BRINGING CLIMATE CHANGE HOME TO MEET YOUR COMMUNITY: STAKEHOLDER PERCEPTIONS OF OFFSHORE WIND ENERGY IN HUMBOLDT COUNTY, CALIFORNIA

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ABSTRACT

BRINGING CLIMATE CHANGE HOME TO MEET YOUR COMMUNITY: STAKEHOLDER PERCEPTIONS OF OFFSHORE WIND ENERGY IN HUMBOLDT COUNTY, CALIFORNIA

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As impacts from anthropogenic climate change continue to manifest at global and local scales, communities are increasingly seeking solutions to transition the world away from fossil fuels. Novel renewable energy technologies, including offshore floating wind energy, continue to garner developer interest. Technological success, however, is one small piece in the effort to decarbonize. Project developers are required to engage in political and bureaucratic processes and work with communities where projects may be sited. Balancing community perceptions and needs, as well as permitting and leasing processes, with increasing pressure to decarbonize will be key as the fight against climate change continues. This research explores stakeholder perceptions of proposed offshore wind energy development as they relate to the development process and climate change in Humboldt County, California. I utilized semi-structured interviews, procedural analysis, and participant observations to identify the ways in which stakeholders balance their general support of renewable energy and concern for climate change with the impacts and 'unknowns' of localized development. I find that stakeholders weigh numerous concerns when considering offshore wind development in Humboldt County, and climate change is not the most salient factor in the discussion. Indeed, stakeholders

themselves are unsure how to balance impacts from climate change with impacts from project development, much less where their respective communities fit in that discussion.

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Lastly I would like to thank my mother—a woman who has struggled all her life against personal and systemic barriers. Every day we move forward.

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1. INTRODUCTION

As we exceed 400 PPM of Carbon Dioxide (CO2) in the atmosphere on average, entities such as the Intergovernmental Panel on Climate Change have expressed a need for clean and renewable energy generation (Seyboth, et al., 2012). Technologies such as solar panels, biomass conversion systems, and wind mills have become popular alternative energy sources and operate all over the world. Newer technologies such as floating offshore wind turbines and wave energy generation have also emerged on the market with the promise of more constant and reliable power. Many nations, and states such as California, have set ever increasing renewable portfolio standards (RPS) and GHG reduction goals that aim to promote transitions to renewable energy technologies (de Leon, 2015; de Leon, 2017).

Offshore floating wind and other technologies coming to market promise to increase clean energy output worldwide. Offshore wind turbines come in a variety of sizes and styles, ranging from shallow (30 m) to deep (>60m) (BOEM and NREL, 2018). Developers themselves have already seen successes with stationary, or fixed-bottom offshore wind turbines on the East Coast of the United States. The state of New York just announced that it granted two new offshore wind projects off the coast of Long Island, totaling 1,700 MW (Frangoul, 2019).

While fixed-bottom turbines have not been feasible on the West Coast due to the deep and sloping offshore topography, new projects in Europe are showing success with floating platforms for offshore wind, potentially opening up the California market

(Greenson, 2018). In 2011, offshore wind engineering company Principal Power launched WindFloat 1, a floating offshore wind test project off the coast of Portugal, which produced over 17 Gwh of energy to the grid in a five-year period (Principle Power Inc., 2017). Portugal has just invested $1.28 billion in floating offshore wind technology and believes that it could satisfy up to 25% of energy demand in the nation (Weyndling, 2019)

This increasing interest in offshore wind has trickled into discussions on the West Coast. In 2016, Trident Winds, LLC submitted an unsolicited lease request to the Bureau of Ocean Energy Management (BOEM) in an effort to acquire an offshore wind energy lease along California's central coast. In response to the unsolicited lease request, then Governor of California Jerry Brown formed an Intergovernmental Working Group to discuss the possibilities of this type of renewable energy generation (Thurston 2018; Douglas 2018). This group is led by BOEM and includes the California Energy Commission (CEC), local governments from the central and northern coasts of California, and federally recognized tribes (Thurston, 2018). There have been two meetings of this working group so far: one in October of 2018 and another in September of 2019.

