Bonding and Security for In-Stream Tidal Energy Projects

force | Fundy Ocean Research Centre for Energy


FORCE is both host to developers
and project steward
force

MARINE RENEWABLE ENERGY IN CANADA

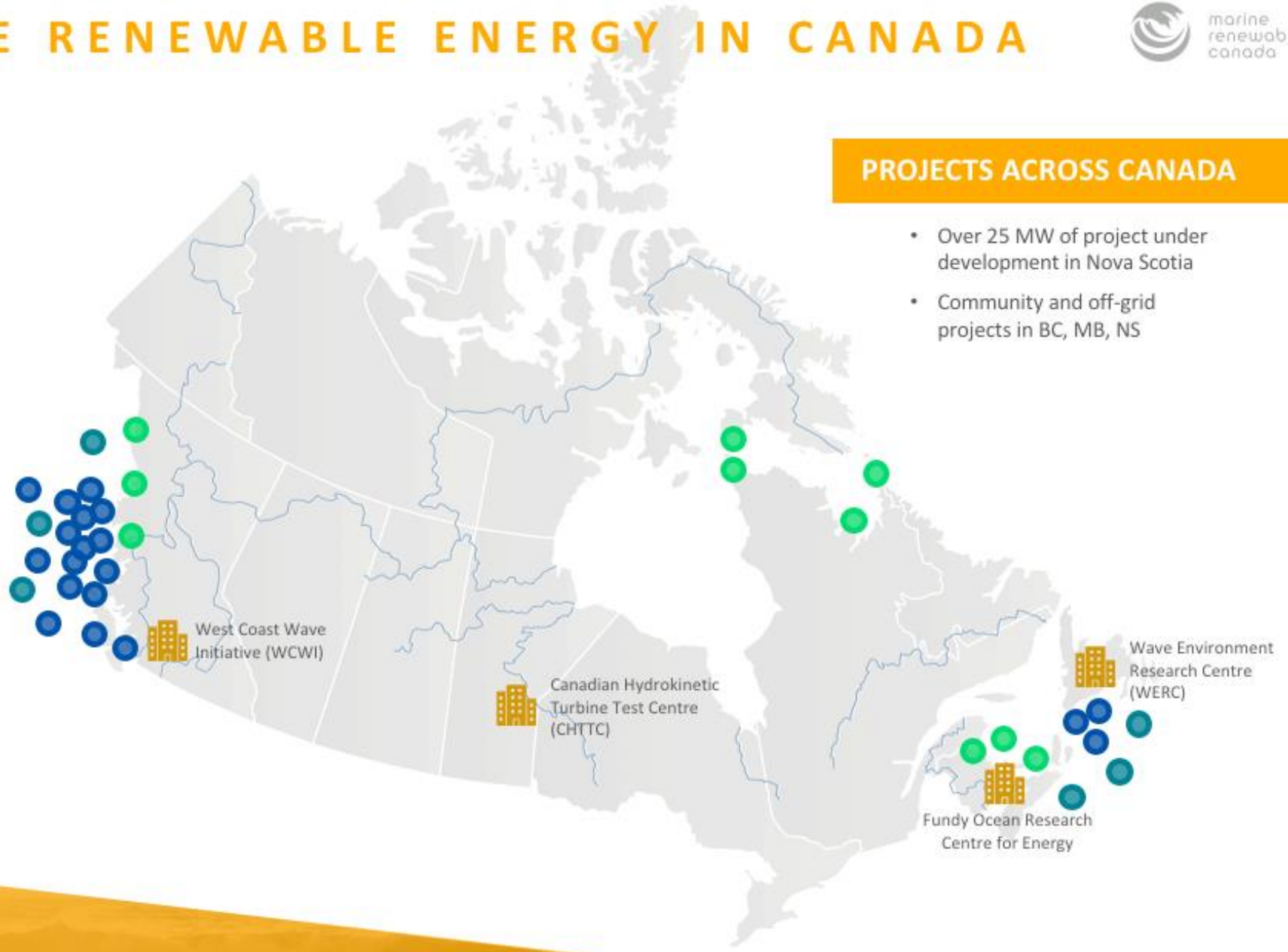
marine renewables canada

LEGEND

- Wave Energy Resources
- Tidal Energy Resources
- Offshore Wind Energy Resources
- River Current Energy Resources

GROWING KNOWLEDGE

- Over 100 research studies on Bay of Fundy tidal energy alone.
- Canadian universities and colleges engaged across the country.
- Ongoing information-sharing and collaboration with international researchers.



