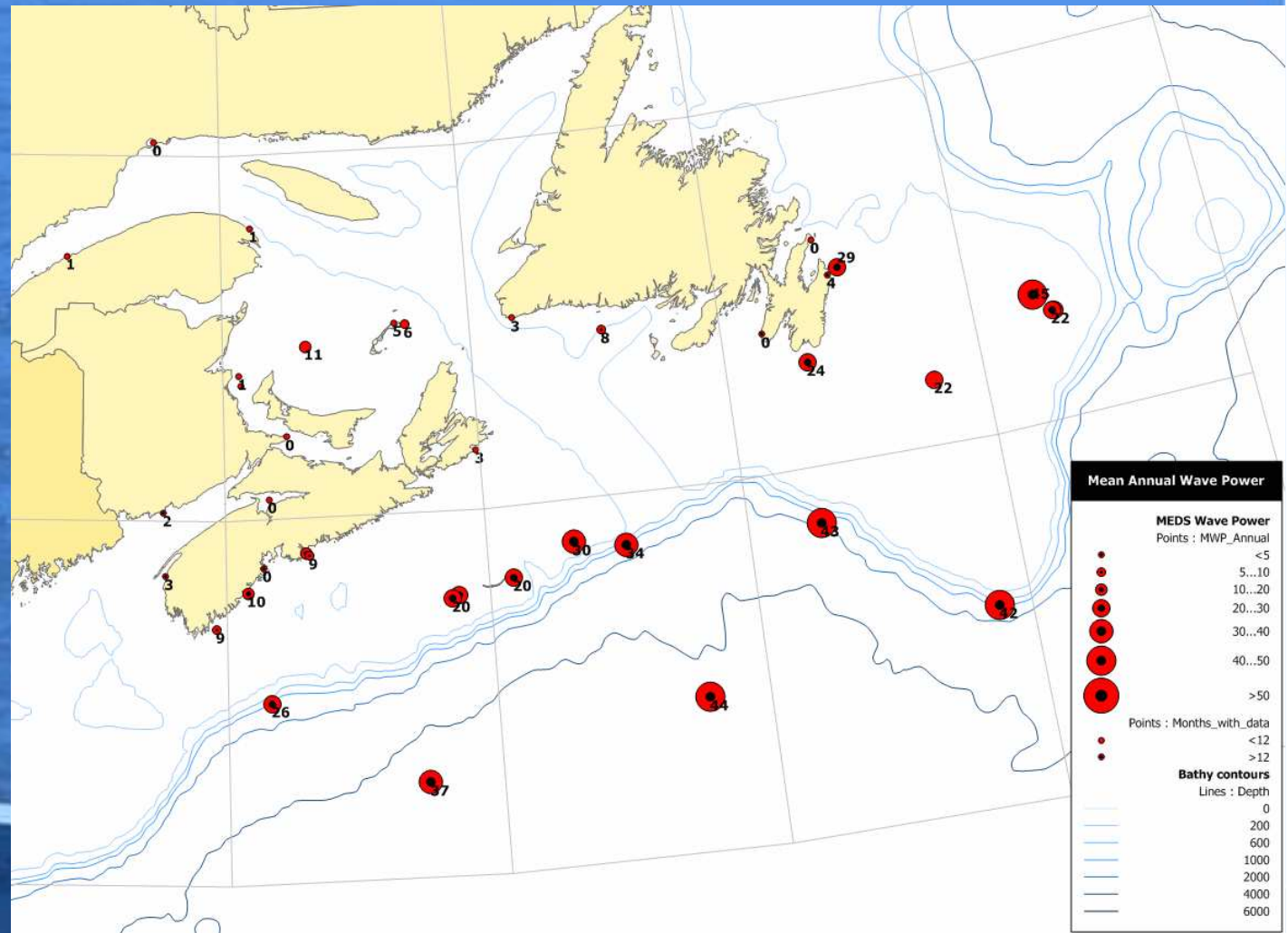
Annual mean energy flux from buoy data
Pacific Coast



