

Offshore Alternate Energy Project Outlook  
Permitting and Environmental Issues.



Offshore Alternate Energy Project Outlook –  
Permitting and Environmental Issues.



## Topics of Discussion

- An brief overview of the range of potential alternate energy technologies;
  - The permitting process including a comparison of agency roles and responsibilities based on the location or technology proposed;
  - The key environmental issues that need to be addressed during the installation and operation of offshore facilities; and
  - Recommendation to successfully develop an offshore alternate energy project.
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## Why do we Care?

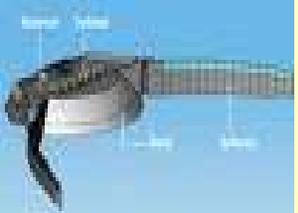
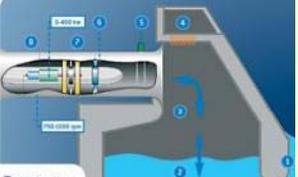
State utilities  
must provide  
33% of their  
electrical power  
supply by 2020  
from renewable  
sources



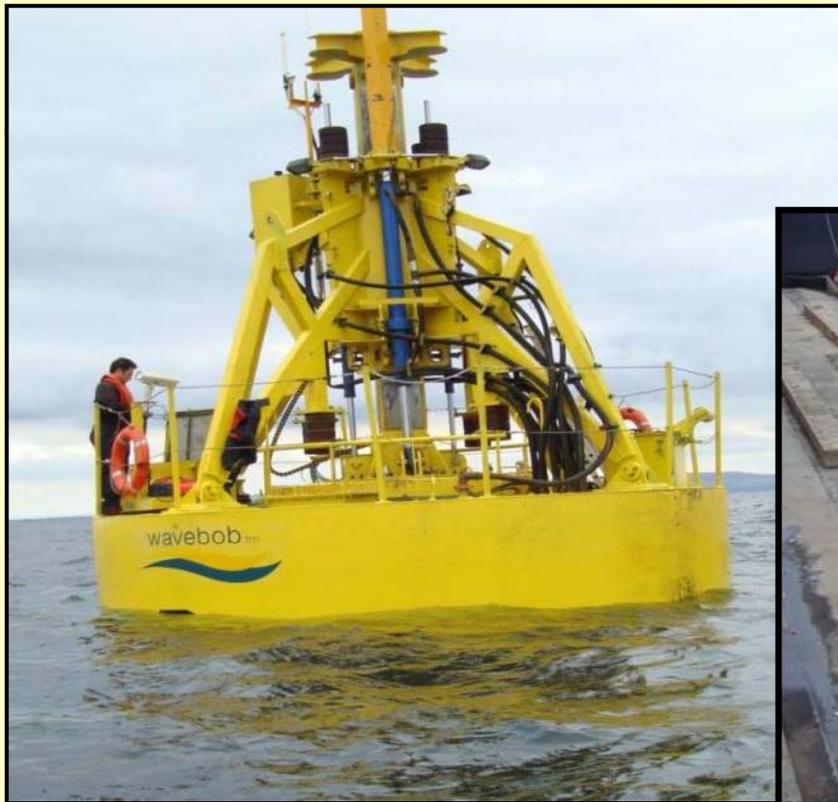
“The state may be a budgetary disaster,  
but its energy policies are a blueprint for  
national innovation.” – The Atlantic Oct ‘09

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## Technology Options - Wave Energy

	Type	Description	Companies
	Attenuator 750 kW	Waves move articulated joints, pressurizing hydraulic rams coupled to a servo-motor.	<ul style="list-style-type: none"> <li>• Pelamis</li> <li>• Wave Star</li> </ul>
	Point Absorber 750 kW	Waves move outer taurus relative to a long float, driving servo-motor or linear induction generator.	<ul style="list-style-type: none"> <li>• Wavebob</li> <li>• OPT</li> <li>• AWS</li> </ul>
	Overtopping 7 MW	Waves directed by long concrete wings into reservoirs on saucer-like platform. Drive 6 to 24 low-head hydroturbines.	<ul style="list-style-type: none"> <li>• Wave Dragon</li> <li>• Floating Power Plant</li> </ul>
	Oscillating Water Column 1 to 3 MW	Waves wash into a chamber, pushing an air column upward and through an air turbine.	<ul style="list-style-type: none"> <li>• Ocean Energy</li> <li>• OceanLynx</li> </ul>