PROJECTS ACROSS CANADA

- Over 25 MW of project under development in Nova Scotia
- Community and off-grid projects in BC, MB, NS

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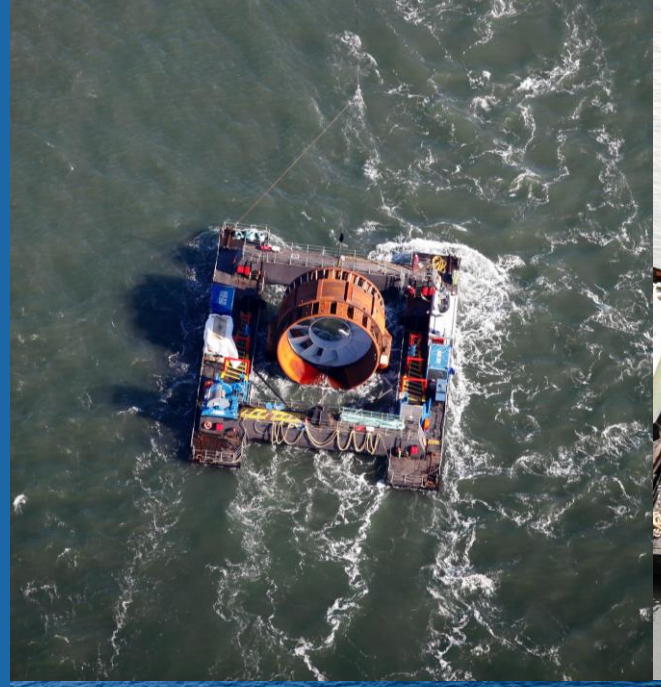
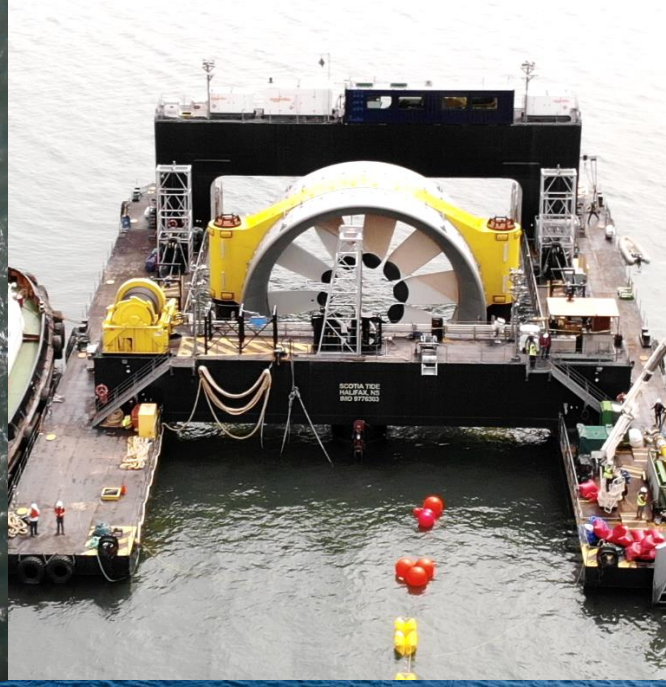
Tidal Projects in the Bay of Fundy

2009	NS Power deploys 1 MW OpenHydro device. Retrieved in 2010.
2016	Open Hydro turbine deployed. Big Moon Power tests their device in the Minas Passage.
2018	Open Hydro device deployed at the FORCE site
2019	Sustainable Marine Energy deployed in Grand Passage





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Why Nova Scotia?

