

Marine energy policy and strategy in Canada

Chris M Campbell Ph.D
Executive Director



The power to think bigger.

Reality!



- Strategy exists in the sector association
 - Membership includes governments, utilities, project and technology developers and suppliers
 - We have been an influence on policies and strategies to build an industry at home and abroad
 - Government strategies came after policy initiatives
- Vision has always been creating a new power producing industry



Our focus



- Facilitating access to a place where industry can grow
 - FORCE – the world's only 20+MW offshore connection facility
 - Emerging legislation in NS and Operational Directive in BC
- Creating a market force to pull industrial approaches and mobilise a new industry project development team
 - COMFIT and Array FIT in place in Nova Scotia
 - Emerging Energy FIT enabled by the BC Clean Energy Act
- Promotion of Innovation Acceleration and strategic collaboration
 - FORCE's strategic research and array-scale capacity
 - Networked academic and industrial research
 - Priority setting – OERA programme, FAST project etc

Our strategy



- Aim where the leaders in the sector will be
(Gretsky)
- Pursue the proof of concept that the electricity industry, governments and the consumer need to see
 - Grid connected power
 - Scale appropriate to grid and to learning about integration
 - Reliability and performance needed of a power plant

Our goals



- For Canada to be among the first to demonstrate power generating arrays as power plants
- To demonstrate Canadian supply chain capabilities in these early adopter projects
- To use this experience to pursue a world market as it opens
- To demonstrate the value proposition for development of Canada's marine renewable resources

Our progress



- Slower than we wanted, but
 - All eyes are on Nova Scotia – the ingredients are there!
 - We have a strong association preparing for its second decade
 - We have expanding industry and research community interest
- Canada hosts the world's industry developer conference for its first time outside Europe in 2014 – ICOE 2014 in Halifax

Nova Scotia tidal – world lead

- Second change in government remains committed to continue the economic development tidal strategy
- 5 existing approved COMFIT projects
- UARB likely to deliver ca \$500/MW market for 10-20MW of pilot plants – November 15??
- NS expects development plans from the 3 FORCE incumbents by Dec 16
- NS Expects proposal/development plans from potential Berth D players

Significance of FORCE

- Unique 64MW offshore interconnection for tidal
 - UK WaveHub is closest – 20MW for wave
- First 5MW permitted by Fed/Prov roundtable effort
 - CEA regs amended raising EA trigger to 50MW
 - NS intends to lead Fed/Prov facilitation again
- Strategic research programme
 - Resource knowledge
 - Environmental issues
 - Monitoring in high-energy environments (FAST project)

Evidence of the significance - new

- Berth D bidders – (mix of knowledge/speculation here)
 - Project developer/operators
 - DP Energy
 - Bluewater Offshore
 - Technology developers
 - Andritz
 - OpenHydro
 - Schottell
 - Voith

Evidence of the significance - existing

- Berth A– Minas Energy
 - With Siemens and others
- Berth B- Alstom
- Berth C– Atlantis Resources
 - With Morgan Stanley, Lockheed Martin and JD Irving
- Collaborations
 - European Marine Energy Centre
 - Ocean Networks Canada

British Columbia-Pacific portal

- Standing offer extended to include prototyped/non-commercial technology
 - Utility showing flexibility to try something new
- Emerging Energy FIT included in Clean Energy Act
 - Potential create market entry
- Start with focus on small-scale
 - Replacement of diesel generation
 - Partner with existing industry – Aquaculture, Tourist lodges
 - Prototypes for northern, island and isolated communities or industrial operations
- Demonstrate: project developer to technology supply chain

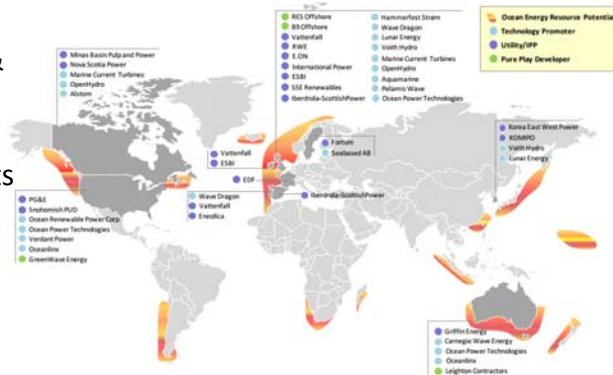
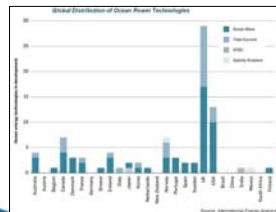
Opportunities

