



Wave Energy Development in Oregon

Issues & Limitations, Preferred Practices & Policy Considerations

Prepared by
Therese Hampton, Pacific Energy Ventures
On behalf of Oregon Wave Energy Trust

September 2009

This work was funded by the Oregon Wave Energy Trust (OWET). OWET was funded in part with Oregon State Lottery Funds administered by the Oregon Business Development Department. It is one of six Oregon Innovation Council initiatives supporting job creation and long-term economic growth.

Oregon Wave Energy Trust (OWET) is a nonprofit public-private partnership funded by the Oregon Innovation Council. Its mission is to support the responsible development of wave energy in Oregon. OWET emphasizes an inclusive, collaborative model to ensure that Oregon maintains its competitive advantage and maximizes the economic development and environmental potential of this emerging industry. Our work includes stakeholder outreach and education, policy development, environmental assessment, applied research and market development.

This study was commissioned by Oregon Wave Energy Trust. Oregon Wave Energy Trust is funded by the Oregon Economic and Development Department through the Oregon Innovation Council to support innovation, job creation and retention and economic growth.

This document was prepared by Pacific Energy Ventures on behalf of the Oregon Wave Energy Trust. For information about this project, please contact Therese Hampton at Pacific Energy Ventures:

Phone: (360) 210-7325

Email: thampton@peventuresllc.com



The Oregon Wave Energy Trust – with members from fishing and environmental groups, industry and government – is a nonprofit public-private partnership funded by the *Oregon Innovation Council* in 2007. Its mission is to serve as a connector for all stakeholders involved in wave energy project development – from early stage community engagement to final deployment and energy generation – positioning Oregon as the North America leader in this nascent industry and delivering its full economic and environmental potential for the state. OWET's goal is to have ocean wave energy producing 2 megawatts of power – the equivalent of about 800 homes – by 2010 and 500 megawatts of power by 2025. www.oregonwave.org



Pacific Energy Ventures is a consulting and business development firm specializing in strategic marketing, project management, governmental affairs, and policy in the renewable energy sector. With extensive experience in all aspects of project management, our firm has the advantage of a multi-dimensional perspective on the industry. Pacific Energy Ventures provides unique insights into the challenges of balancing environmental and socioeconomic concerns with emerging business objectives. We excel at navigating through complex markets and identifying sound opportunities in a rapidly evolving business climate. www.peventuresllc.com

Table of Contents

Focus Area 1: Project Planning	3
Focus Area 2: Current Regulatory Framework	5
Focus Area 3: Environmental Effects	8
Focus Area 4: Socioeconomic Effects	11
Appendix A: List of Issues & Limitations	13
Appendix B: List of Preferred Practices	14
Appendix C: List of Policy Recommendations	16
Appendix D: Background Information	18

Overview & Introduction

Project Overview

As the emerging ocean energy industry progresses towards commercialization, the need for a regulatory process that sufficiently addresses key interests has become increasingly apparent. As part of the organization's efforts to foster responsible development in this emerging industry, OWET is sponsoring a program to educate and engage with stakeholders about existing and proposed regulatory processes. In July 2008, OWET contracted Pacific Energy Ventures (PEV) to implement the project *Guidelines for Wave Energy Development in Oregon*. The purpose of this project is to provide analysis that 1) documents stakeholders' needs and interests and 2) offers options to maximize the effectiveness of the regulatory framework. The project has four main focus areas:

Focus Area 1- **Project Planning**

Focus Area 3- **Environmental Effects**

Focus Area 2- **Regulatory Framework**

Focus Area 4- **Socioeconomic Effects**

Approach

In executing this project, PEV is utilizing an iterative, collaborative process through which the team engages with stakeholders to identify key issues and limitations, document preferred practices, and formulate policy recommendations. The approach has four principle components:

1. *Summarize current information about the existing regulatory framework.* The team first evaluated existing regulatory framework and created a handbook that explains each process, "State and Federal Laws Applicable to Wave Energy Development in Oregon." This handbook is available on OWET's website (<http://oregonwave.org/index.php/projects/owetprojects.html>).
2. *Initiate stakeholder engagement to solicit input on current development practices and regulatory processes.* To initiate stakeholder engagement, the team drafted a preliminary set of issues and limitations, preferred practices, and policy recommendations for each of the project focus areas (Project Planning, Regulatory Framework, Environmental Effects, and Socioeconomic Effects). Beginning in March 2009 and continuing through June 2009, comments were collected through written comment, one-on-one conversations, and small group meetings.
3. *Develop and capture stakeholder consensus about preferred development practices.* After obtaining stakeholder input on the preliminary draft, the team then developed this revised draft. The team will solicit stakeholder review and comment on this second draft during July and August of 2009.
4. *Develop and distribute a final report.* After collecting input on the second draft, the team will again apply stakeholder feedback and develop a final version. The final version will reflect the stakeholders' assessment and evaluation of issues and limitations, preferred practices, and policy recommendations.