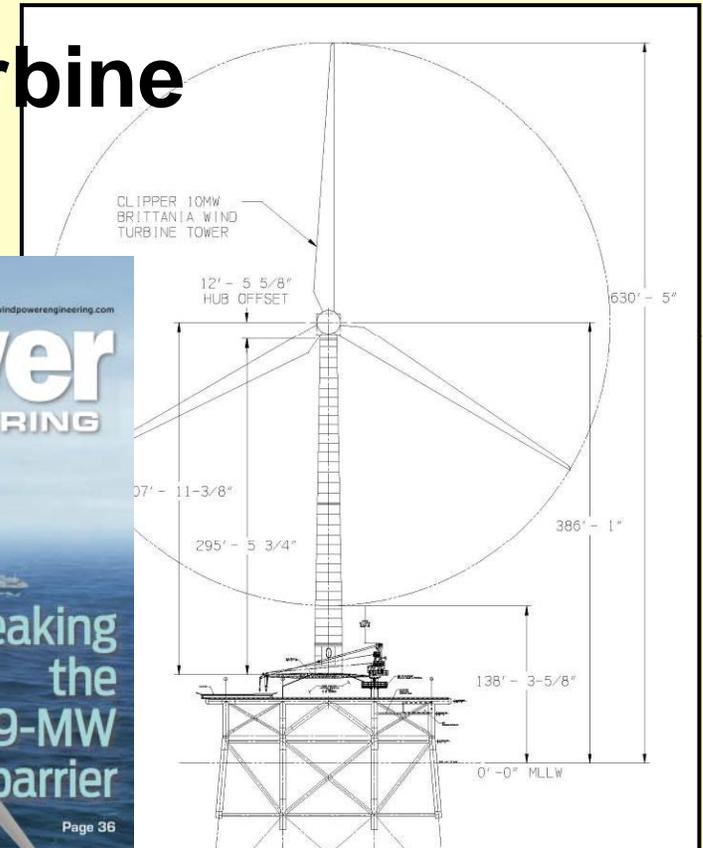
# Wave Energy - Scale



## Wind Energy - Scale



# Clipper Wind Britannia Turbine



## Wave/Wind Energy – Federal Regulations

- Federal Energy Regulatory Commission (FERC) historically has taken the lead on offshore energy projects.
  - New BOEM (formerly MMS) Renewable Energy/Alternate Use Regulations issued April 2009, guidance July 2009
    - Regulations promote use of OCS for renewable energy at new sites and “Alternate Use of Existing Facilities”
    - Hydrokinetic (wave or current) projects also require a FERC license if connected to the grid
    - Non-Hydrokinetic (wind and solar) projects do not require FERC approval with the exception of the tie-in to the electrical grid.
    - Can be pilot projects (Limited Lease) or commercial projects (Commercial Lease)
    - Alternate Use of Existing Facilities requires a Right of Use and Easement [RUE] from BOEM
-

## Wave/Wind Energy– OCS Regulations

- BOEM must determine competitive interest.
    - Time to grant commercial lease: 1 to 2.5 years (non-competitive vs. competitive interest); time for pilot project RUE could be shorter
    - Cost of RUE: \$5/acre; \$3200/sq. mile
  - Noncompetitive Lease Process
    - Requires submission of General Activities Plan (GAP)/Right of Use and Easement (RUE)
    - Environmental Review in compliance with NEPA
    - Consultation and permit approvals from other applicable agencies.
    - BOEM issues Decision on GAP/RUE
  - Subject to Federal Consistency Review by California Coastal Commission.
  - Additional State Waters and Local Approvals for Tie-in to Shore.
-