Wave Energy Resource

Annual mean
energy flux
from buoy
data

Atlantic Coast



Wave Energy Resource

- Annual mean power along Pacific equals 37,000 MW
- Annual mean power along Atlantic equals 146,500 MW
- Peak resource in winter months

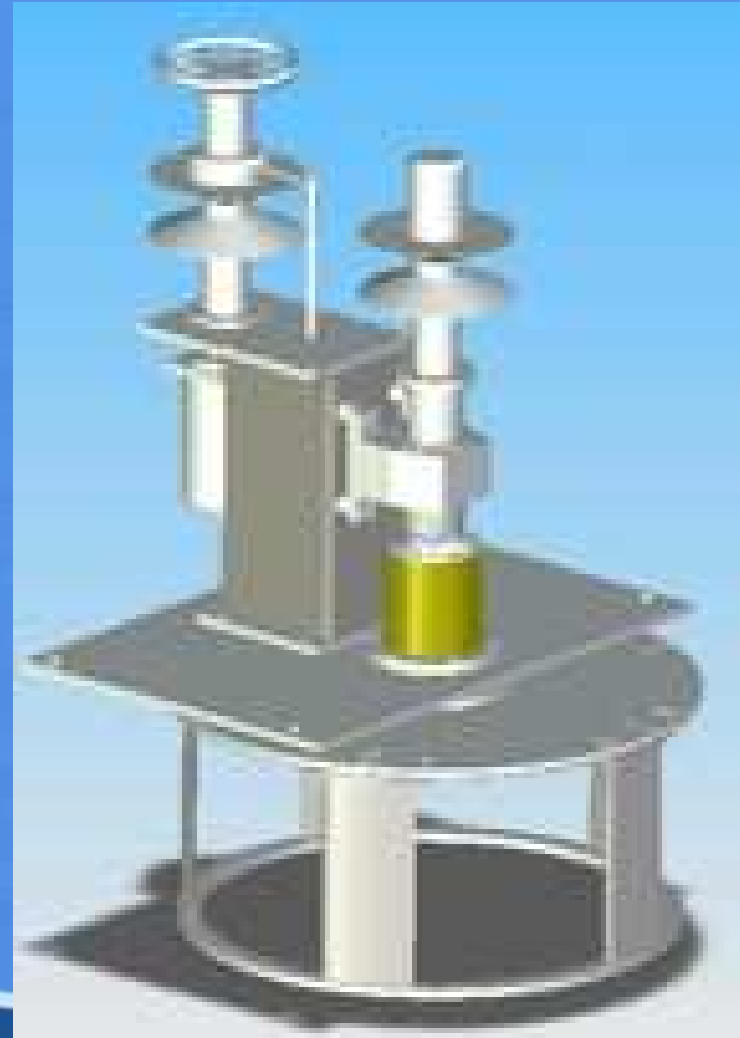


New Energy Corp.