- Wave energy
 - Electricity
 - Potable water
 - Breakwaters
 - Tidal currents
 - Electricity
 - River and canal currents
 - Electricity
 - Flow control
- Economic opportunities in a new industry***

Global Market & Opportunities



- Hundreds of patents & designs
- Growing number of demonstration projects
- Handful at full-scale testing



(image: Emerging-Energy Research, 2010)

Lessons on strategy



- Electrical system operator prepared to
 - integrate and work with new technology and resource characteristics
- Government prepared to
 - Commit to using marine resources for economy, energy etc
 - Use adaptive management to permit new marine activities
 - Use policy to create a market driver
 - Level playing field with incumbent approaches
- Industry prepared to
 - Innovate and provide site specific solutions/products
 - Reliable electrons
 - Water, etc

Fundamentals



- Marine Renewables are not yet competitive with others, but,
 - Their energy density is 50-100x higher
 - They are at the steepest part of the cost reduction curve
- Marine Renewables will be cheap and widely available
 - Need to recognise they will be part of the energy and marine industry future
 - Need to engage early to
 - Learn about the potential
 - Get local industry ready to take a part
 - Plan for its integration into energy systems

Choice?



- Start with a strategy (UK)
 - Involves all, coordinates all players
 - Sets targets
 - Invites collaboration, or,
- Act tactically, but think strategically (Canada)
 - Build toward a strategy step by step
 - Use early wins and be opportunistic
 - Be prepared for setbacks
 - Depend on someone to keep an eye on the strategic direction

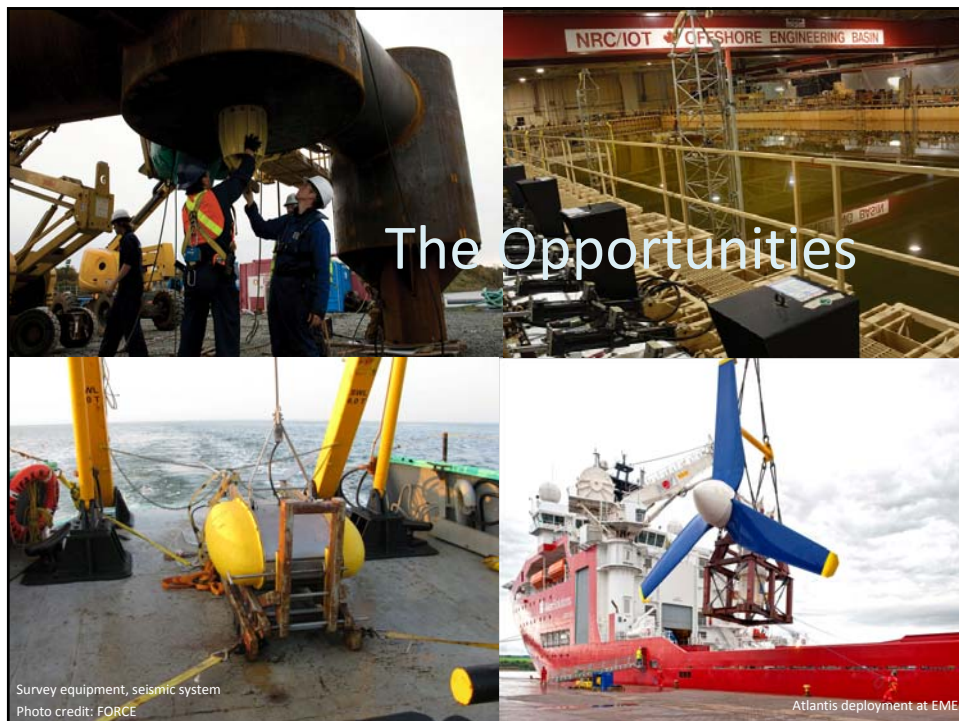
Final Score



The world's pioneer ocean power plants are going to be built in UK, France and Canada

- In the next few years
- Involving many of the same players

So both approaches can work, if you aim between the same goalposts.



marinerenewables.ca

GET IN TOUCH

Chris Campbell, *Executive Director*
Email: chris@marinerenewables.ca
Phone: 250-754-0040

Elisa Obermann, *Atlantic Director*
Email: elisa@marinerenewables.ca
Phone: 902-817-4317

From Prototyping Technology to Prototyping an Industry
November 20-21, 2013 The Westin, Ottawa,
Ontario

ICOE 2014 – the world's fifth industry developer conference
First outside Europe



The power to think bigger.