Upon project completion, OWET will share the findings and results with stakeholders to utilize in supporting the responsible growth of Oregon's wave energy industry.

Document Organization

The issues identified by stakeholders are grouped within the focus areas under which they fall (Project Planning, Regulatory Framework, Environmental Effects, and Socioeconomic Effects). Each listed issue is followed by an explanation of the specific limitations surrounding the issue. After the explanation section, the preferred practices and policy recommendations associated with the issue are listed.

Focus Area 1: Project Planning- Stakeholder Outreach & Site Selection

Issues & Limitations

1.1 Stakeholders want to be engaged with developers and regulators prior to site selection.

- A Preliminary Permit (for projects in state waters) or Hydrokinetic Lease (for projects on the OCS) provides developer with site priority while they evaluate the site, determines project feasibility, and, potentially, develop a license application. While a Preliminary Permit is not required to file a license application, most developers need the site priority it provides to protect their investment in assessing and studying the site. For projects on the OCS, a Hydrokinetic Lease performs the function of site priority that a Preliminary Permit provides in state waters; further, developers must obtain a Hydrokinetic Lease from MMS before FERC will issue a license application. These circumstances incentivize developers to secure site priority before engaging with stakeholders about site selection.
- Given the early-stage of wave energy technology and the uncertainty of its effects on the ecological and human environment, resource agencies and stakeholders would like to be involved in the earliest stages of project siting and planning. These stakeholders are interested in identifying and discussing potential concerns about proposed projects early in the planning stage- prior to site selection. There is concern that if issues are not identified early, they either won't be addressed or may become too difficult and costly to address.
- Formal consultation is not required to file a Preliminary Permit application; therefore, consultation prior to applying for a Preliminary Permit must be initiated and implemented by the applicant. Because wave energy is such a new industry, many developers do not have much experience with these processes and are not aware of stakeholder’s desire for this type of early consultation.

Preferred Practices	Policy Considerations
<ul style="list-style-type: none">➤ Project developer holds meetings with interested parties, including resource and regulatory agencies (federal, state and local) and local communities, to share the project concept and gather input on the development approach prior to submitting applications for Preliminary Permits or OCS Leases.➤ After submitting initial applications, project developer continues stakeholder outreach and engagement to share information and collect input on the project design and approach.➤ Project developer begins early planning and development of an approach to settlement discussions.➤ Project developer holds regular public meetings about the project, the permitting process, and development timeline.	<ul style="list-style-type: none">➤ Provide additional time (more than the current one-year timeframe) within the FERC licensing process to develop and submit the Notice of Intent/Preliminary Application Document (NOI/PAD). Additional time will allow for more sufficient stakeholder engagement in project planning.➤ Modify the MMS lease award procedures to account for the project proponent’s level and approach to stakeholder engagement.

<ul style="list-style-type: none"> ➤ Enhance methods for notifying interested parties of applications for Preliminary Permits and Hydrokinetic Leases. ➤ Regulatory agencies create "Best Practices" guides to accompany application criteria checklists, and include pre-filing consultation in the best practice guidelines. 	
--	--

1.2 *Current management plans and policies do not provide for well-informed site selection.*

- Most agencies and stakeholders believe that project location can minimize the magnitude of effects on the ecological and human environment. For that reason, resource agencies and stakeholders advocate for site evaluation prior to any site-specific authorizations.
- Current regulatory processes evaluate site location on a case-by-case basis.
- Stakeholders and agencies want the opportunity to provide input on the existing conditions of the proposed site and the project's potential effects to that area prior to any site priority authorization being applied for or granted.

<p>Preferred Practices</p> <ul style="list-style-type: none"> ➤ As a first step in project development, project developers engage with agencies and stakeholders to discuss and evaluate the environmental factors, current uses and statewide planning relative to specific project locations. ➤ Project developers seek and utilize stakeholder input to determine the appropriateness of a proposed site and offer alternatives, if appropriate, before developing a preliminary application document. ➤ Regulatory agencies create "Best Practices" guides to accompany application criteria checklists, and include pre-filing consultation in the best practice guidelines. ➤ State and federal agencies inform developers of existing information about potential sites and any plans for determining appropriate sites in a particular area. 	<p>Policy Considerations</p> <ul style="list-style-type: none"> ➤ Amend the Oregon Territorial Sea Plan (TSP) to include spatially explicit information about existing uses and ecologically sensitive areas, so that all parties can be well-informed during site selection.
---	---

1.3 *Because these activities are so new, many parties are unfamiliar with the regulatory processes, so opportunities for engagement during the licensing process are often missed. A lack of mutual understanding and effective communication during the licensing process are barriers to effective stakeholder engagement.*

- For instance, it is a common misconception that issuance of a preliminary permit authorizes construction activities; however, a preliminary permit simply gives permission to study the site and priority to submit a license application for development on the site.
- Although preliminary permits are noticed for comment, many regulatory and resource agencies are not aware of new preliminary permit applications. This can result in missed opportunities to comment or engage at the appropriate time.

