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The Ocean Renewable Energy Group

Building the enabling environment for wave and tidal energy in BC + PNWER/regional approaches

Chris M Campbell PhD

Executive Director

Ocean Renewable Energy Group

OREG?

- 80+ member sector leadership association
- Canadian, UK, US and Aus members
- Nurture technology and project developers
- Stimulate utilities
- Advocate with governments
- Stimulate R,D&D
- Communicate - www.OREG.ca, Bi Weekly News to 1,000
 - Finance and supply chain
 - Community and public

BC Energy plans

- 2002
 - Focus on enabling independent power producers - no new BC Hydro generation
 - Accidentally killed the first two utility wave projects
- 2007
 - Clean and renewable electricity - 0 net GHG
 - Self sufficiency under low water conditions
 - Pursuit of innovation/economic opportunities
 - Conservation

BC Energy Plan - A vision for Clean Energy Leadership

- Self sufficient by 2016
 - For growth minus 50% by conservation
 - Biomass power development
 - Continued calls for competitive IPP bids
 - Standing offer for <10MW projects
 - Transmission investment
 - Focus on renewable for remote communities
- Role of Utilities Commission
 - Robust bidding
 - Recognise the value of aggregated intermittent resources
 - Consider social and economic costs/benefits

Outstanding issues

- Standing offer
 - Proven technology
 - Price set by latest commercial call
- Long-term Acquisition Planning
 - Only considers immediately available and commercial technologies

The economic and energy opportunity in wave and tidal will be missed!



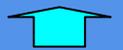
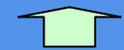
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OE Accelerated Development Initiative

The renewables innovation system

Prototypes Small demonstration arrays / grid connected Large scale arrays Commercial plant