The Need for Renewable Energy

- NS still fossil fuel dependent

The Bay of Fundy

- Highest tides in the world
- 160 billion tones of water twice a day

The Minas Passage

- 20 km/h peak current speed
- 7,500 MW **resource**

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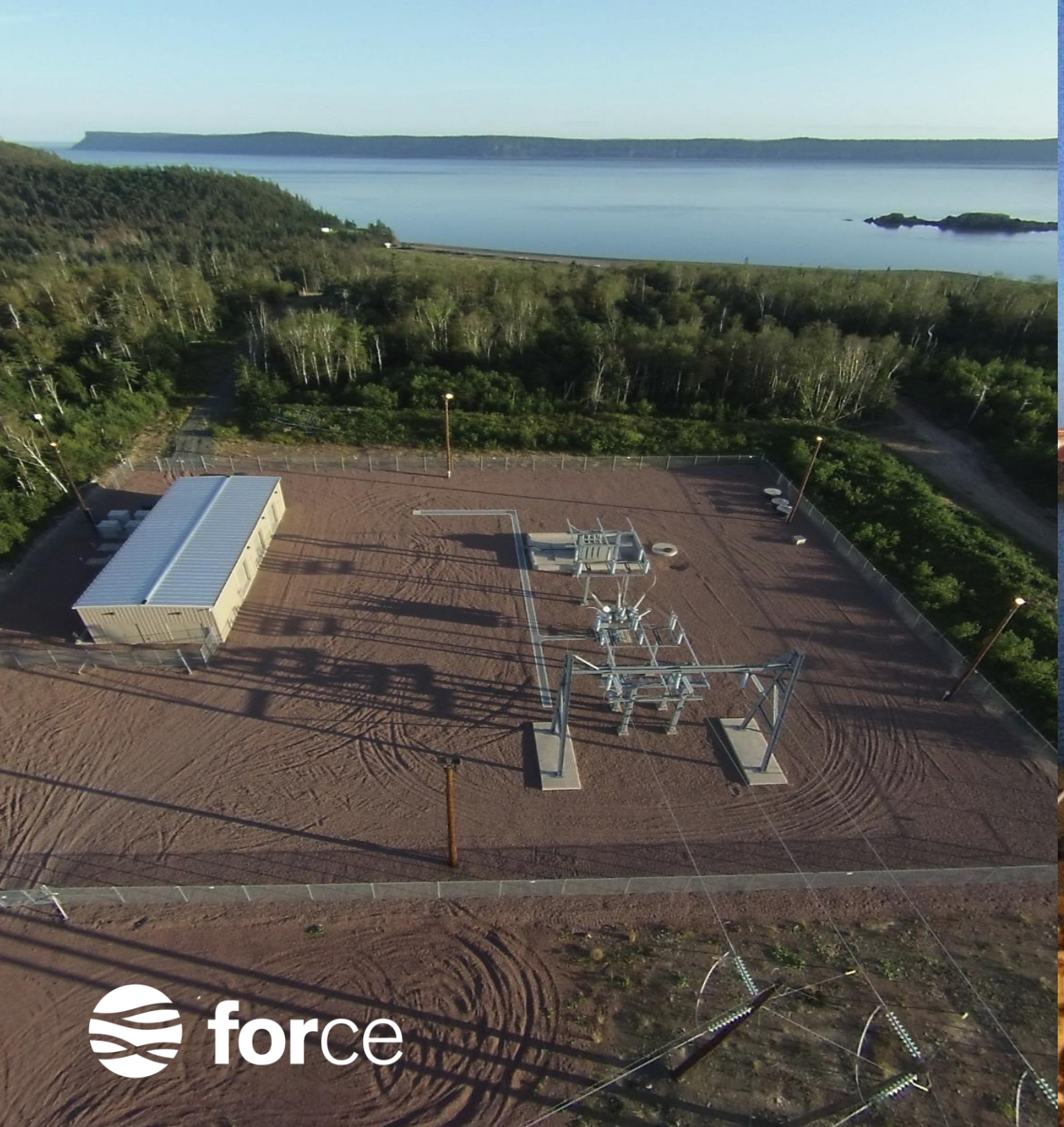
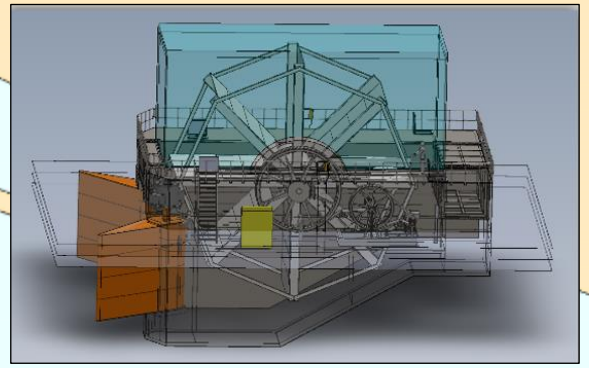


FORCE assets:

- 30MW interconnection facility
- 11KM SPC with dry mate connecto
- Visitor Center
- Permitted offshore lease area