**Vertical axis “EnCurrent”
turbine based on Davis
hydro turbine research**

**Tested 3 kW and 5 kW
prototypes**

**Currently designing turbine
for Canoe Pass
demonstration project**





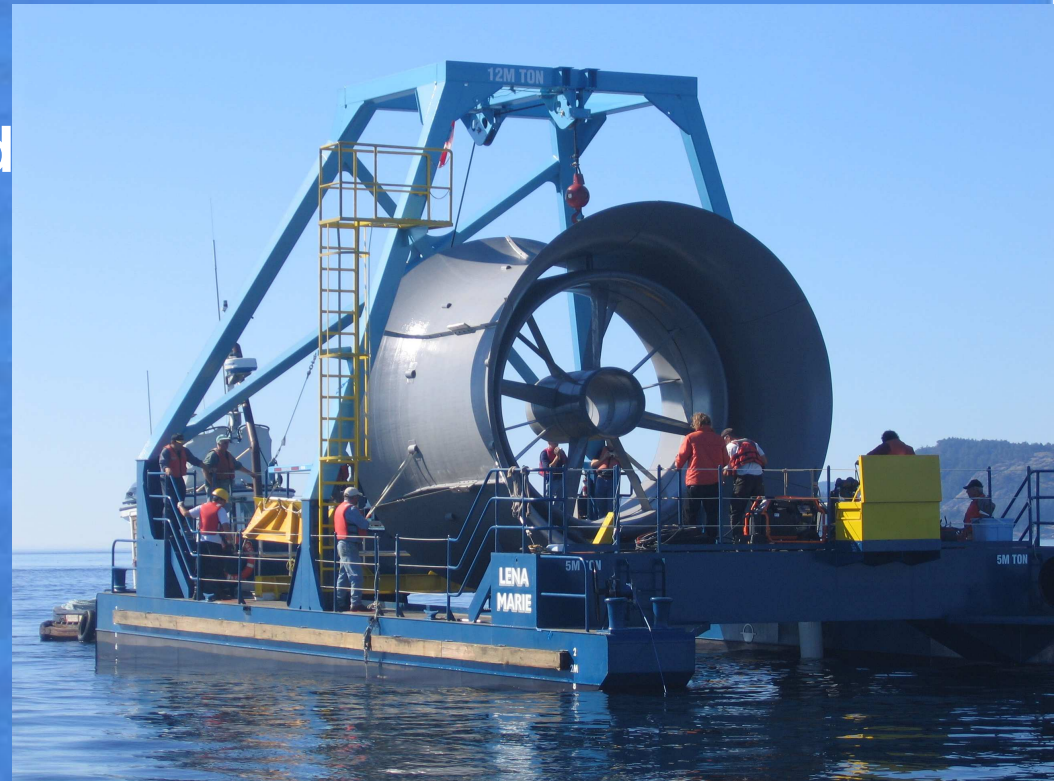
Clean Current Power

**Bi-directional ducted
horizontal axis turbine**

**Direct drive variable speed
permanent magnet
generator**

Race Rocks demo project

**Currently developing 19.5
m, 2 MW turbine for
installation 2009**



Blue Energy

Took on commercialisation activities after early Davis hydro turbine testing

Final prototype testing in UBC tow tank as part of WD agreement

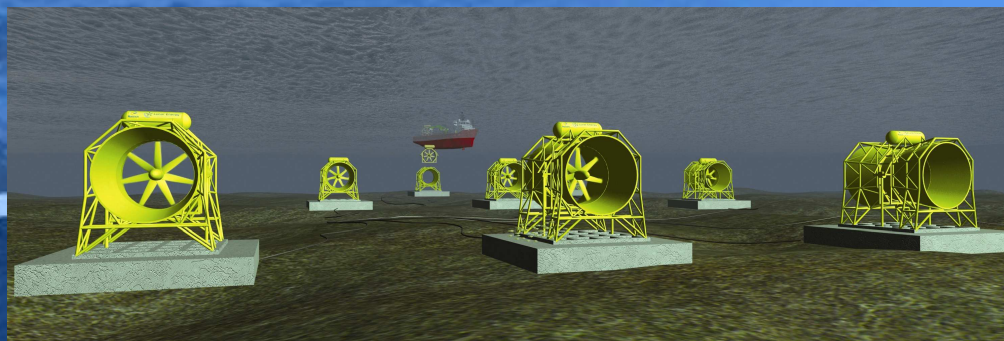
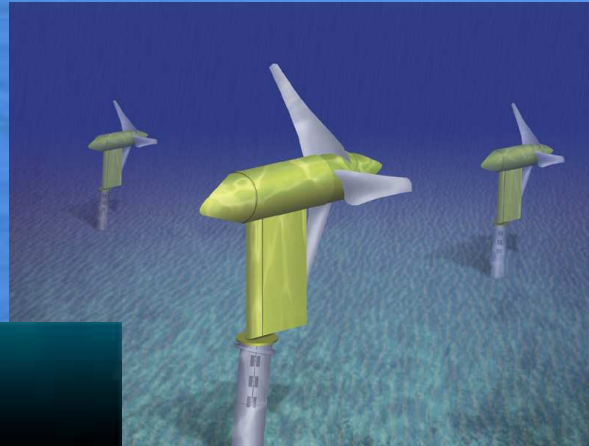
Completing details on demo project for later this year