Preferred Practices	Policy Considerations
<ul style="list-style-type: none">➤ Project developers, FERC, MMS, and other federal and state agencies share information about the permitting processes with stakeholders and each other, with a focus on identifying key decisions points and opportunities for stakeholder involvement.➤ Enhance methods for notifying interested parties of applications for Preliminary Permits and Hydrokinetic Leases.	<ul style="list-style-type: none">➤ Pursue additional ways to more accurately describe and communicate the function and limitations of a FERC preliminary permit.

Focus Area 2: Current Regulatory Requirements

As the wave energy industry and the associated technologies develop, project development will progress along a continuum from testing to full scale commercialization. There are four different phases of development that the regulatory processes need to address, each of which varies in size and duration.

Research & Development: Oftentimes, a small-scale version of the technology is put into the ocean environment for a short period of time (typically less than a year). These Research and Development (R&D) stage projects do not supply power to the grid.

Pilot Scale (grid connected): This phase involves installing a full scale version of the technology device in the ocean with the anticipation that it is the first stage of a larger scale project. Projects at this phase may be grid connected, but will most likely produce small amounts of power.

Small scale commercial: This involves deploying multiple units of the full scale technology devices. Projects in this phase are grid- connected and produce small but marketable amounts of power.

Large scale commercial: This involves deploying several units of the full scale technology devices. These projects are grid- connected and produce significant amounts of marketable power.

Issues & Limitations

2.1 *Current federal, state and local regulatory processes are not conducive to a phased or incremental development approach.*

- Because wave energy conversion devices are new technologies, agencies, stakeholders and developers have a shared interest in starting with small projects to learn about effectiveness and effects first.
- The current regulatory framework does not provide for a seamless transition through each phase of development, but instead requires separate licensing and permitting process for each stage.
- The current framework may be more comprehensive than necessary for the R&D and Pilot Scale phases, and does not provide for simple transition to the next phase of development.
- FERC has established a pilot process to provide a short-term license for some small scale projects. Agencies and stakeholders support the small scale and shorter timeframe because it minimizes risk. However, the approach does not provide a way to transition from a pilot-scale to a small scale commercial project nor provide for adaptive management.
- State regulations do not offer alternative permitting process for pilot projects.

Preferred Practice

- Parties engage to collectively develop an effective adaptive management approach to support phased development.
- Parties design studies for pilot or small scale projects so that they inform the next phase of project development.
- Develop a standard adaptive management approach that meets all parties' needs for study, evaluation, and decision making for phased development.
- Parties include a plan for project removal as an alternative if there are significant unforeseen effects.
- Develop a central data base on ocean resources, study results, etc. This will make the regulatory process easier for future projects.

Policy Considerations

- Modify current federal and state permitting/licensing processes to better support phased development.
- Develop a coordinated approach to federal and state permitting for R&D and pilot scale projects.
- Adopt a common set of performance standards that can be used to determine if a project may expand or should contract, to the extent possible.
- Establish federal or state funded test sites to evaluate R&D and pilot scale projects.

2.2 *The absence of a comprehensive plan for ocean uses makes it difficult for developers, agencies and stakeholders to determine the most appropriate areas for project siting.*

- The FERC and MMS processes evaluate benefits and effects of proposed development on a case-by-case basis; as a result the current regulatory framework does not provide for a comprehensive evaluation of where, when and how much development is appropriate.
- The Territorial Sea Plan Amendment Process will address this issue at the state level in Oregon; however, the cumulative effects of existing and future uses in state and federal waters off the West Coast still needs to be addressed.

- The MOU between FERC and the State of Oregon requires FERC to consider statewide planning prior to issuing a preliminary permit.
- It is not clear yet how MMS will interface with the state and the Territorial Sea Plan guidance.

Preferred Practices	Policy Considerations
<ul style="list-style-type: none"> ➤ Utilize marine spatial planning, on both the state and federal level, to effectively site projects to minimize the individual and cumulative effects of existing and future ocean uses. ➤ Federal agencies consider statewide planning prior to issuing authorizations, and coordinate all ocean management activities. 	<ul style="list-style-type: none"> ➤ Develop and implement a coordinated approach to spatial planning, studying and monitoring, and permitting ocean activities with relevant state and federal agencies.

