

# Marine Renewable Energy- Progress depends on the vision!

---

**Chris Campbell**

July 2015



marine  
renewables  
canada

The power to think bigger.



# Marine Renewables Canada

- National industry association for marine renewable energy
  - Covering wave, tidal, and river current energy
  - Established 2004
  - Offices on Pacific and Atlantic coasts
- Members:
  - 90 members representing technology and project developers, utilities, researchers, and the energy and marine supply chain

## ***Mission:***

*Marine Renewables Canada aligns industry, academia and government to ensure that Canada is a leader in providing ocean energy solutions to a world market.*



# Why?

- To provide new sources of electricity
  - Competitive in price
  - Reliable
  - Distributed generation
  - Forecastable or predictable availability
  - Low carbon content
- To secure business and economic activity
  - New activity for marine and electrical industry
  - Participation in a new world market



# What?

- Electricity generation from rivers and oceans presents an untapped renewable energy source and is an emerging industrial sector.
- Marine energy is captured from three prime energy sources
  - Tidal current: kinetic energy from the ebb and flow of the tides
  - River current: kinetic energy from the stream flow (no civil infrastructure or barrages)
  - Wave: potential and kinetic energy from ocean waves



# Who do we need to impress?

- Purchasers of electrons
- Power project developers
- Supply chain
- Lenders
- Investors
- Certification agencies
- Insurers, etc.