Technology Activities

International
tidal device
developers





SyncWave Energy

**Resonating point
absorber**

**R&D continuing with
corrosion and stress
tests**

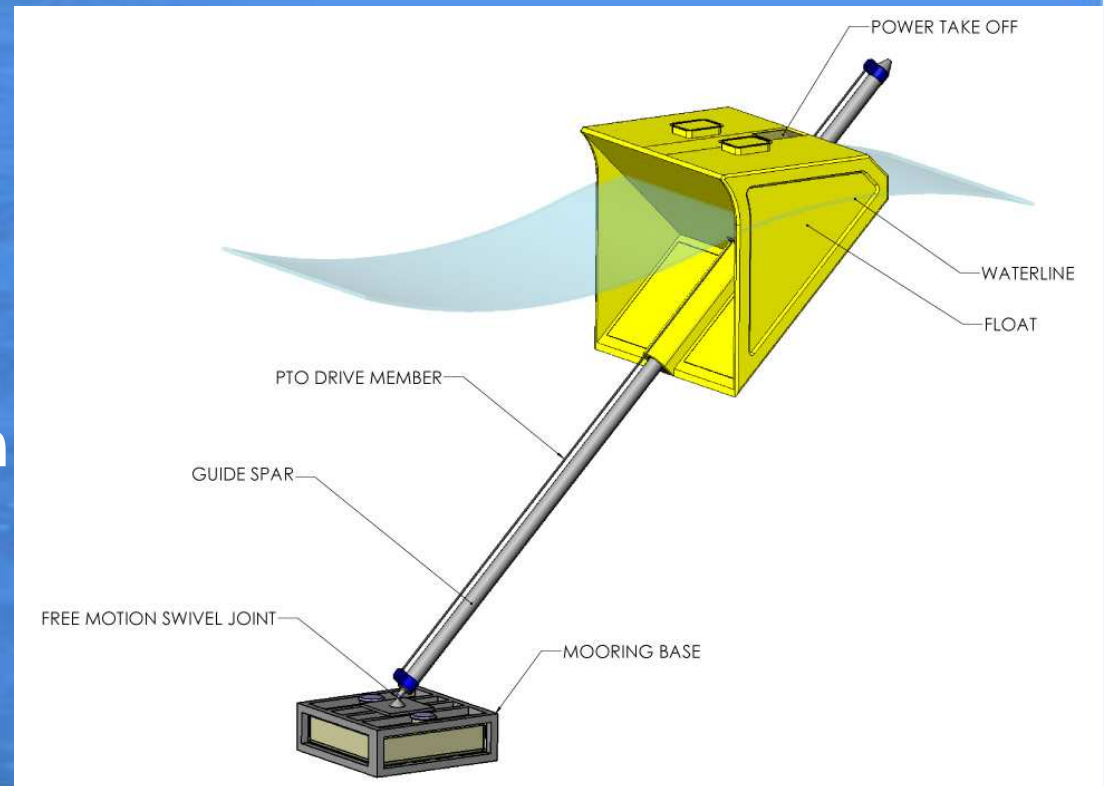
**Have identified four
prospective remote
power customers**

**Conducting resource
analyses**



Wave Energy Technologies

SmartFloat travels on spar, moored at single point, at 45°
Float fixed to synthetic cable which drives output shaft via capstan
Output shaft drives turbine – electricity or desalination