2.3 *The regulatory framework for ocean activities beyond state waters is still fairly uncertain and complex.*

- Although the jurisdictional responsibilities for hydrokinetic projects on the OCS have been clarified, it is still unclear how the FERC and MMS regulatory programs will interface.
- Although FERC and MMS recently issued *Guidance on Regulation of Hydrokinetic Energy Projects on the OCS*, it remains unclear exactly how the procedures and schedules for consultation, environmental review, and information filing will be implemented and how they will be coordinated, if at all.
- FERC and MMS have not provided a thorough explanation of how NEPA reviews required for their respective authorization processes will interface.
- MMS has not specified how it will account for Oregon's state planning policies in its implementation of the new rule, *Renewable Energy and Alternative Uses of Existing Facilities on the OCS*.

Preferred Practices	Policy Considerations
<ul style="list-style-type: none"> ➤ Federal agencies consider statewide planning policies and goals prior to issuing authorizations. ➤ As projects progress, continue to coordinate FERC and MMS regulatory programs and provide guidelines with detailed explanation of how the processes interface relative to procedures and schedules for consultation, environmental review, information filing, etc. 	<ul style="list-style-type: none"> ➤ Pursue an MOA between the State of Oregon and MMS to identify how MMS will interface with and consider state planning in its process. ➤ FERC and MMS synchronize their regulatory programs so that the time and resources required by all parties involved are utilized as effectively and efficiently as possible to provide for responsible and balanced management of ocean activities.

Focus Area 3: Environmental Effects

The assessment and evaluation of environmental effects relies on the following categories of information:

Baseline: Description of the existing marine physical, geological, chemical and biological processes and conditions at time and space scales relevant to the proposed development and; including habitat types, resource assemblages and usage prior to installation of any ocean energy device. Because environmental conditions are changing and because no year is “typical”, federal and state resource agencies generally want at least two years of baseline information prior to installing a device.

Project Effects Studies: Targeted studies to evaluate specific effects associated with the installation and/or operation of a device. The studies are designed to evaluate whether and to what extent the installation and/or operation of a device has an effect on the existing environment and may be required in cases of high uncertainty or high risk. They may be conducted in laboratories or in situ (at the site).

Monitoring: Monitoring studies are used to complement the baseline and project effects studies, and to maintain an ongoing, routine evaluation of key environmental conditions throughout the construction and operation of a device or facility.

Cumulative Effects: Conceptual models and/or studies designed to either predict or assess one or more of the following: effects of multiple devices in the environment; effects over a long period of time; and the collective effects of several different ocean activities (e.g., ocean energy, commercial shipping, commercial and recreational fishing). Cumulative effects assessments are critical to the success of ecosystem-based management efforts.

Issues & Limitations

3.1 *Lack of existing baseline information and effect studies associated with wave energy devices.*

- There is insufficient information about the existing resources and conditions to effectively predict or measure effects. Further, there are limited national or international examples to draw from.
- Oftentimes, regulatory processes can rely on review of information from similar, existing projects to address the effects of a proposed facility. Ocean energy facilities are new and, therefore, existing project information is both limited and/or not relevant to the Pacific Northwest.
- Designing and performing studies to gather baseline data and evaluate potential effects requires considerable funding. Given the nascent nature of the emerging wave energy industry, the costs of these studies can place a significant financial burden on developers that may not be sustainable.

Preferred Practice	Policy Considerations
<ul style="list-style-type: none">➤ Developers, agencies and stakeholders collaboratively develop an adaptive management approach that meets all parties needs and provides for informed decision-making.	<ul style="list-style-type: none">➤ Allocate federal and state funding for baseline studies in those areas that have a high likelihood of being developed.➤ Allocate federal and state funding for effect studies that are of broad application to be maintained in the public domain.

<ul style="list-style-type: none"> ➤ Identify baseline and effects studies whose results can be broadly applied and pursue public funding for these studies. ➤ Secure cost share, state and federal funding for studies, where appropriate. ➤ Encourage collaboration among developers and regulatory agencies to establish viable options for collecting and using baseline information. 	For example: acoustic effects, marine mammal entanglement.
--	--

3.2 *Lack of defined cumulative effects studies for existing and proposed ocean uses.*

- There are issues or effects that may not materialize from a single ocean energy project. However, the effect of multiple projects, in conjunction with existing ocean activities, could have cumulative effects that should be avoided, minimized or mitigated.
- Given that these issues are not the result of any single ocean use, it is unclear how research and analysis of these issues should be funded. Further, it is unclear when research on these issues should commence.
- OWET has funded a project to develop a cumulative effects framework that can be used to identify and evaluate the range of effects that may occur with wave energy development. However, it remains unclear as to how the actual studies will be conducted or funded.