Wave / tidal to date

Need for learning, innovation and appropriate support

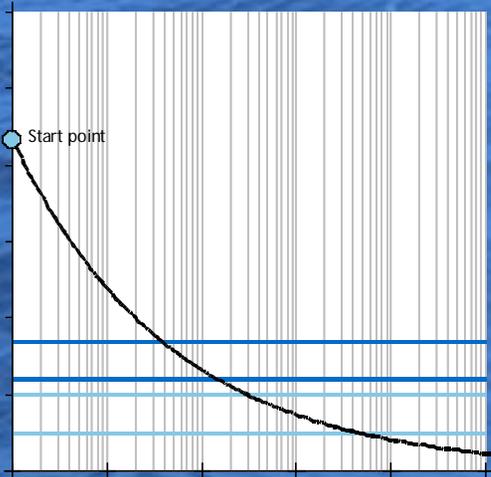
Offshore Wind

Onshore wind

Start: First grid connected prototype

End: 50-100MW farms / arrays

Carbon Trust analyses of technical and cost progress for ocean energy

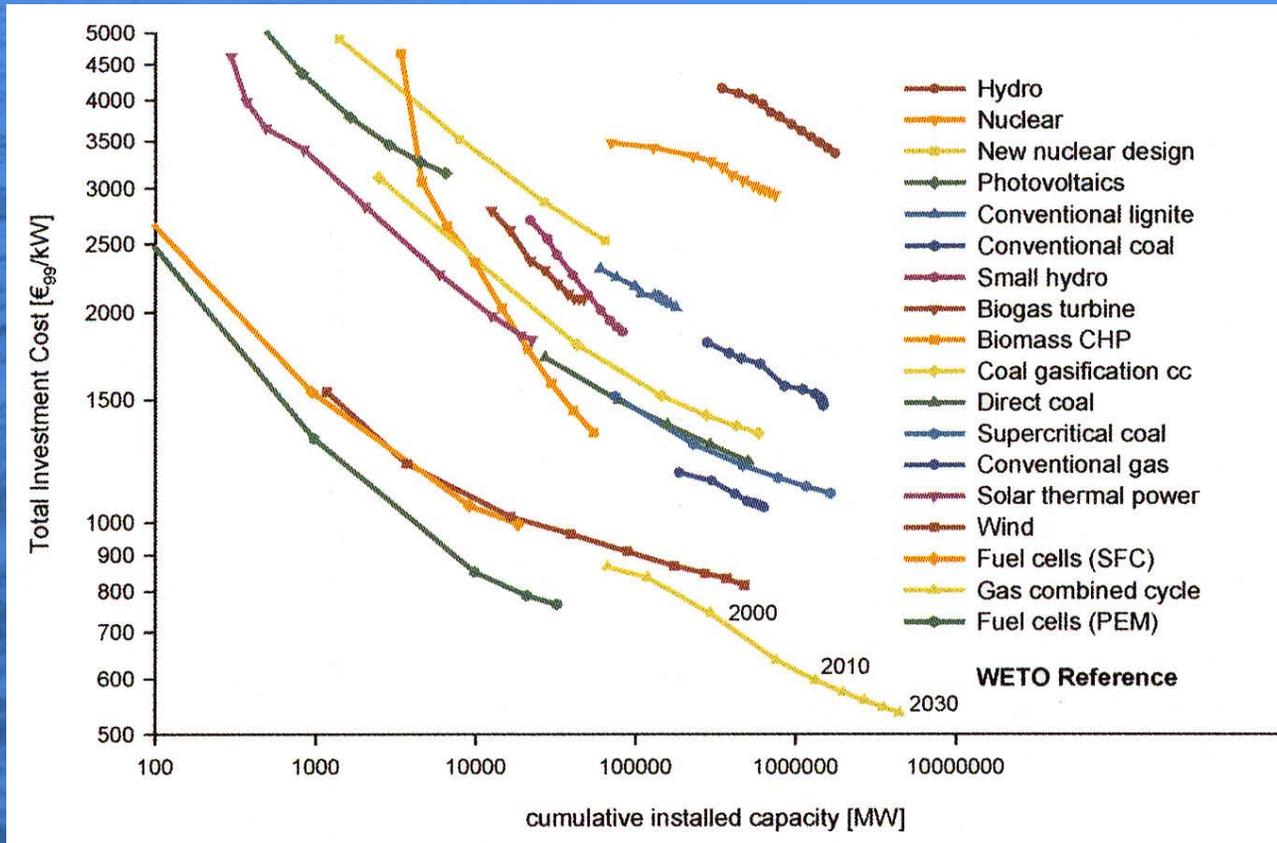




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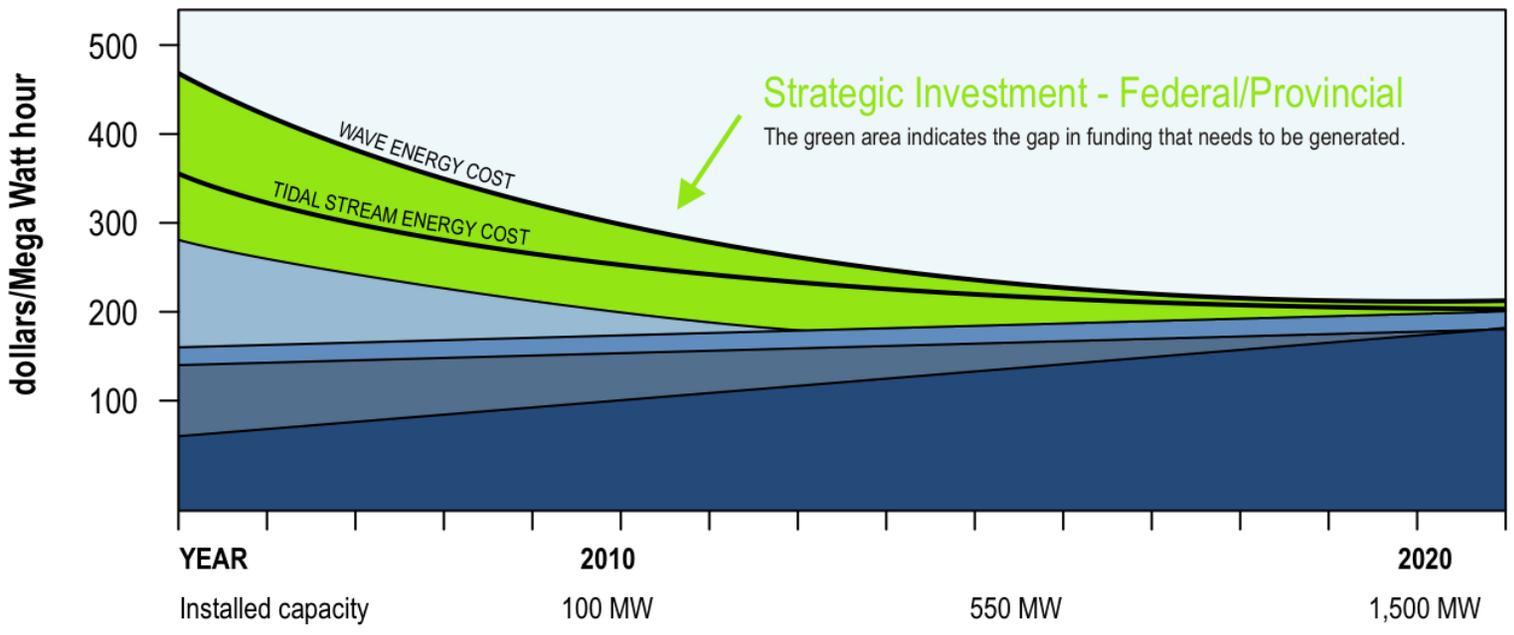
Not a unique challenge