Technology Activities

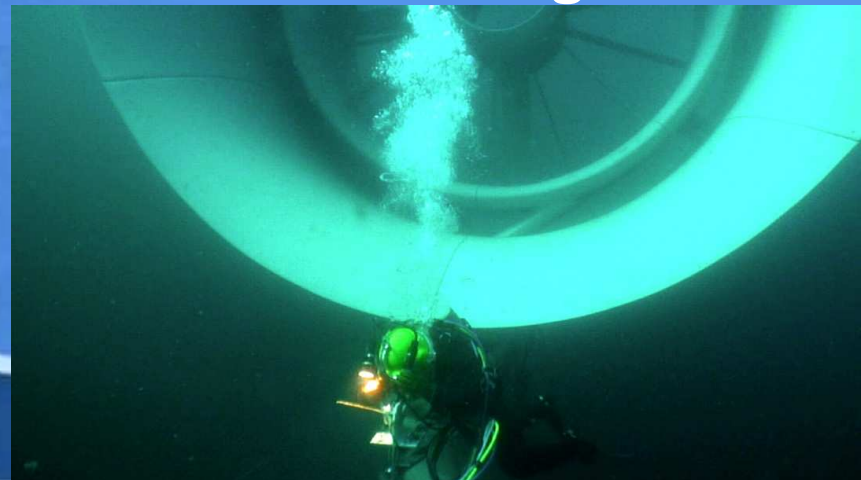
International wave energy
device developers



Project Activities

Pearson College – EnCana – Clean Current Tidal Power Demonstration Project at Race Rocks

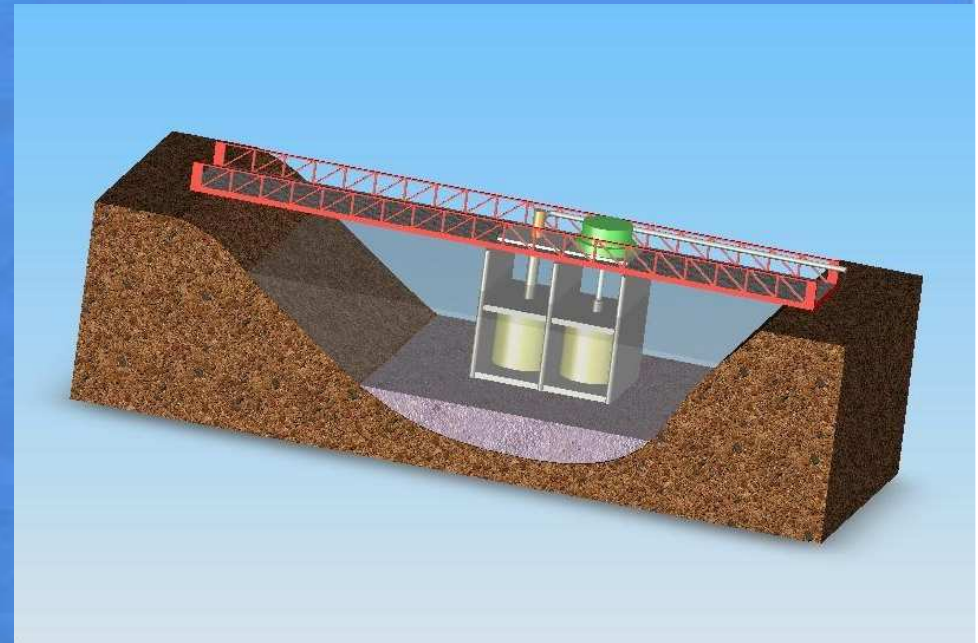
- 60 kW turbine installed in Sept 2006 – first system of its kind in world
- Generator, blade and duct have met or exceeded expectations
- Taking up this week for inspection and bearing replacement