Preferred Practice	Policy Considerations
<ul style="list-style-type: none"> ➤ States and research organizations define the key cumulative effects issues and develop a study approach. ➤ Developers, stakeholders, agencies, and research institutions create and utilize a cost-share program to fund cumulative effects studies that are relevant and useful to all parties. 	<ul style="list-style-type: none"> ➤ Dedicate Federal and state funds to cumulative effects studies. ➤ Establish an MOA among developers, relevant government agencies (state and federal) to allocate funding for agreed upon cumulative effects studies.

3.3 *The ocean environment can be difficult to effectively evaluate and monitor effects.*

- The power and force of the marine environment can make it difficult to install and maintain monitoring systems; further, the harsh conditions could compromise the reliability of the data collected.
- The inability to have constant human presence makes it difficult to use some traditional monitoring methods.
- The vast and complex intricacies of ocean processes (e.g., 20-year ocean cycles, pacific decadal oscillation, global warming, commercial and recreational activities) make it difficult to discern cause and effect.

Preferred Practice	Policy Considerations
<ul style="list-style-type: none"> ➤ For initial study and monitoring activities, parties agree on studies and standards that acknowledge the limited information and, therefore, uncertainty of potential effects. ➤ Apply the information and "lessons learned" in the initial study and monitoring stage to improve on study methods and design as information is collected. 	<ul style="list-style-type: none"> ➤ Establish information requirements, during the initial stage of a project's development, that acknowledge the limited information and uncertainty of potential effects.

3.4 *Standard study and monitoring protocols have not been established for wave energy development in the U.S.*

- There are no established study methods for many potential effect issues.
- It is difficult to design studies for some potential effects (e.g., evaluating effects to salmon and crab).
- As new information is collected and becomes available for others to use, it is important to use comparable study and monitoring protocols so that the information can be used in the evaluation and analysis of other proposed projects.

Preferred Practice	Policy Considerations
<ul style="list-style-type: none"> ➤ Collaboratively develop standard study and monitoring protocols. ➤ Project proponents use study and monitoring methods that are most consistent with existing research, to the extent possible. 	<ul style="list-style-type: none"> ➤ Allocate federal funds to establishing standard study and monitoring protocols that are consistent with the data needs for comprehensive ocean management.

3.5 *There is no existing infrastructure for storing and sharing study and monitoring data.*

- Although existing information relating to ocean energy activities is limited, information collected from weather buoys or for management of commercial fisheries may be applicable to this industry. However, it is not clear where that information resides and how to access it.
- Similarly, stakeholders, agencies, and developers may not be aware of or have access to relevant information within numerous research institutions and universities.
- As initial baseline, effect and monitoring studies are conducted, it would be helpful to make this information available to project developers, regulatory and resource agencies. Currently, methods and outlets for sharing this information are not in place.

Preferred Practice <ul style="list-style-type: none"> ➤ Individual agencies, organizations, and universities endeavor to identify a public site(s) that identifies and provides access to relevant ocean or study information. 	Policy Considerations <ul style="list-style-type: none"> ➤ Provide federal and state funding to develop a system and infrastructure for storing and sharing information.
--	--

Focus Area 4: Socioeconomic Effects

Issues & Limitations

- 4.1 *There is limited information and untested methodologies for evaluating the positive and negative effects of ocean renewable energy development on socioeconomic factors.*
- Although the value of some of the existing uses activities are well quantified and documented, the value of all existing uses in the near shore marine environment is uncertain.
 - Given this lack of existing information and the newness of the wave energy industry, it is difficult to gauge how wave energy projects will affect the commercial fishing industry and the overall quality of recreation activities like surfing and fishing.
 - Effects to socioeconomic factors like job and tourism are unknown. The wave energy industry will create jobs; however, the locations and durations of those jobs are not yet known.
 - Similarly, the effects on the commercial and recreational fishing industries are uncertain. It is expected that wave energy project areas will be no fishing zones, however, the overall effect on fishing resources and revenue generation is not yet known.
 - At this time, there are limited national or international examples to provide insight into potential effects.

Preferred Practice <ul style="list-style-type: none"> ➤ Collect and share existing information to establish more precise values of the existing fishing resources and industry revenues. ➤ In the absence of studies or information sources on this issue, estimate and evaluate potential effects through an objective process as part of settlement discussions. ➤ Track the values of fishing and recreational resources and revenues after project installation, compare it with the baseline values, and share the findings with state and local communities. 	Policy Considerations <ul style="list-style-type: none"> ➤ Fund educational/research institutions, public agencies and NGOs to develop a scientifically credible approach for gathering data and assessing the positive and negative socioeconomic effects of wave energy. ➤ Create legislation that provides incentives and support of educational/research institutions, developers, and agencies for collaboration in order to leverage existing study efforts.
--	---

4.2 *There is a lack of publicly available information about the location and value of the existing uses of the ocean.*

- Documented, reliable information about the value of existing resources and uses is necessary for a meaningful and useful evaluation of socio-economic effects.
- Currently, there is information about the overall value of commercial fishing, but limited spatially specific information. For example, the commercial seafood industry in Oregon has an estimated value of over \$100 million. The Oregon Dungeness Crab fishery is the most valuable 'single-species' fishery in Oregon with annual values ranging from \$5 million to \$44 million dollars per year. Yet it is not publicly known where the highest value areas of the coast are for this industry.
- Further, there is limited information about the value of recreational fishing, surfing and associated tourism.

