

# Marine Renewables Development



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**November 20, 2008**

*Wind, Wave & Tidal*



# The Site Development Process

Introduction

Approach

1. Site Identification
2. Resource Assessment
3. Consultation & Engagement
4. Project Feasibility & Preparations

Collaboration & Communication

Questions



# Introduction: Natural Power

A renewable energy consultancy that specialises in developing wind (on & offshore), wave and tidal energy sites for our clients.

Our technical and management services have supported over 15,000 MW of wind, wave and tidal projects across Europe, the US and Canada.



# Introduction: Our Team

We have teams of in-house specialists who deliver our services in partnership with local experts.

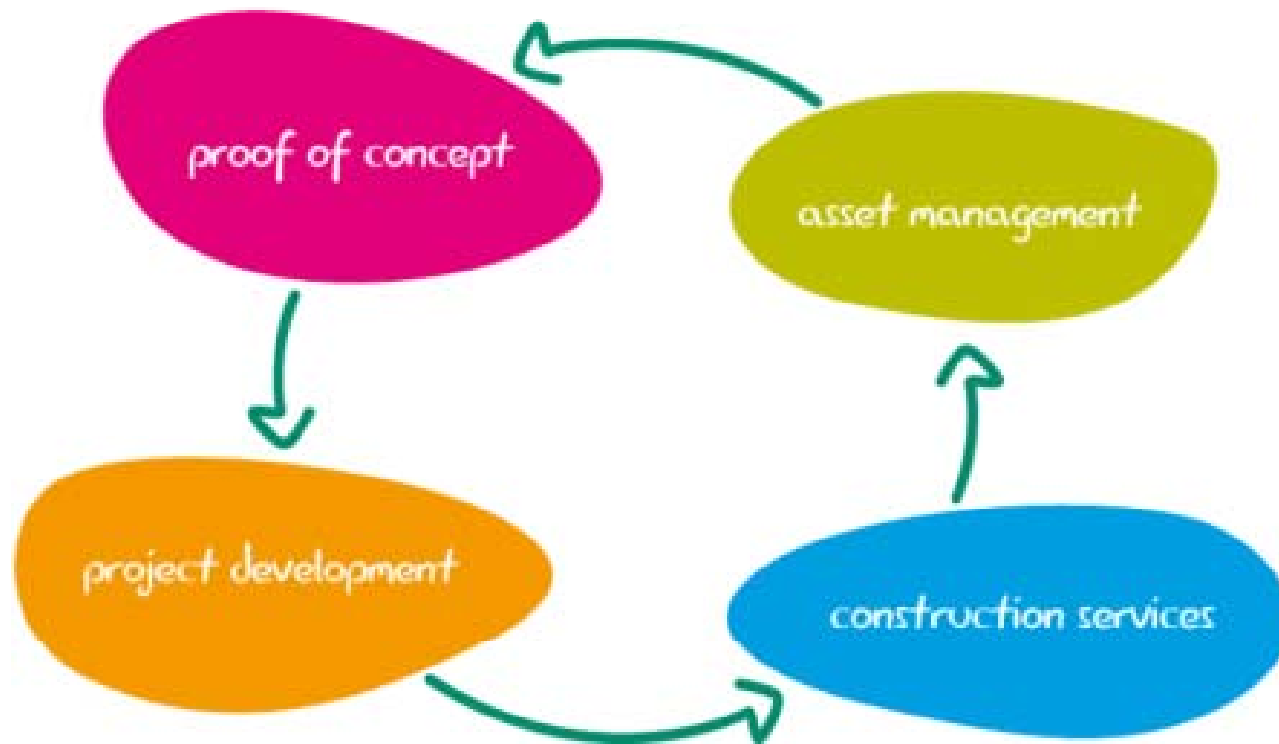
We collaborate with academic institutions, associations, and R&D houses to add value for the industry.

We have offices worldwide, including: Canada (Vancouver, Calgary), Scotland, Wales, France, Ireland, England, and Chile.