Project Activities

Canoe Pass Tidal Demonstration Project

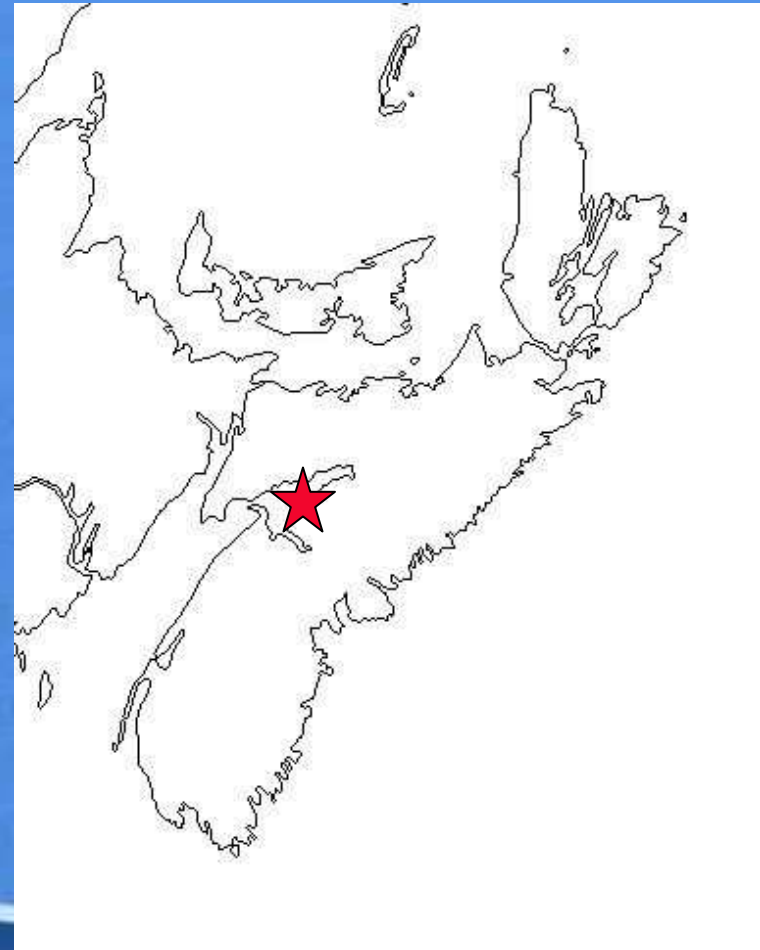
- Permit applications underway
- 500 kW capacity, New Energy EnCurrent turbine
- Currently expanding proposal for testing facility



Project Activities

Nova Scotia Power

- Operators of Annapolis Tidal Power Station
- Currently in a federal funding process
- Announced choice of Open Hydro as technology partner in \$12m project



Project Activities

Coastal Hydropower

- Operating rights for Gorlov turbine and Davidson & Hill ducted turbine for use as Combined Technology
- Plans/agreements for deployment in Campbell River area, Sonora Island, and Columbia River
- Other sites identified on BC coast, rivers in BC, Yukon, Alberta, ON, WA and Alaska



Provincial Activities

East Coast

- Nova Scotia Dept. of Energy conducting a \$250,000 SEA in the Bay of Fundy and \$500,000 on research on tidal energy and the environment
- Nova Scotia gov has developed tidal energy framework for project approvals
- New Brunswick government working with Nova Scotia and developing energy strategy which will include tidal power

Provincial Activities

West Coast

- **Project Application Directive**
- **Ocean Energy Policy under development**
- **New Energy Plan – standing offer contracts for projects <10 MW, ocean energy research chair, \$25m innovation fund, self-sufficiency by 2016**
- **Considering possibility of sites to profile for 2010 Olympics**

Federal Activities

ecoEnergy Technology Initiative

- \$230m for technology R&D and demonstration
- Renewable production incentive 1 cent per kWh

Tax Incentives – flow through shares for expenditures and tax breaks for scientific research



Conclusions

- **Recent increase in government environmental, energy, and ocean energy initiatives at provincial and federal levels**
- **New demonstration projects to come online in 2007 – looking to turn them into testing areas**
- **Increasing international collaborations**



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