Preferred Practice	Policy Considerations
<ul style="list-style-type: none">➤ Synthesize existing data in a way that protects proprietary information of the commercial fishing industry yet provides sufficient information for socio-economic analysis.	<ul style="list-style-type: none">➤ Continue development of spatially explicit mapping under the Territorial Sea Plan process to identify high value areas for commercial fishing.

4.3 *Need to define the scope of socio-economic effects to be routinely evaluated.*

- As early analysis of socio-economic effects is initiated, it is important to determine what the scope of analysis should include. Key questions include:
 - Will only primary effects be evaluated or will secondary and/or tertiary effects be evaluated?
 - For what period of time should effects be evaluated?
 - Are cumulative effects evaluated? If so, how are they determined?

Preferred Practice	Policy Considerations
<ul style="list-style-type: none">➤ Develop a collaborative agreement on the appropriate scope to be evaluated.➤ For specific projects, use settlement agreement to decide on scope.➤ Implement a form of adaptive management so that if unexpected effects occur, they can be analyzed and addressed.	<ul style="list-style-type: none">➤ No policy considerations at this time.

Appendix A: List of Issues & Limitations

Focus Area 1: Project Planning: Stakeholder Outreach & Site Selection

- 1.1 Stakeholders want to be engaged with developers and regulators prior to site selection.
- 1.2 Current management plans and policies do not provide for well-informed site selection.
- 1.3 Because these activities are so new, many parties are unfamiliar with the regulatory processes, so opportunities for engagement can be missed. A lack of mutual understanding and effective communication during the licensing process stakeholder engagement.

Focus Area 2: Regulatory Framework

- 2.1 Current federal, state and local regulatory processes are not conducive to a phased or incremental development approach.
- 2.2 The absence of a comprehensive plan for ocean renewable energy projects makes it difficult for developers, agencies, and stakeholders to determine the most appropriate areas for project siting.
- 2.3 The regulatory framework for ocean activities beyond state waters is still fairly uncertain and complex.

Focus Area 3: Environmental Effects

- 3.1 Lack of existing baseline and effect studies associated with wave energy devices.
- 3.2 Standard study and monitoring protocols have not been established for wave energy development in the U.S..
- 3.3 The ocean environment can be difficult to effectively evaluate and monitor effects.
- 3.4 There is no existing infrastructure for storing and sharing study and monitoring data.
- 3.5 Lack of defined cumulative effects studies for existing and proposed ocean uses.

Focus Area 4: Socioeconomic Effects

- 4.1 There is limited information and untested methodologies for evaluating the positive and negative effects of ocean renewable energy development on socioeconomic factors.
- 4.2 There is a lack of publicly available information about the location and value of the existing uses of the ocean.
- 4.3 Need to define the scope of socio-economic effects to be routinely evaluated.

Appendix B: List of Preferred Practices

Focus Area 1: Project Planning: Stakeholder Outreach & Site Selection

- ❖ Project developer holds meetings with resource and regulatory agencies (federal, state and local) and local communities to share the project concept and gather input on the project approach prior to submitting preliminary permit or lease applications.
- ❖ After initial applications are submitted, project developer engages in continued outreach to share information and gather input on the project design and approach.
- ❖ Project developer begins early planning and development of an approach to settlement discussions.
- ❖ Project developer holds regular public meetings about the project, the permitting process, and development timeline.
- ❖ Enhance methods for notifying interested parties of applications for Preliminary Permits and Hydrokinetic Leases.
- ❖ Regulatory agencies create "Best Practices" guides to accompany application criteria checklists, and include pre-filing consultation in the best practice guidelines.
- ❖ As a first step in project development, project developers engage with agencies and stakeholders to discuss and evaluate the environmental factors, current uses and statewide planning relative to specific project locations.
- ❖ Project developers utilize stakeholder input to determine the appropriateness of a proposed site and offer alternatives, if appropriate, before developing a preliminary application document.
- ❖ State and federal agencies inform developers of existing information about potential sites and any plans for determining appropriate sites in a particular area.

