

Planning Challenges for Renewable Ocean Energy Projects

Perspectives from an Ocean Energy Developer

Presented by:
Stephanie Thornton, Principal
Sea Energy Associates LLC

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- Introduction to the Renewable Ocean Energy Industry
- Ocean Energy Project Development
- Project Development Perspective: Wave Energy Breakwater Project in Tillamook

DISCUSSION TOPICS

Imagine!

...what the situation today would be like if oil drilling did not exist in our coastal regions? And instead, there were a diverse mix of devices and installations in place harnessing ocean temperature gradients, current movement, wind blowing across the waves and wave movement all for the purpose of providing a clean, consistent source of electricity?

INTRODUCTION

RENEWABLE OCEAN ENERGY or otherwise referred to as MARINE HYDROKINETIC ENERGY

- Sector includes: ocean, wind, current, thermal, tidal and stream
- Marine hydrokinetic power (excluding ocean thermal) could provide 23 GW by 2025 and 100 GW by 2050 (*Electric Power Research Institute, EPRI*)
(by comparison 51 GW = 34 coal-fired plants)

THE NEXT HOT RENEWABLE ENERGY SECTOR

Oscillating
Water
Column



Tidal



Attenuator



Overtopping

Offshore Wind



**HOW IS OCEAN POWER TURNED
INTO KILLOWATT HOURS?**



Point
Absorber
*Coos Bay,
Reedsport &
Newport*

Offshore
Wind
Tillamook



Fixed Structure Energy
Generator
Tillamook & Reedsport



Hydro-electric
Wave Energy
Converter
Location TBD



PROPOSED TECHNOLOGIES IN OREGON

Ocean Renewable Energy Coalition (OREC)

- U.S. ocean renewable energy trade association in Washington D.C.

Oregon Wave Energy Trust (OWET)

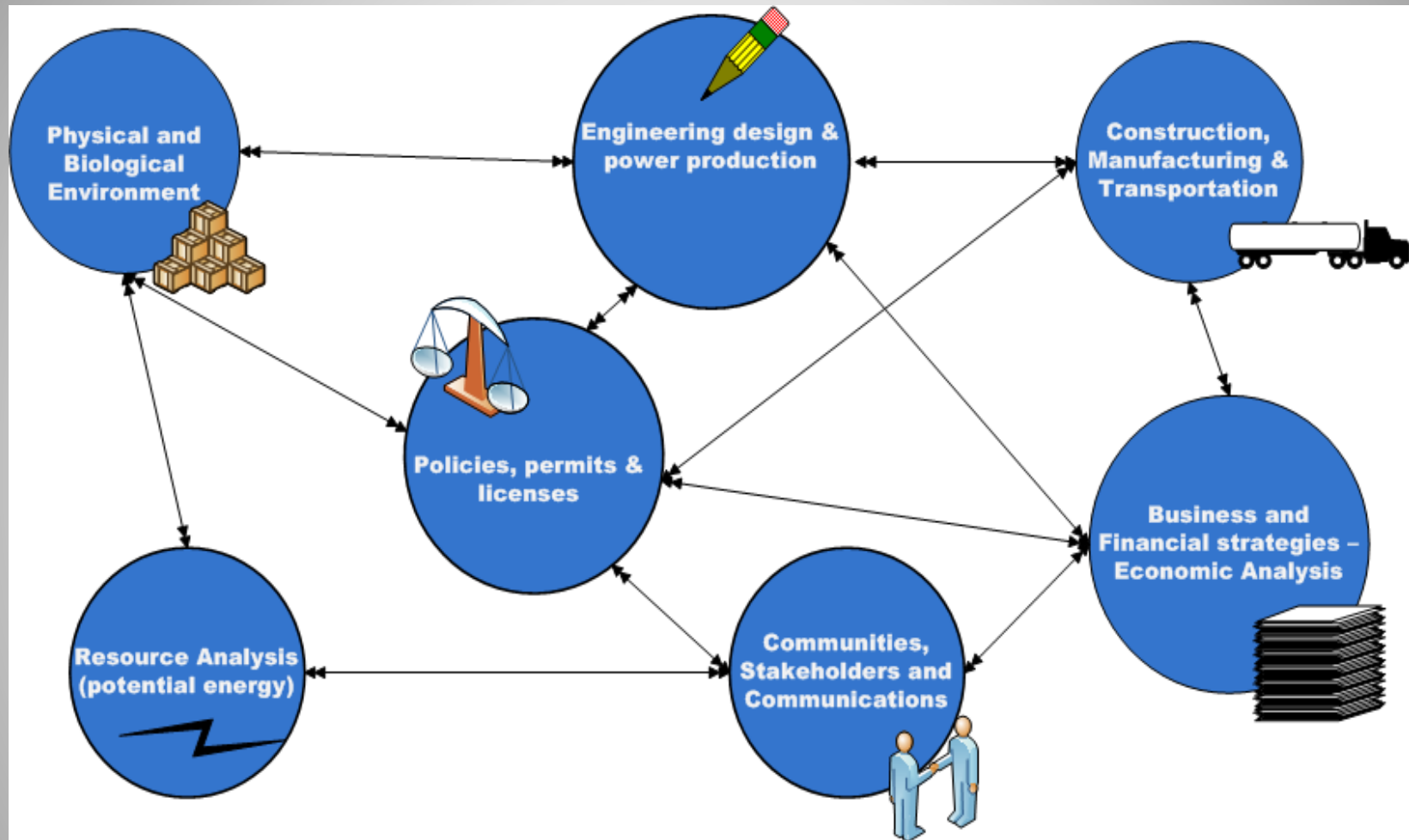
- Wave energy development association in Oregon