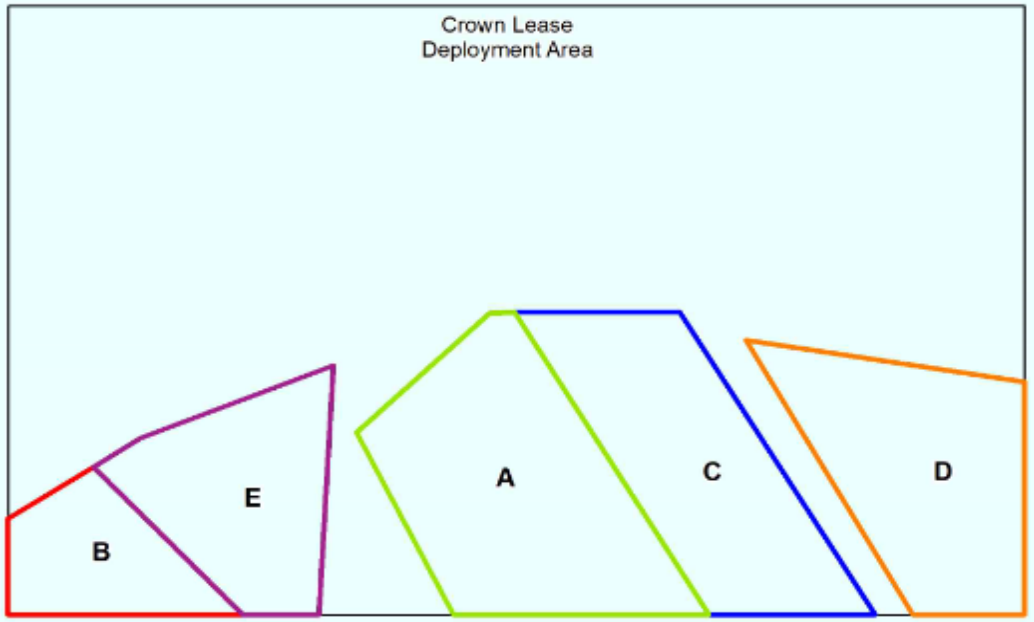
ANDRITZ 1.5 MW Turbines

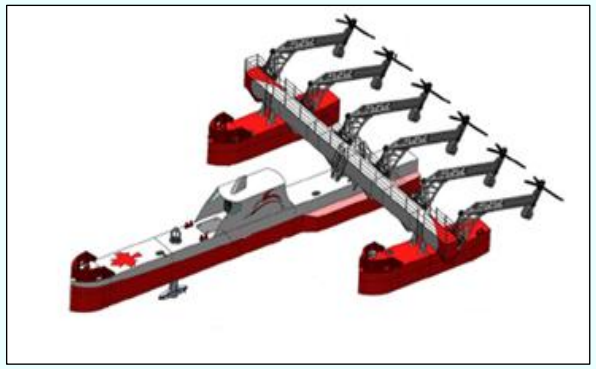
- Berth B – Rio Fundo
- Berth E - Haligonia