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### Wave/Wind Energy – State Waters Regulations

- Subject to Tidelands Lease from the California State Lands Commission
  - CEQA Lead Agency
- FERC License for tie-in to Onshore Grid.
  - NEPA Lead Agency
  - Pilot versus Commercial Lease
- Local approvals (CDP/CUP) for onshore components

**PG&E Central Coast WaveConnect™ Project  
Known Licensing and Permitting Agency Roles**

**Licensing and Permitting Agencies**

Agency	Permit or Authorization	Purpose	Authority
<b>1. Federal Agencies</b>			
• Federal Energy Regulatory Commission	• Hydrokinetic Pilot Project License	• Responsible for siting and operation of hydrokinetic testing facilities	• Federal Power Act
• United States Fish and Wildlife Service	• Incidental Take Authorization (terrestrial species)	• Protection and recovery of threatened and endangered species	• Federal Endangered Species Act
• National Marine Fisheries Service	• Incidental Take Authorization (marine species) • Marine Mammal Permit (non-listed marine mammals)	• Protection and recovery of threatened and endangered species and marine mammals	• Federal Endangered Species Act • Marine Mammal Protection Act
• United States Army Corps of Engineers	• Section 10 Permit • Section 404 permit (if waters of the US are dredged or filled)	• Responsible for use of navigable waterways • Protect water quality and wetlands	• Rivers and Harbors Act • Clean Water Act
• United States Coast Guard	• Marking of Offshore Renewable Energy Installations	• Responsible for siting of navigation aids in coastal waters	• 33 CFR 66
<b>2. State Agencies</b>			
• California Coastal Commission	• Coastal Development Permit, offshore facilities	• Responsible for development in the Coastal Zone, ensures public access to the Coastal Zone	• California Coastal Act • Coastal Zone Management Act
• California State Lands Commission	• Submerged Lands Lease • CEQA Certification	• Leasing of state-owned submerged lands • Responsible development of projects on state submerged lands	• Submerged Lands Act/California Public Resources Code Section 4702 • California Environmental Quality Act
• California Department of Fish and Game	• Incidental Take Authorization • Streambed Alteration Agreement (if stream crossing)	• Protection and recovery of threatened and endangered species	• California Endangered Species Act • California Fish and Game Code, Section 1603
• California State Water Resources Control Board	• Section 401 Water Quality Certification • Waste Discharge Requirements (if waters of the state) • General National Pollution Discharge Elimination System Permits for construction and operation	• Protect and manage water quality	• Federal Clean Water Act • Porter-Cologne Water Quality Control Act
• California Office of Historic Preservation	• National Historic Preservation Act Section 106 compliance review	• Protect and manage historic properties and other cultural resources	• National Historic Preservation Act
<b>3. Local Agencies</b>			
• Santa Barbara County	• Coastal Development Permit (on-shore)	• Responsible for siting and construction of facilities in public roadways	• California Coastal Act Local Coastal Plan
• Other local agencies, as appropriate.			

**Other Non-Permitting Interested Governmental Agencies, Entities**

**Federal Agencies**

- U.S. Department of Energy – Funded WaveConnect Project design and permitting, fosters renewable energy development
- National Renewable Energy Laboratory – Conducts renewable energy research

**State Agencies**

- California Public Utilities Commission – Funded WaveConnect Project design and permitting, regulates investor-owned utilities such as PG&E
- California Ocean Protection Council – Conducts research and formulates policy focused on protecting California's marine resources
- California Energy Commission – Fosters renewable energy development and energy conservation in California

**Local Agencies**

- University of California, Santa Barbara
- Channel Islands National Park
- California Department of Fish and Game (Vandenberg State Marine Reserve)
- Jalama Beach County Park