While developer interest increases, the Department of the Navy is working with agencies and developers to clarify operations conflicts between ideal lease sites and offshore naval training operations. Navy concerns have so far thrust Northern California, and Humboldt County in particular, into the spotlight as a seemingly negotiable leasing area (Douglas 2018). Humboldt Bay was initially defined as a "green" zone, indicating

no Naval conflicts, but has since been reclassified as a “yellow” zone, indicating that some Navy negotiation is necessary in the planning process (Departmnet of Defense, 2018). Developers are also interested in a potential lease offshore of Humboldt County due to its deep-water port and phenomenal offshore wind resource (Figure 1) (Musial et al., 2016). Wind resources in California are primarily located in ferderal waters between 3 nautical miles and 200 nautical miles. Transmission cables used to transport generated energy would move from federal to state waters (3 nautical miles to shore).

In March of 2018, Humboldt County’s Redwood Coast Energy Authority

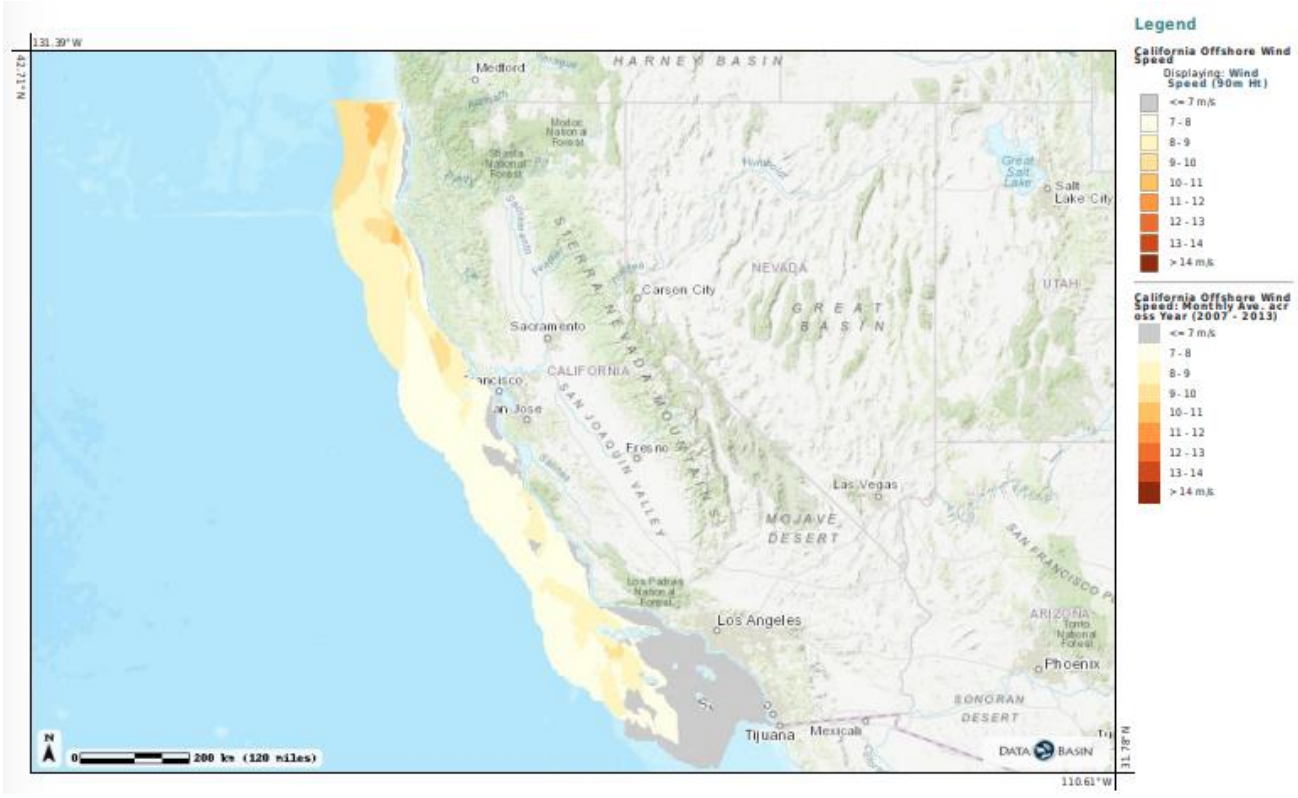

Figure 1: California Offshore Wind Speeds, obtained from California Offshore Wind Gateway