500 kW Kinetic Keel Gen3

- Berth D – BigMoon Power





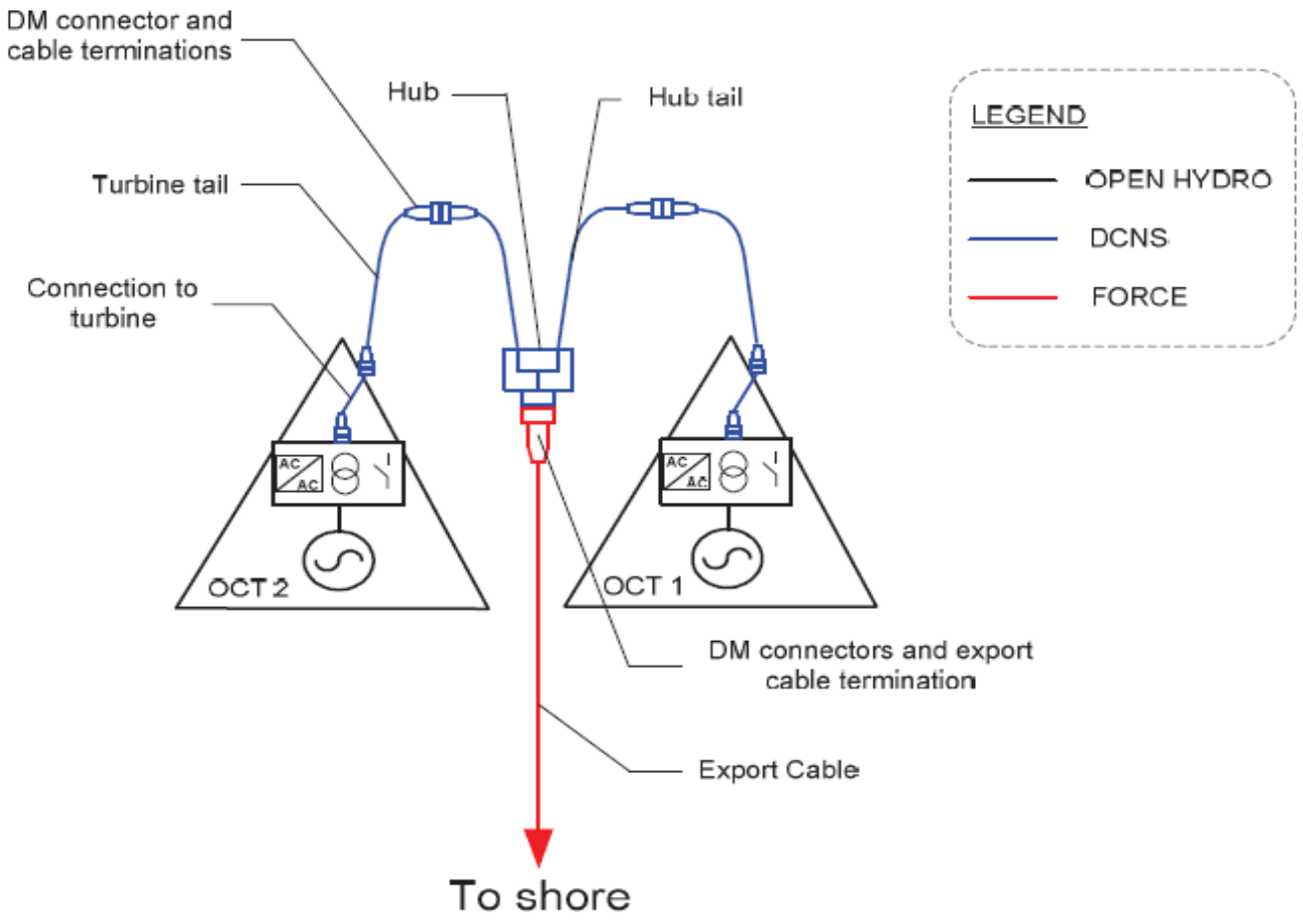
460 kW PLAT-I platform with SCHOTTEL turbines

- Berth A - Minas
- Berth C - SMEC

Cape Sharp Tidal Installation – Berth D

Cape Sharp Tidal's Project at FORCE

- **Dec 2015** Hub and twin tails installed
- **Nov 2016** OCT 2 installed at FORCE. First energy to the grid from a tidal project in Canada.
- **Jun 2017** OCT 2 removed
- **Jul 2018** OCT 1 installed. $1M decommissioning bond with Province
- **Jul 2018** OpenHydro placed in receivership. Majority owner of Cape Sharp Tidal.
- **SEP 2018** OHTC receives DIP in attempt to sell Canadian project. Liens placed on Scotia Tide and deployed turbine by creditors.
- **Nov 2018** Canadian project abandoned at FORCE
- **Mar 2019** Province initiates process to license berth with turbine removal as condition
- **Oct 2020** Berth D awarded to BigMoon Power. Local marine contractor acquires Scotia Tide



Nova Scotia

Idle turbine to stay put this winter, no word on who will pay to retrieve it

Courts in Canada, Ireland dealing with the fallout of OpenHydro filing for liquidation

Emma Davie · CBC News · Posted: Dec 13, 2018 6:00 AM AT | Last Updated: December 13, 2018

Who exactly will pay to bring up the turbine from the Minas Passage, and how much it will cost, is still unclear. (Cape Sharp Tidal)

Key Take Aways

- Was CST a unique situation for tidal energy projects?
- Liquidation process is chaos
- MRE projects are not commercially attractive…yet
- De-commission costs and scope were underestimated
- Abandoned project impacts public interests in many ways

Competing Interests

- Safeguard public interests by setting decommissioning bonds high enough to address full slate of costs and risks to remediate abandoned project.
- Costs and risks to get MRE projects in the water are already high. High security costs impact financing and ultimately the cost of the energy produced.

Mitigating Security Costs

- Expert 3rd party advice when estimating **FULL SCOPE** of decommissioning costs.
  - Costs go down if specialized assets not required
  - Availability of 3rd party expertise and equipment to conduct decommissioning
  - Consider costs beyond equipment removal
- Project structure and financing matters
  - Step in rights of lenders
  - Ability to sell project (Not necessarily technology)
- Regulations
  - Ability to step to cure safety or environmental risks if present
  - Can go a long way in addressing stakeholder concerns
- Regional Infrastructure for Decommissioning


THANK YOU
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