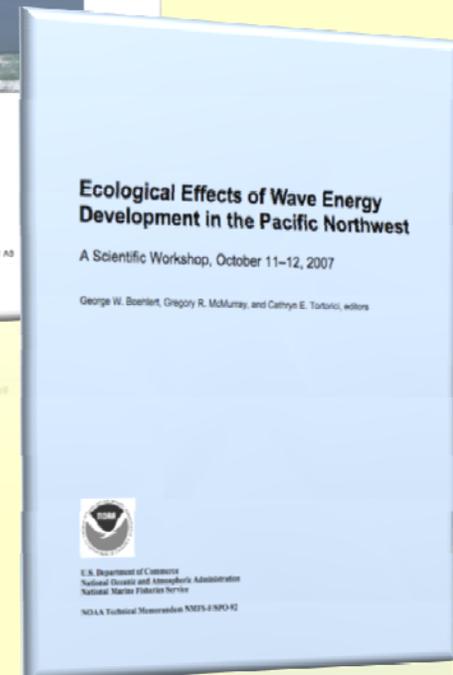
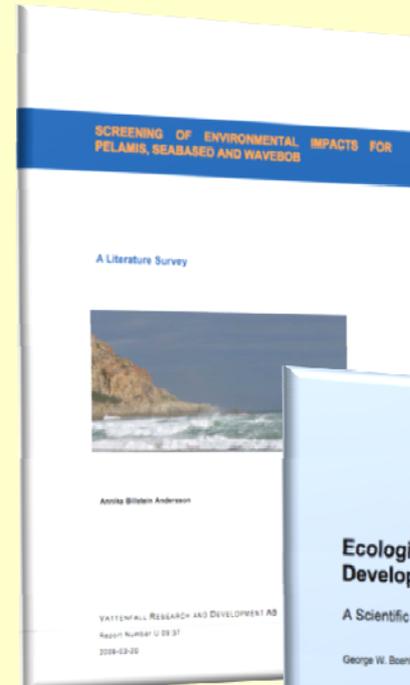
# Stakeholder Analysis

- **Agency Staff**
  - Minerals Management Service
  - California State Lands Commission
  - County Planning Department
  - California Coastal Commission
  - Air Pollution Control District
  - Coast Guard
  - Army Corps of Engineers
  - NOAA Fisheries
  - California Department of Fish and Game
  - U.S. Fish and Wildlife Service
  - State Historic Preservation Office
  - Regional Water Quality Control Board
  - State Water Resources Control Board
  - Fire Protection Services
  - Department of Toxic Substances
  - California Department of Parks and Recreation
  - U.S. Air Forces
  - U.S. EPA
  - U.S. Navy
  - Federal Aviation Administration
  - Federal Communications Commission
  - Federal Energy Regulatory Commission
  - Department of Transportation
  - Caltrans
  - State Fire Marshalls Office
- **Political Bodies**
  - Congressional Representatives
  - California State Lands Commission
  - Governors Office
  - State Legislative Representatives
  - County/City Board of Supervisors
  - County/City Planning Commission
  - California Coastal Commission
- **Non-Agency**
  - Private Land Owners
  - Railroad
  - National Environmental Groups
  - Local Environmental Groups
  - Native American Groups
  - Utilities (SoCal Gas and SoCal Edison)
  - Commercial Fishermen
  - Sport Fishermen

## Key Environmental Issues

### Offshore Issues

- Geology
  - Surficial seafloor geology
  - Foundation Support
- Water Resources
  - Wave Energy and Movement
- Marine Biology
  - Seafloor habitats
  - Marine mammal resources
  - Marine Birds
- Recreational Resources
- Fisheries
  - Commercial fishing
  - Recreational fishing
- Air Quality
  - Vessel emissions
  - Greenhouse gases
- Aesthetics
- Cultural Resources
- Socio-cultural Resources