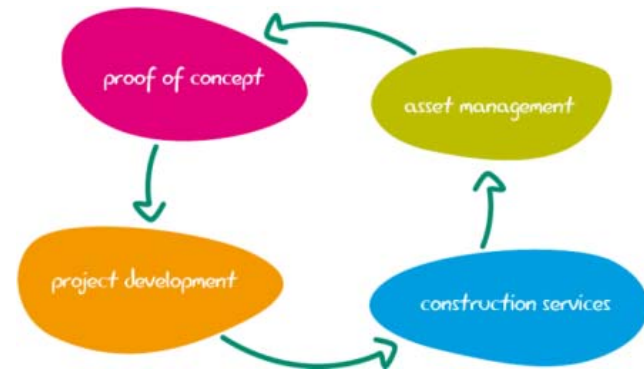


# Approach

We offer complete project lifecycle services and products for wind, wave and tidal energy projects. We are device neutral and use feedback loops to continually improve our processes.



## 2.1 Approach



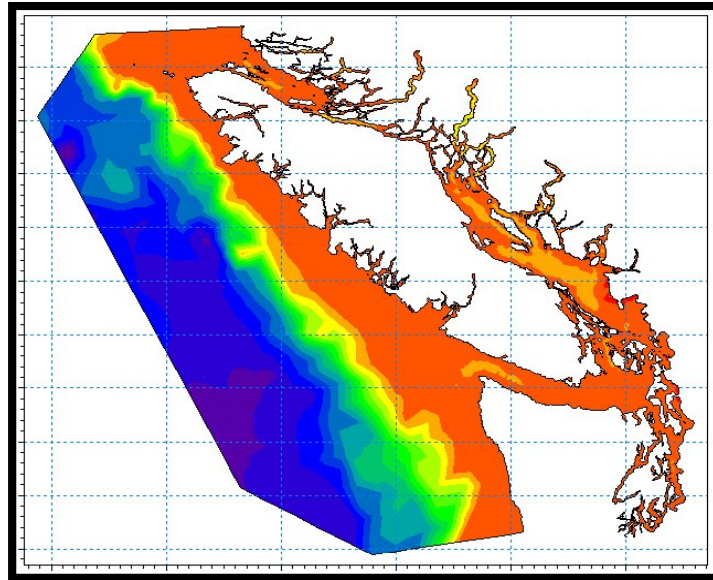
1. Leverage and adapt renewable energy experience gained in wind.
2. Device Neutral.
3. Service provider, with no asset ownership.
4. Design out risk.



# 1.1 Site Identification

## High level modeling

- Desk top modeling by GIS specialists and hydrodynamic modelers research sites and constraints based on client's objectives.



# 1.2 Site Identification

## Constraint Assessment:

- Resource
- Infrastructure
- Grid Access
- Environmental
- Socioeconomic
- Regulatory Regime
- Pricing Structure
- Politics



## 1.3 Site Identification

### Permitting

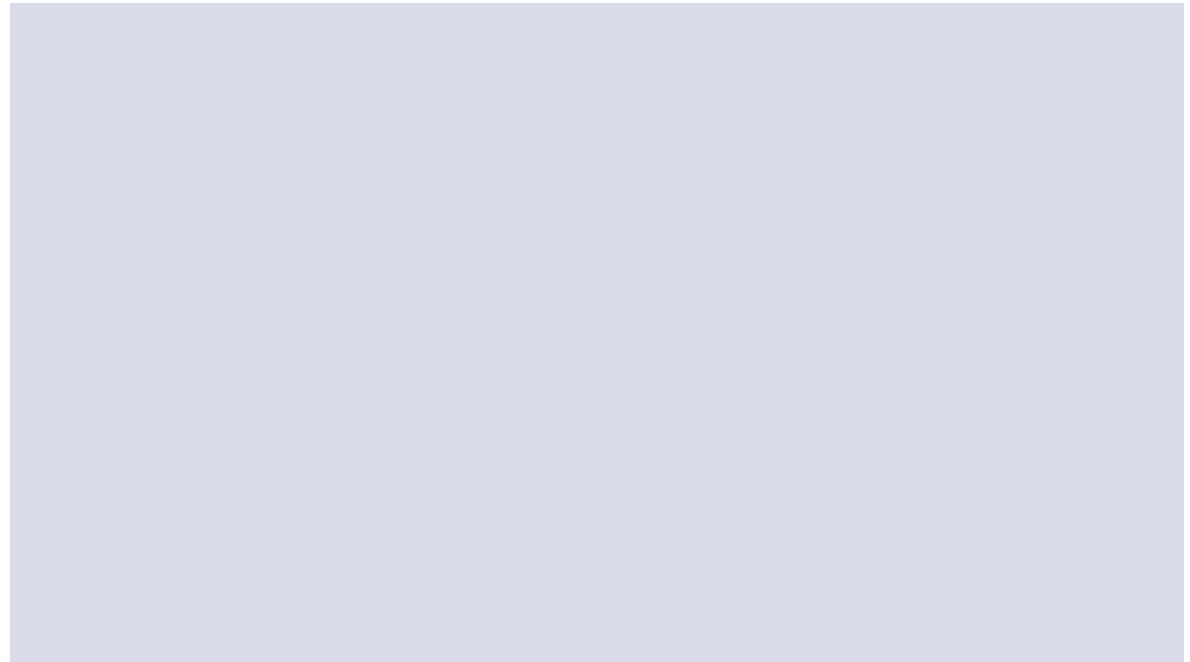
- Jurisdiction and community-specific
- BC Specific Example:
  - ILMB and FrontCounter BC
  - First Nations, Communities, Industry
  - Investigative Use Permits
  - Proof of Due Diligence