(RCEA), created a public-private consortium to submit an unsolicited lease request to the

Bureau of Ocean Energy Management (BOEM) for offshore wind development on the North Coast. They submitted the unsolicited lease request three days before BOEM released its own Call for Information and Nominations (CIN) to solicit public comment and developer interest in four potential lease sites off the coast of California. When releasing the CIN, BOEM informed RCEA that their unsolicited lease request would be enveloped into their own call and larger competitive leasing process (Sumait, 2018). BOEM released the results of the CIN in early 2019 and is currently preparing for a lease auction (BOEM, 2019).

While developers begin to pursue offshore wind projects on the West Coast, California currently has no statutory goals for offshore wind energy specified (Douglas, 2018; de Leon, 2017; de Leon, 2015). In fact, California has a policy to remain neutral in technology conversations as they relate to their GHG reduction goals (Douglas, 2018). BOEM has established leasing procedures from fixed-bottom offshore wind on the East Coast, as well as oil and gas development generally, and has employed existing procedures in offshore talks in California. These existing projects and procedures are being used by developers and industry insiders to prepare expanded development (Froese, 2019).

A key part of the development process that should not be overlooked, however, is the role of stakeholders and the local community. A successful project on the West Coast not only faces technological stressors, but must also successfully work with local communities and government agencies to address concerns, impacts, and potential community benefits. Understanding the human dimensions of renewable energy

development is pivotal not only for project completion, but also for the monetary bottom line as delays in permitting and development processes can significantly drive up project costs (Goodrich, et al., 2012). Stakeholders interactions with a project, and community perceptions as a whole, can be complex and affect the development process from siting to decommissioning (Hingtgen, 2006).

While viewshed concerns are perhaps the most well-known examples of stakeholder opposition to wind energy in the United States, stakeholders have listed several concerns with wind turbines, including wildlife impacts and noise, and groups can and will mobilize to end the development process of such projects (Hingtgen, 2006; Oteman et al., 2014).

This research explores stakeholder perceptions of proposed offshore wind energy development as they relate to the development process and climate change in Humboldt County, California. I utilized semi-structured interviews, procedural analysis, and participant observations to examine the ways in which stakeholders balance their general support of renewable energy and concern for climate change with the impacts and 'unknowns' of localized development. I aimed to answer the following research questions:

1. How do stakeholders perceive offshore wind energy development off the coast of Humboldt County?
    a. What factors currently affect stakeholder support or opposition?
    b. What benefits do stakeholders perceive?
2. What are stakeholder perceptions of the development process so far?

   a. In what ways does the development process include community input?
   b. In what ways does the development process include impacts from climate change?

3. What role does climate change play in stakeholder perceptions of offshore wind energy in Humboldt County?
   a. How does concern for climate change affect support or opposition?

Findings from this research can be used by both developers and government entities to access early community perceptions of offshore wind energy development in Humboldt County. Findings can also be used by communities wishing to understand further the complex relationship between the development process and climate change.

2. LITERATURE REVIEW

Numerous studies and analyses have been conducted to describe the transition from fossil fuels to renewable or low carbon forms of energy. As renewable energy development continues to rise in the United States to meet both renewable energy goals and the demands of climate change, this research becomes more vital to understand the drivers and barriers to development on both small and large scales. This literature review examines stakeholder perceptions and community engagement of offshore wind energy both in the United States and Europe.

Interest in offshore wind energy has skyrocketed in recent years due to improvements in technology, consumer and investor confidence, and increased interest in carbon free or carbon light energy sources. Global production of offshore wind surpassed 18 GW of installed capacity in 2017 (Global Wind Energy Council, 2019). By 2050, the International Renewable Energy Association estimates that installed capacity will increase by 501.8 GW (International Renewable Energy Agency, 2018). As of 2018, there were a total of 105 grid-connected offshore wind farms in Europe, and one grid-connected commercial offshore wind farm in the United States (Selot et al., 2019 p.11; Office of Energy Efficiency and Renewable Energy, 2019). There are currently 15 active offshore wind leases in the United States, totaling 21 GW of capacity (BOEM, 2019). There are additional plans to open up leasing opportunities in California, Oregon, and Washington.