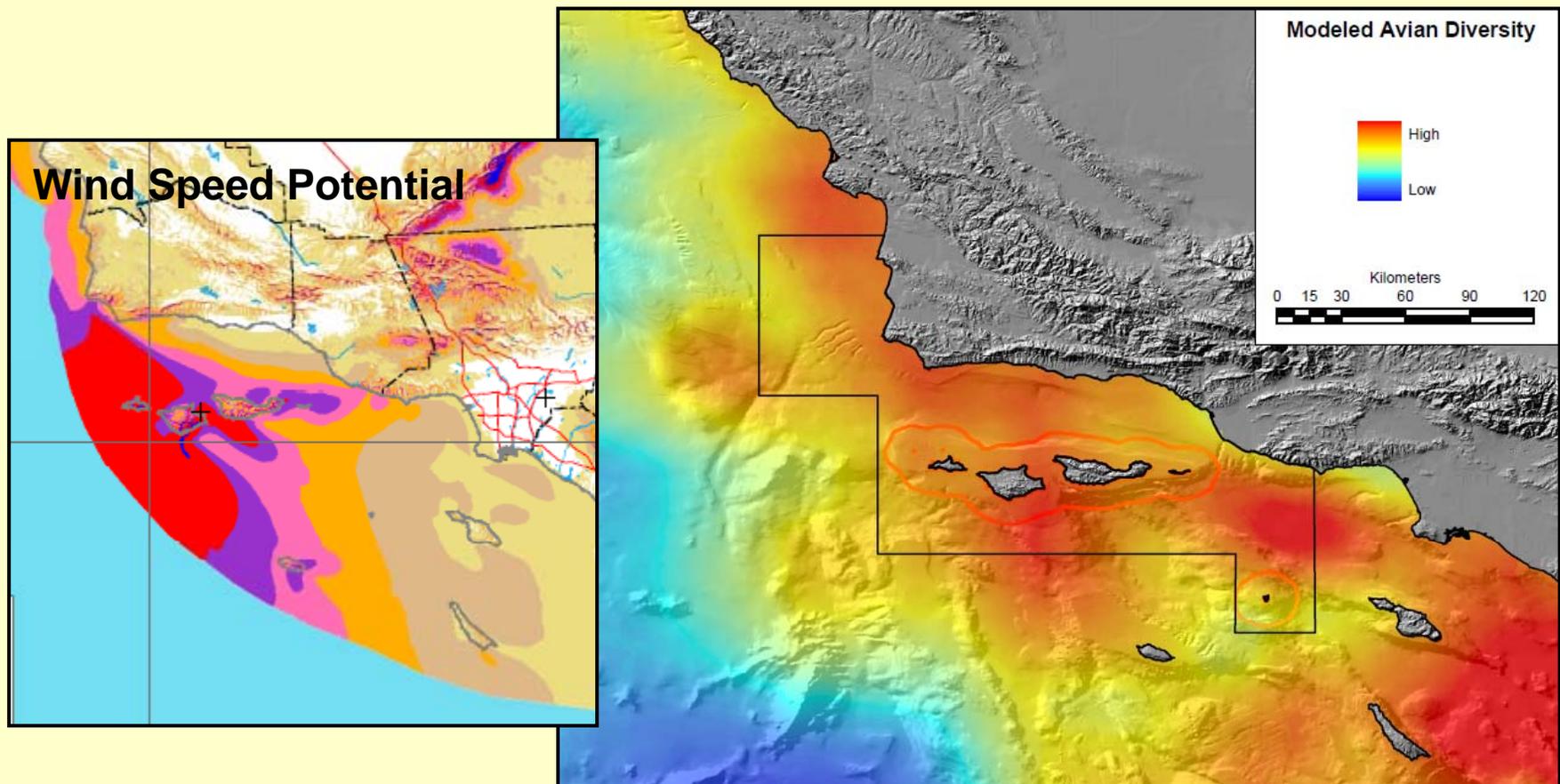


## Offshore Biological Resources

- Sensitive Habitats and Resources (kelp beds, hard bottom habitat)
  - Anchoring plans
  - Artificial Reef Creation
  - Bio-fouling
  - Cable routing
- Marine Mammals
  - Vessel and construction noise
  - Facility interactions with migration patterns
  - Electromagnetic Fields
- Marine Birds
  - Night lighting
  - Bird Strikes
- Threatened and Endangered Species