# 2.1 Resource Assessment

## Detailed Modeling

- In-house methodologies:
  - Industry best practice
  - Incorporate research from academia
  - MIKE21 software
  - Applied experience.
- Increasing site specialized modeling to determine the energy yield assessment and project potential
- Continue to narrow area of focus



## 2.2 Resource Assessment

### Monitoring Tidal

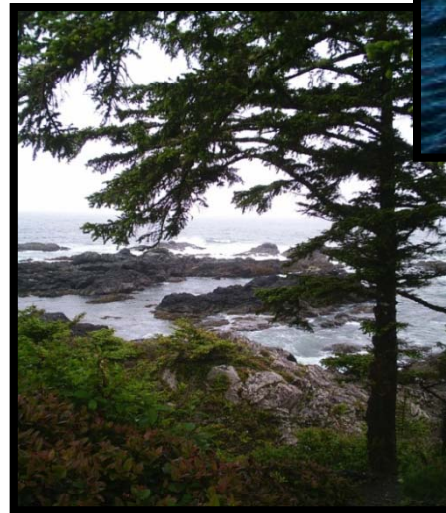
- 30 day deployments
  - 3 day intensives for turbulence
  - Seasonal deployment
  - Freshet influence assessment
- 
- Monitoring Permits
    - ILMB - Licence of Occupation
    - TC - Navigable Waters



## 2.3 Resource Assessment

### Monitoring Wave

- 2 year deployment minimum
- Regional collaboration
- Consultation with:
  - Transport Canada
  - BC Government
  - Fishermen
  - Communities