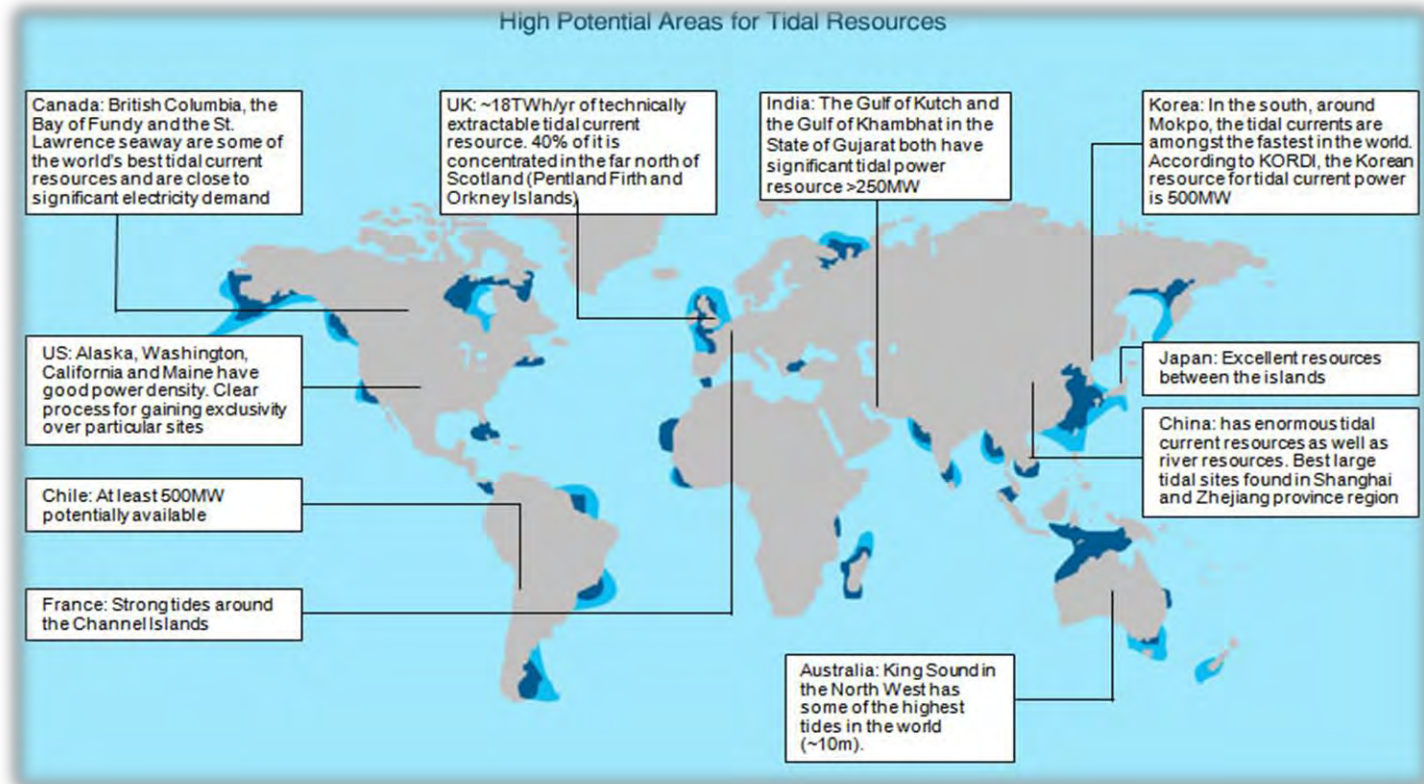


# What do they need to see?

- Movement to competitive cost of energy
- Ability to meet in-service dates and reliable energy supply
- Plant scale that meets market needs
- A solution that can be replicated in a larger market

**So, it is a project developer story – supported by technology maturation**

# Global market opportunity



- Resource potential = 10-15% world electricity consumption
- 748 GW of ocean energy by 2050
- 160,000 direct jobs by 2030
- Nearly 200,000 careers by 2030, deploying 5 generators a day
- Save up to 5.2 billion tonnes of CO<sub>2</sub> by 2050 (*IEA Ocean Energy Systems*)
- Global expenditure potential: \$900-\$1,000 billion value by 2050



# The Challenge we all face

- We have been at this for 15 years
- We have had major delays on almost all projects
- We have lost some leading technology players
- There has been focus on technology
  - Not reliability, installability, operability
- **It all comes down to project finance**
  - Is it worth it? – Scale.
  - Is it worth it? – electricity market, capital assistance.
  - Who assumes the risk? – warranties, loan guarantees, project team, etc





# The Example of Tidal

- UK
  - The Meygen project is financed and moving ahead on phase 1A
  - DP Energy and Atlantis as developers of others
- France
  - EDF and Engie developing at least two projects
- Canada
  - Developers; Emera, Minas Energy, DP Energy and Atlantis
  - Technologies; Andritz, Bluewater, MCT, Open Hydro, Schottel, Tocardo, Nautricity

# Canada's Bay of Fundy - strategy



- Safe extraction target >> 2GW
- The right FIT for the first stage
- A supportive Government and public
- Shared infrastructure to reduce costs and risks for the first stage - FORCE
  - Access to installation experience and 64 MW of offshore connection
  - Facilitated permitting, environmental research and monitoring
- Access to transmission capacity
- A strong shareholder owned energy company
  - A vision for a hydro-backed regional resource development, enhanced grid interconnection and electricity market development
- Engagement of the worlds leaders
  - Emera, Atlantis Resources and DP Energy as developers
  - Open Hydro, Andritz Hydro, Marine Current Turbines, Atlantis, Schottel, Bluewater, Tocardo, Nautricity as technology providers

An industrial development strategy – the 300MW prototype!

# Canada's Bay of Fundy - timeline



- 2015
  - MRE legislation in effect
  - Planning for next commercial site underway
  - FORCE - Open Hydro 2 devices – 4 MW
- 2016
  - FORCE Schottel staged deployment of 2.5 MW
  - FORCE Atlantis deployment of 1.5 MW
  - FTI Digby Neck deployments
  - Potential for new licenses at FORCE
- 2017
  - New Commercial Site area identified
  - Deployments by Minas Energy, DP Energy + expansions
  - Potential License Call in new area
  - FTI Further deployments
- 2018-2019
  - Balance of deployments
  - 20-50 MW of tidal energy
  - 50 MW+ Federal EA filing
- 2020
  - Expansion to 300+ MW

An international development happening in Nova Scotia!

# GET IN TOUCH

Elisa Obermann, Executive Director

**email:** [elisa@marinerenewables.ca](mailto:elisa@marinerenewables.ca)

**phone:** 902.817.4317

**web:** [www.marinerenewables.ca](http://www.marinerenewables.ca)



marine  
renewables  
canada

The power to think bigger.