According to Pew Research Center, 83% of Americans support more development of wind farms (Pew Research Center, 2016). Despite this large support, project development in local communities still faces many hurdles, both in the public and permitting spheres (Storrow, 2019; Gloden, 2018).

2.1 Offshore Wind in the United States

The Bureau of Ocean Energy Management (BOEM), under the Department of Interior, manages federal offshore leasing (both renewable and non-renewable) in the United States. There are currently 15 active federal commercial or noncompetitive leases in 9 different states, and 1 expired lease (Table 1).

Table 1: Offshore Renewable Leases in the United States

Lessee	*Location*	*Lease Status*	*Number of Leases*
Bluewater Wind Delaware, LLC	Delaware	Active, Non-Competitive, Site Assessment Phase	1
Skipjack Offshore Energy, LLC	Delaware	Active, Non-Competitive, Site Assessment Phase	1
Deepwater Wind New England, LLC	Rhode Island/Massachusetts	Active, Operations Phase	2

Lessee	*Location*	*Lease Status*	*Number of Leases*
(Block Island Wind Project)			
Virginia Electric and Power Company	Virginia	Active, Site Assessment Phase	1
U.S. Wind Inc.	Maryland	Active, Site Assessment Phase	1
RES America Developments Inc.	Massachusetts	Active, Site Assessment Phase	1
Offshore MW, LLC (Vineyard Wind)	Massachusetts	Active, Site Assessment Phase	1
Equinor Wind US, LLC	Massachusetts	Active, Preliminary Term	1
Mayflower Wind Energy, LLC	Massachusetts	Active, Preliminary Term	1
Vineyard Wind, LLC	Massachuesetts	Lease in Progress	1
Cape Wind Associates LLC. (Cape Wind Project)	Massachusetts	Relinquished	1

Lessee	*Location*	*Lease Status*	*Number of Leases*
EDF Renewables Development, Inc.	New Jersey	Lease transferred from U.S. Wind Inc. December 2018	1
RES America Developments Inc.	New Jersey	Active, Site Assessment Phase	1
Statoil Wind US, LLC	New York	Active, Site Assessment Phase	1
Avangrid Renewables, LLC	North Carolina	Active, Site Assessment Phase	1

Note: Lease information is provided as currently reported on BOEM's renewable energy website. Information may not be reflect all U.S. development and/or legal transfers.

The term 'stakeholder' itself is broad and often contested as a concept (Friedman & Miles, 2009; Miles, 2012). The public, communities, and the planet as a whole have a 'stake' in acquiring and producing energy, and as the IPCC points out, also meeting the needs of future generations through sustainable practices (IPCC, 2001). However, the scope of this research aims to identify and describe concerns from immediate user groups that will interact with the process (as described by Mitchell et al., 2003).

Massachusetts is currently the state with the most active offshore leases in the United States. Perhaps the most well-known lease is the Cape Wind Project, which is the only relinquished lease out of six total offshore leases in the state. The Cape Wind

example provides much needed insight on stakeholder interactions with the offshore development process in the United States—particularly for viewshed concerns. Cape Wind Associates LLC secured the first offshore wind lease in the United States in 2010 after working extensively with the Army Corps of Engineers and the Minerals Management Service (now BOEM) beginning in 2001. The proposed project off the coast of Nantucket Sound generated immediate debate about climate change, renewable energy placement, and existing coal facilities (Phadke, 2010). Wealthy and influential stakeholders, concerned about visible turbines and corresponding property values, aimed to delay the development of the Cape Wind project by investing in opposition groups (Davidson, 2018). Both project proponents and opponents used viewshed imagery to sway public opinion to their side (Phadke, 2010). Surveys conducted by Cape Wind Associates to assess stakeholder's feelings towards the proposed Cape Wind project showed that initial support of the project was around 55% in 2002. However, by 2005 a different survey conducted found that public support had flipped to 55% opposed two years later (Alessi, 2017; Firestone & Kempton, 2007, p.1586). The most common reasons for opposition were potential wildlife impacts, viewshed, and impacts to the recreational and commercial fishing industries (Firestone and Kempton 2007, p.1587). After years of delay, stakeholder opposition, and over two dozen lawsuits, the developer relinquished its lease and power purchase agreement in 2015 (Davidson, 2018; Endemann & O'Neill., 2018).