Focus Area 2: Regulatory Framework

- ❖ Parties engage to collectively develop an effective adaptive management approach to support phased development.
- ❖ Parties design studies for pilot or small scale projects so that they inform the next phase of project development.
- ❖ Develop a standard adaptive management approach that meets all parties' needs for study, evaluation, and decision making for phased development.
- ❖ Parties include a plan for project removal as an alternative if effects are greater than expected.
- ❖ Develop a central data base on ocean resources, study results, etc. This will make the regulatory process easier for future projects.
- ❖ Utilize marine spatial planning, on both the state and federal level, to effectively site projects to minimize the individual and cumulative effects of existing and future ocean uses.
- ❖ Federal agencies consider statewide planning prior to issuing authorizations, and coordinate on all ocean management activities.
- ❖ Federal agencies consider statewide planning prior to issuing authorizations.
- ❖ Federal agencies consider statewide planning policies and goals prior to issuing authorizations.
- ❖ As projects progress, continue to coordinate FERC and MMS regulatory programs and provide guidelines with detailed explanation of how the processes interface relative to procedures and schedules for consultation, environmental review, information filing, etc.

Focus Area 3: Environmental Effects

- ❖ Developers, agencies and stakeholders collaboratively develop an adaptive management approach that meets all parties needs and provides for informed decision-making.
- ❖ Identify baseline and effects studies whose results can be broadly applied and pursue public funding for these studies.
- ❖ Secure cost share, state and federal funding for studies, where appropriate.
- ❖ Encourage collaboration among developers and regulatory agencies to establish viable options for collecting and using baseline information.
- ❖ States and research organizations define the highest concern cumulative effects issues and develop a defined study method.
- ❖ Developers, stakeholders, agencies, and research institutions create and utilize a cost-share program to fund cumulative effects studies that are relevant and useful to all parties.
- ❖ For initial study and monitoring activities, all parties agree on a level of precision that accounts for the nature of the ocean energy industry.
- ❖ Apply the information and “lessons learned” in the initial study and monitoring stage to improve on study methods and design as information is collected.
- ❖ Collaboratively develop standard study and monitoring protocols.
- ❖ Project proponents use study and monitoring methods that are most consistent with existing research, to the extent possible.
- ❖ Individual agencies, organizations, and universities endeavor to identify a public site(s) that identifies and provides access to relevant ocean or study information.

Focus Area 4: Socioeconomic Effects

- ❖ Collect and share existing information to establish more precise values of the existing fishing resources and industry revenues.
- ❖ In the absence of studies or information sources on this issue, estimate and evaluate potential effects through an objective process as part of settlement discussions.
- ❖ Track the values of fishing and recreational resources and revenues after project installation, compare it with the baseline values, and share the findings with state and local communities.
- ❖ Synthesize existing data in a way that protects proprietary information of the commercial fishing industry yet provides sufficient information for socio-economic analysis.
- ❖ Develop a collaborative agreement on the appropriate scope to be evaluated.
- ❖ For specific projects, use settlement agreement to decide on scope.
- ❖ Implement a form of adaptive management so that if unexpected effects occur, they can be analyzed and addressed.

Appendix C: List of Policy Considerations

Focus Area 1: Project Planning: Stakeholder Outreach & Site Selection

- ❖ Provide additional time (more than the current one-year timeframe) within the FERC licensing process to develop and submit the Notice of Intent/Preliminary Application Document (NOI/PAD). Additional time will allow for more sufficient stakeholder engagement in project planning.
- ❖ Modify the MMS lease award procedures to account for the project proponent's level and approach to stakeholder engagement.
- ❖ Amend the Oregon Territorial Sea Plan (TSP) to include spatially explicit information about existing uses and ecologically sensitive areas, so that all parties can be well-informed during site selection.
- ❖ Pursue additional ways to more accurately describe and communicate the function and limitations of a FERC preliminary permit.

Focus Area 2: Regulatory Framework

- ❖ Modify current federal and state permitting/licensing processes to better support phased development.
- ❖ Develop a coordinated approach to federal and state permitting for R&D and pilot scale projects.
- ❖ Adopt a common set of performance standards that can be used to determine if a project may expand or should contract, to the extent possible.
- ❖ Establish federal or state funded test sites to evaluate R&D and pilot scale projects.
- ❖ Develop and implement a coordinated approach to spatial planning, studying and monitoring, and permitting ocean activities with relevant state and federal agencies.
- ❖ Pursue an MOA between the State of Oregon and MMS to identify how MMS will interface with and consider state planning in its process.
- ❖ FERC and MMS synchronize their regulatory programs so that the time and resources required by all parties involved are utilized as effectively and efficiently as possible to provide for responsible and balanced management of ocean activities.