Canadian Renewable Ocean Energy Accelerated Development Initiative

Filling the Market Path

Meeting the enabling costs of ocean power projects



LEGEND

- Commercial electricity purchase price
- Utility premium
- ecoEnergy incentive
- SDTC/SR&ED programmes
- Cost / Price gap

CURRENT PRICE / MEGA WATT HOUR

Solar	\$400 - \$500
Wind	\$50 - \$100
Hydro, gas, coal	\$20 - \$60

The costs of early ocean projects will be higher than its final commercial cost. An Accelerated Development Initiative will bridge the gap between cost and energy prices to get access to commercial ocean energy as soon as possible.

A priority for Market Support

- Lack of clarity of “Path to Market” stifles investment
- Market and capital risk must be reduced
- Long term support required
- Must provide bridge into long-term renewables market
- Puts priority on gaining power production experience
- Engages private investors who will be critical in commercialisation
- Can be built as stepped price incentives

Builds an ocean power delivery industry - not an R&D focus



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- Ideally, a feed-in tariff would create a market driver for the early projects
 - Would allow technology, operating, integration and environmental monitoring experience development
 - Would pioneer financing and project development needed in the commercial phase
- Infrastructure support would decrease capital exposure and enable projects at lower power prices
 - Facilitated permitting
 - Shared interconnection and integration costs



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Development Centres

- UK Wave Hub
 - Permitted, grid connected and power purchase in place
- European Marine Energy Centre
 - Developed as test facility and being used by Scottish Power as facilitated power project site
- Portuguese Development Zone
 - Being copied by France?
- Atlantic Provinces - exploring multi technology experience development park

For Pacific Northwest?

- Small scale tidal
- Wave/diesel integration
- Deepwater tidal
- Open ocean wave
 - Grid/distribution integrated
 - Shared permitting costs
 - Shared interconnection and integration costs
 - Shared monitoring costs
 - Shared knowledge
 - Shared risk of sector setbacks
- Public good - public private partnership?



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Why?

- 10% of regions electricity from wave and tidal by 2050?
- Integrated offshore wind/wave and tidal makes QCI and VI powerhouses
- 5- 10 jobs/MW manufacture/installation
- Operation/maintenance need 0.03-0.1 jobs/MW
- World market can be accessed

PNWER Agenda

- Regional Resource Picture
 - Resource
 - Match with grid and markets
 - Regional opportunity
- Strategic investments to secure an ocean energy opportunity
 - Experience curve
 - Enabling financial investment
- Enabling the Ocean Energy opportunities
 - Early projects as PPP Development Initiatives
 - Intergovernmental sharing of experience
 - Intraregional development communications



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Discussion points

- Ensuring ocean energy is in the utilities long term resource plans
- Practical resource analysis
- Pacific Coast collaborations
- Regional expertise and supply chain development

Follow up actions

- Continued resource analysis and expanding BPA project to include California
- Using Energy Horizons to connect utilities
- Formation of a PNW Working Group
- Localised funding from all levels