Other developers in Massachusetts are taking lessons from the Cape Wind controversies. The Vineyard Wind project is a proposed 800 MW wind farm located in

federal waters between Martha's Vineyard, MA, and Block Island, RI. The proposed project was formed out of a community cooperative, Vineyard Power, that exists to provide local ownership of renewable energy projects and enhance local decision making (Klain et al., 2017). The cooperative worked with local communities to determine concerns, such as distance from shore, and lessons learned from the Cape Wind Project (Klain et al., 2017, p.18). In 2015, a lease was obtained by developer Offshore MW, LLC, and given a 10% price reduction for the community benefits agreement negotiated with Vineyard Power (Klain et al., 2017, p.18). The project is currently in its site assessment phase, and stakeholders remain engaged.

Local commercial fishermen are particularly concerned about the project disrupting existing fishing lane agreements between lobsterman and trawlers (Abel, 2018). To address these concerns, the developer has reduced the planned wind farm's footprint by 20% and changed the turbine placement to allow for easier transit to the south of Martha's Vineyard (Cape Cod Today, 2019). The Responsible Offshore Development Alliance (RODA), a coalition of fishing industry participants concerned with loss of fishing opportunities, has emphasized that they are more concerned with creating dedicated transit routes through all, not just one, of the proposed wind farm lease areas in Massachusetts. RODA has since signed a 10-year memorandum of understanding with BOEM and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries that establishes a collaborative effort to engage with fishing community on offshore wind energy development on the Atlantic Coast (National Oceananic and Atmospheric Administration (NOAA), 2019).

The Block Island project in Rhode Island is the only developed commercial offshore wind farm in the United States. Before the project was even proposed, Rhode Island began a marine spatial mapping project that engaged local communities to gather relevant data about state waters, including stakeholder and fishermen usage (Klain et al. 2017, p. 18-20). The subsequent Rhode Island Ocean Special Area Management Plan acted as a common and accepted dataset with which to negotiate (Klain et al. 2017, p. 21). Researchers at the University of Rhode Island noted that some surveys found that coastal residents feared that the installation of the Block Island Wind Farm would negatively impact tourism and be an "eyesore" (University of Rhode Island, 2019). Stakeholders in Rhode Island believed that in order to mitigate for the impacts caused by offshore wind, that community benefits including jobs, apprenticeships, and educational opportunities needed to be made available to them (Klain et al. 2017, p. 22). Local consultants were hired to work with the community to address concerns and develop intentional community benefits, such as connecting the community to the larger grid, and including fiber optic cables for high speed internet. These early engagements with stakeholders and community benefits are credited with the ultimate development of the project (Klain et al. 2017).

During the construction phase itself, over 300 local unionized workers were employed (Benson, 2017). This included over 200 skilled construction and trade workers, and over 100 logistics workers (Gould & Cresswell, 2017). The union workers were paid between $28 and $40 per hour and were also provided benefits (Bragg, 2017). A survey conducted by the University of Rhode Island noted that while recreational fishermen

viewed the wind turbines positively, commercial fishermen viewed them mostly negatively (Detz, 2019). Both recreational and commercial fishermen agreed that there was an increase in boat activity near the project site due to “wind tourists” and recreational fishermen. However, the commercial fishermen viewed the increase in activity as a hindrance to their fishing operations. Moreover, commercial fishermen had the added concern of avoiding entanglements between their gear and offshore wind project cables and equipment. Ultimately, the wind farm left commercial fishermen with less space to conduct business due to the increase in activity from recreational fishermen and tourist boats (Detz, 2019). Since the completion of the Block Island Wind Farm, planning for additional projects has begun throughout the New England area.