Ocean Renewable Energy Group (OREG)

- Canada's renewable ocean energy sector development association

OCEAN ENERGY ORGANIZATIONS

Developing Ocean Energy Projects

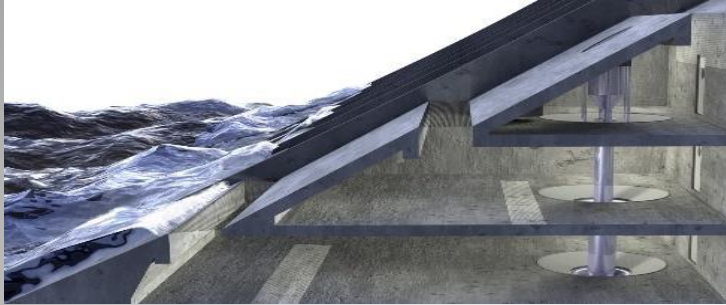


Ocean Energy Project Development

Project Development Perspective



Tillamook Wave Energy Project



- WAVEenergy AS – **ocean energy company** from Norway
- **Technology supplier** of fixed wave energy generating structures
- Installation based on the **overtopping principal**
- 2 projects currently in development –
Demonstration project in Norway &
Commercial scale project in Denmark



Conceptual illustration of a commercial scale installation



Port of Garibaldi
North Jetty

PROPOSED TILLAMOOK WAVE ENERGY FEASIBILITY STUDY

- International company doing business in US
- Patents (technology, structure, etc.)
- Business arrangements (operating models)
- Tax credits & incentives
- Legal intermediary & advisor

Business Management

- State regulatory authorities
- Federal regulatory authorities
- Legal relationship between the Army Corp of Engineers and private developer
- Resolving overlapping authorities

Jurisdictional Management

Licensing and Permitting

- Understanding requirements & advising on best approach
- Sequencing
- Managing process & communications with agencies

Communities

- Organizational authorities and/or responsibilities
- Input to permit and license applications (public processes)
- Responding to data confidentiality
- Land-use issues related to infrastructure support

POLICY, LEGAL AND REGULATORY ISSUES FOR PROPOSED TILLAMOOK PROJECT

*** This is not a complete list of issues*

For more information:

Stephanie Thornton, Sea Energy Associates LLC:

stephanie@rt-global.com

503-481-5949

WAVEenergy AS (Norway):

www.waveenergy.no

Oregon Wave Energy Trust (OWET):

www.oregonwave.org

Ocean Renewable Energy Coalition (OREC):

www.oceanrenewable.com

Ocean Renewable Energy Group (OREG):

www.oreg.ca