Focus Area 3: Environmental Effects

- ❖ Allocate federal and state funding for baseline studies in those areas that have a high likelihood of being developed.
- ❖ Allocate federal and state funding for effect studies that are of broad application to be maintained in the public domain. For example: acoustic effects, marine mammal entanglement.
- ❖ Dedicate Federal and state funds to cumulative effects studies.
- ❖ Establish an MOA among developers, relevant government agencies (state and federal) to allocate funding for agreed upon cumulative effects studies.
- ❖ Establish information requirements, during the initial stage of a project's development, that acknowledge the limited information and uncertainty of potential effects.
- ❖ Allocate federal funds to establishing standard study and monitoring protocols.
- ❖ Provide federal and state funding to develop a system and infrastructure for storing and sharing information.

Focus Area 4: Socioeconomic Effects

- ❖ Fund educational/research institutions, public agencies and NGOs to develop a scientifically credible approach for gathering data and assessing the positive and negative socioeconomic effects of wave energy.
- ❖ Create legislation that provides incentives and support of educational/research institutions, developers, and agencies for collaboration in order to leverage existing study efforts.
- ❖ Continue development of spatially explicit mapping under the Territorial Sea Plan process to identify high value areas for commercial fishing.

Appendix D: Background Information

Background of Wave Energy in Oregon

Over the last five years, the State of Oregon has become a leading figure in the emerging wave energy industry, and the state has several competitive advantages that make it attractive for wave energy development. The Oregon coast has powerful wave resources that exist within close proximity of transmission access points, and an existing port infrastructure well-equipped to handle the deployment and operations of wave energy facilities. Also, there is broad social support and demand for renewable energy in Oregon, and the state government is actively engaged in fostering the renewable energy industry. State initiatives like Business Energy Tax Credits (BETC) offer incentives for renewable energy projects, and the state's Renewable Energy Portfolio Standard (RPS) ensures demand for wave energy. Furthermore, Oregon boasts a skilled workforce that can meet the employment needs of a developing energy market, as well as industry partners in fabrication and utilities that support wave energy development.

Oregon's role as a leader in the emerging wave energy sector was precipitated by advanced technology research at Oregon State University and a 2004 EPRI study that identified the Oregon coast as having some of the most valuable wave energy resources in the world. Soon after the recognition of Oregon's potential for wave energy, technology developers and coastal municipalities alike raced for priority to study potential development sites. In 2006 and 2007, six Preliminary Permit applications were filed with the Federal Energy Regulatory Commission (FERC) for sites in Oregon. Utilizing a strict scrutiny policy to prevent speculation, FERC carefully reviewed preliminary permit applications for wave energy projects. In 2007, FERC issued the first preliminary permit for a wave energy project to Ocean Power Technologies (OPT) for a site in Reedsport, OR. As of June 2009, there were 4 active Preliminary Permits granted by FERC in Oregon for potential wave energy projects.

In response to these events, the state government initiated multiple measures to establish and develop public-private partnerships that would provide for collaboration between wave park developers, state resource and regulatory agencies, and community stakeholders. In 2006, Governor Kulongoski designated the OPT Reedsport Wave Energy Project as an Oregon Solutions project, with the specific purpose of providing broad stakeholder involvement to support a coordinated, well-integrated permitting and licensing process. The designation of the Oregon Solutions team to the Reedsport project was followed by another significant initiative to foster wave energy development in the state, which was the creation of the Oregon Wave Energy Trust.

Oregon Wave Energy Trust

The Oregon Wave Energy Trust – with members from fishing and environmental groups, industry and government – is a nonprofit public-private partnership funded by the Oregon Innovation Council in 2007. Its mission is to serve as a connector for all stakeholders involved in wave energy project development – from early stage community engagement to final deployment and energy generation – positioning Oregon as the North America leader in this nascent industry and delivering its full economic and environmental potential for the state. OWET's goal is to have ocean wave energy producing 2 megawatts of power – the equivalent of about 800 homes – by 2010 and 500 megawatts of power by 2025.

Current Landscape

On March 26 2008, Governor Kulongoski issued an Executive Order directing the Department of Land and Conservation Development to amend the Territorial Sea Plan to include guidelines for the development of wave energy. On the same date, the State of Oregon and FERC signed an Memorandum of Understanding (MOU) to coordinate procedures and schedules for review of wave energy projects in state waters off the coast of Oregon. The MOU indicates that FERC will consider Oregon's State Plan prior to the issuance of any new preliminary permits.

The Territorial Sea Plan Amendment process was initiated in December, 2008 and is currently in progress. A key element of the amendment process is the collection and mapping of key information regarding the location and value of existing commercial fisheries. This information will be used to develop a spatial map identifying areas of high value for other uses. The process may also identify areas off the coast of Oregon that are more desirable for wave energy development.