Finally, the Monhegan Island project in Maine is proposed in state waters that has utilized community use mapping, frequent public meetings, and site exchanges between fishermen and developers (Klain et al., 2015; Island Institute, 2018). Unexpected changes in scale, however, and communications breakdowns have led to increased tensions between fishermen and developers (Klain et al. 2015). Other fishermen cited concerns such as loss of fishing grounds, changes in fish species, damages to gear, and congestion of fishermen in alternate locations. Some have requested the consideration of job training compensation for those fishermen who may lose their jobs due to the proposed project (BOEM, 2012).

2.2 Offshore Wind in Europe

Offshore wind energy development in Europe is distinctly more advanced than in the United States. Europe has 105 grid-connected offshore wind farms, the majority of which are fixed bottom (not floating) and fairly close to shore (Selot et al. 2019, p.11).

Developer engagement with fishing communities in Europe has been contentious. The impacts to commercial and recreational marine fishing communities in Europe vary by country based on project-specific restrictions. In Belgium, fishermen aren't allowed to come within 500 meters of any offshore wind farm, which some fishermen say concentrates fishermen in areas that could imperil regional stocks (Bolongaro, 2017). In the UK, fishermen are allowed to fish throughout the farm except during times of construction and maintenance. However, some fishermen claim that they've seen a decrease in fish populations near recently constructed farms, stating that areas formerly abundant with fish are now barren (Bently, 2018). Some coastal areas were not mapped for baseline data to monitor the effects of the arrays on fish populations. However, areas that *were* mapped show that the biggest impacts to populations come during the construction phase (Bently, 2018). To avoid fishing disputes, Denmark requires developers to compensate fishermen for any loss of fishing ground due to an offshore wind development project. In some cases, this has worked to bring developers and fishermen to the table early to avoid impacts, build mutual understanding and trust, and avoid unnecessary fees (Danish Energy Agency, 2018).

In the U.K., environmental laws for offshore wind projects are stringent and robust. For migratory bird populations, each wind farm is addressed differently based on the different species' migratory patterns. Additionally, the decommissioning of offshore

wind turbines will need to follow the Decommissioning of Offshore Renewable Energy guidelines, which require them to be reused, recycled, or incinerated with energy recovery (Hussain, 2019).

In Germany, offshore wind farms are facing criticism and even lawsuits for their potential environmental and wildlife impacts (Burghardt, 2019). German environmentalists are particularly concerned about marine avian habitat in relation to siting of North Sea offshore wind farms. To ensure the safety of the avian population, expert technical analysis and biological surveys are required for every environmental impact report, and projects are not accepted if they pose significant adverse effects. Additionally, all projects must follow a set of measures including selecting least noise-intensive foundations and banning all noise-producing construction during mating and calving periods for marine mammals (Burghardt, 2019). Debate continues about the economic viability of offshore wind in Germany, especially after considerations of reduced subsidies have led to investor exits (Frohlingsdorf, 2013).

2.3 Environmental Impacts

The relationship between a project's environmental costs and community benefits is an interesting one. Firestone and Kempton (2007) found that negative environmental impacts played the largest role in overall opinion of the development of offshore wind in Cape Cod, MA. In a 2009 survey, Belgian residents and tourists were asked about perceptions of offshore wind both generally and in relation to localized development.

Researchers found that when residents were asked about which pieces of information they'd most like to receive about offshore wind, 56.5% said that information about the project's effects on nature and the environment were the most important. Second were costs and benefits (Degraer et al., 2013, p 33). Clearly defined and communicated community benefits, such as low-cost local power generation, had the most impact moving a resident from opposition to support (Firestone & Kempton, 2007; Haggett, 2011). If benefits are not clearly defined, then those surveyed in the Cape Cod case were unconvinced that the environmental impacts are worth the development (Firestone and Kempton 2007).