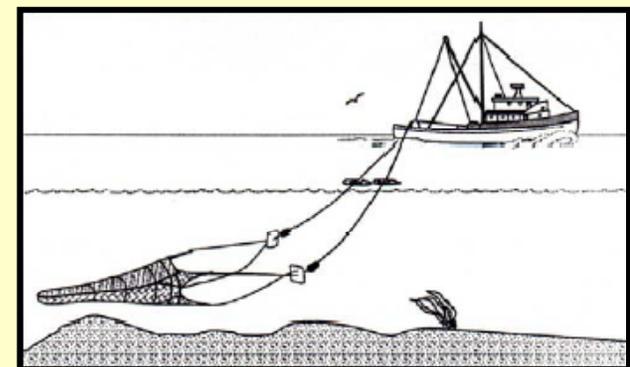
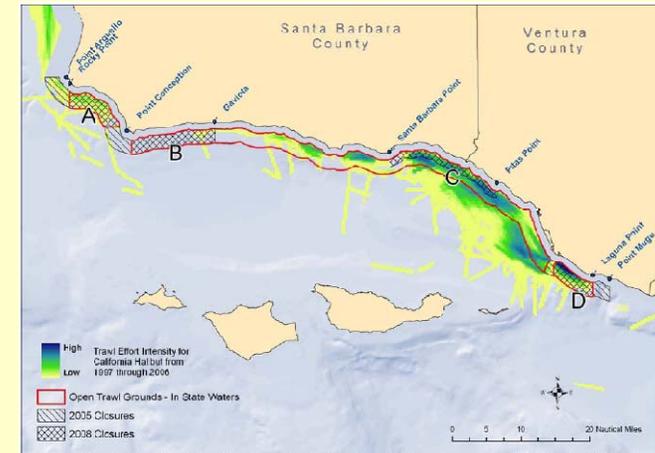


# Wind Energy and Bird Density



## Commercial and Recreational Fishing

- Preclusion areas
- Increased vessel movements
- Competition for harbor resources
- Recreational fishing impacts in nearshore areas.
- Considerable changes in level of commercial fishing in the area.



## Onshore Resources

- Biological Resources
  - Sensitive animal and plant species
- Recreational Users
- Noise Impacts
- Visual Impacts
- Tourism Impacts



## Key Challenges to Alternative Energy Projects

- Harsh Physical Environment
  - Extensive spatial footprint
  - Emerging Technology with under capitalized developers
  - Complex multi-agency permitting requirements
  - Recently implemented regulatory setting
  - Lengthy Permitting Process – Likely two step process
  - Undocumented environmental impacts
  - Limited marine construction and support infrastructure
-

## Recommendations

- Focus CEQA/NEPA review process on initial deployment (pilot projects)
- Use the pilot project process to frame potential environmental impacts
- Establish balanced user group agreements
- Encourage utility/public partnerships with technology developers
- Provide Federal and State funding guarantees
- Provide permitting agencies clear public policy guidance regarding need to provide alternate energy projects.

The New York Times

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### Offshore Wind Power Line Wins Backing

By MATTHEW L. WALD  
Published: October 12, 2010

#### Seizing the Wind

Google and Good Energies have each agreed to invest in a proposed \$5 billion transmission line that could carry as much as 6,000 megawatts of electricity from wind farms off the Mid-Atlantic coast.

The 350-mile underwater spine, which could remove some critical obstacles to wind power development, has stirred excitement among investors, government officials and environmentalists who have been briefed on it.

Google and Good Energies, an investment firm specializing in renewable energy, have each agreed to take 37.5 percent of the equity portion of the project. They are likely to bring in additional investors, which would reduce their stakes.



Atlantic Wind Connection Phase 1

Electrical grid connections

100 MILES

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