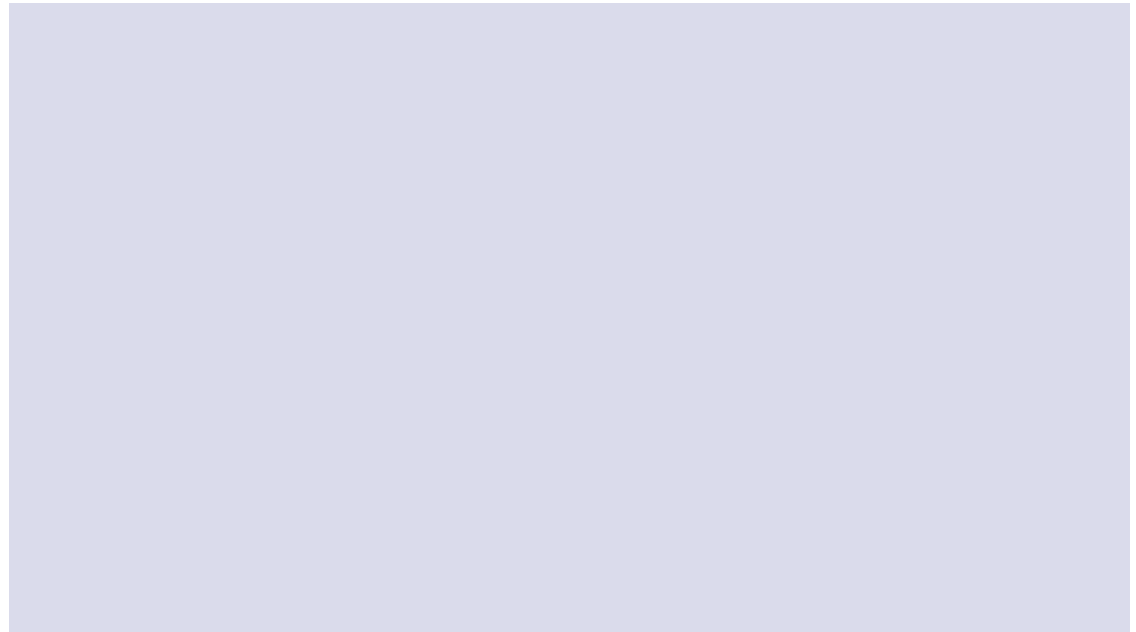


## 2.4 Resource Assessment



## 2.5 Resource Assessment

- **Feedback, validation, and revision of technical models**
  - Power outputs
  - Turbulence
  - Seasonal variation
  - Freshet influences



## 3.1 Consultation & Engagement

- Critical at all stages of the process
- Engage all relevant stakeholders
- Locals are experts on their region
- Keep them informed of project progress at all stages
- Provide realistic expectations to enable them to be supporters and partners



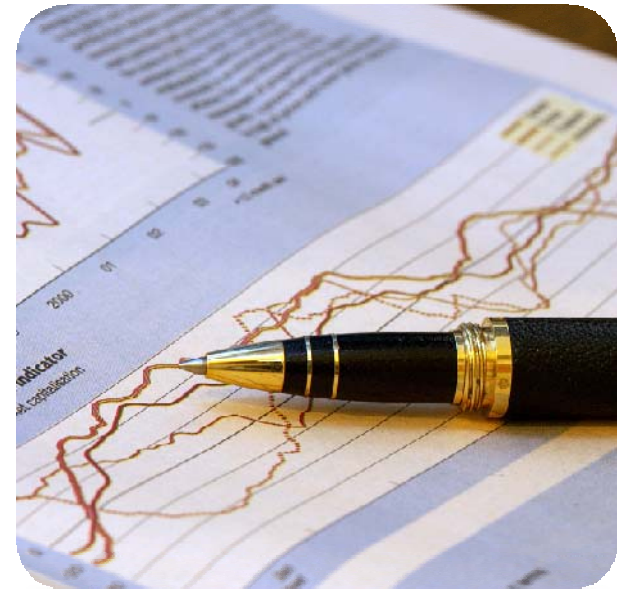
## 3.2 Consultation & Engagement

- At every stage of development work to continue building relationships and team capacity:
  - Service providers
  - Contractors
  - Supply Chain and Supplier relationships
  - Operational contacts
    - Coast Guard, Port Operations
    - Trawler Association
  - Health and Safety Expertise



## 4. Project Feasibility

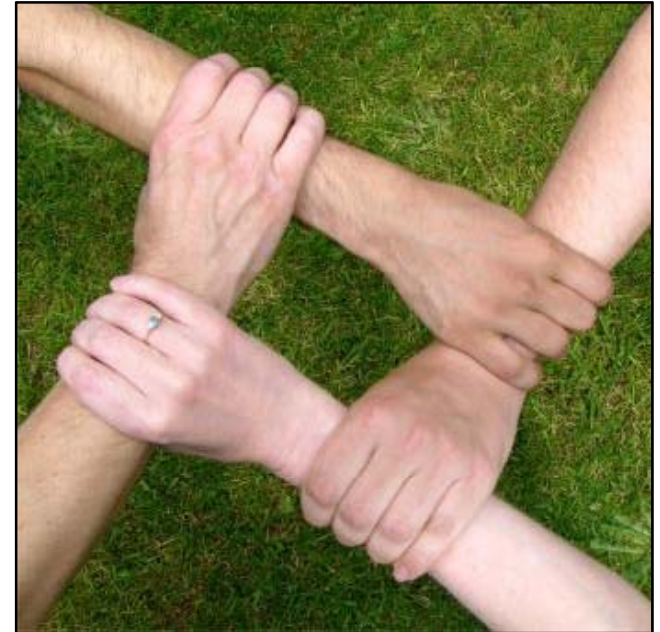
- Device Consideration
  - Device-specific power outputs
- Initial Financial Modeling
- Construction and Grid Planning
- Detailed project-specific studies



# Collaboration & Communication

## Areas for Collaboration

- Regional Studies:
  - Baseline strategic environmental assessment
  - Monitoring and sharing of raw data
- Consistent messaging for the industry
  - Clear expectations, timelines
  - Consistently communicated
- Coopetition





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**Thank you!**