2.4 Visual Impacts

Multiple projects have been opposed by the public because of the potential visual impacts caused by wind farms (URI 2019; Davidson 2018). However, having a strong connection to the location in which a project will be implemented affects stakeholder's acceptance of the project even if they cannot see the turbines from their own home (Firestone et al., 2012). A common concern amongst stakeholders is that offshore wind development will deter tourism in coastal locations or decrease property values. According to the 2017 Goucher Poll, 11% of the 671 Maryland residents interviewed indicated that the offshore wind turbines would make them "less likely" to vacation in the coastal town of Ocean City (Groucher 2017). However, 12% said they would be "more likely" to vacation in Ocean City and three quarters of the interviewees specified that

seeing turbines over the horizon would “make no difference” to their decision (Groucher, 2017).

2.5 Economic Concerns

Lutzeyer et al. (2018, p 621) determined that individuals would not pay more to rent a vacation home with a view of turbines, and that rental values losses of up to 10% are possible for properties with utility scale wind farms within 8 miles of shore. However, the Block Island Wind Farm had positive economic impacts with regards to tourism. A recent study concluded that vacation rentals and revenue increased in the area from before construction (Carr-Harris A., 2019, p 51). Results indicate that property renters saw an average seven-night increase in their AirBnb bookings on Block Island during the tourist months of July and August, which relates to a $3,490 increase in revenue per Block Island rental property when compared to control cities. Despite this, the U.S. House Appropriations Committee adopted an amendment to the 2018 Interior Appropriations bill that would prevent the use of federal funds to assess project sites and construction plans for wind farms less than 24 nautical miles from Maryland’s shoreline (Delony, 2017). Congressman Andy Harris introduced the amendment because of fears that the two proposed wind farms, planned to be 12 and 17 nautical miles from Maryland’s coastline, would negatively impact tourism and property values.

Although studies indicate that wind farms may impact the renting prices and revenue of vacation properties, studies from the Lawrence Berkeley National Laboratory

(LBNL) show that there were no significant effects to property values that were within a 10-mile proximity of wind facilities (Hoen, et al., 2013). Furthermore, there was no statistical evidence that property values were affected during the post-announcement/pre-construction or post construction phases of each project. LBNL refined these results by working with the University of Connecticut to analyze the impacts of wind farms on property values in urban areas of Massachusetts (Atkinson-Palombo & Hoen, 2013). They determined that operating turbines near properties in urban areas did not impact their property values.

2.6 Place Attachment

Implementing wind farms in a community may disrupt or threaten the connection that community members have with a location or the association with their identity. Place attachment is the outcome of emotionally attaching oneself to a location. Place identity is relating one's self-identity to the physical and symbolic aspects of a location (Devine-Wright, 2009). Firestone et al. (2012) conducted surveys with community members close to the Cape Wind and Bluewater Wind projects located in Massachusetts and Delaware, respectively, to gather information about public acceptance of offshore wind through time. The results for opposition or support of the wind farms for people who live close to or would be able to see the project varied between the two communities. However, the feelings of place attachment (Cape Cod, 94%; Delaware Ocean are, 97%) and place identity (Cape Cod, 70%; Delaware Ocean are, 77%) were similar in both areas

(Firestone et al. 2012, p 15). They concluded that the location that one feels emotionally invested in is not necessarily where one lives, but may be the water the project is planned to be developed in. For example, the public may feel a weaker attachment to the open ocean than they do to enclosed or semi-enclosed areas, such as sounds and bays. Many researchers disagree about how these concepts fit in with larger 'Not in My Back Yard' reactions to localized development in general (Larson & Krannich, 2016). Regardless of the term, research is clear that people's relationship to their environment, and the ocean itself, can impact support or opposition for a project (Haggett 2011; Firestone et al. 2012; Devine-Wright 2009).

2.7 Fishing Impacts

A 2019 study by the European Maritime Spatial Planning Platform summarizing fishing conflicts concluded that the top concerns were damage to both the developers' equipment and fishing gear, re-distribution of fish, negative ecological and monetary consequences, and concerns about the longevity of the fleet both economically and culturally (European MSP Platform, 2019). The commercial and recreational fishing sectors are generally concerned that offshore wind farms may negatively impact their fishing operations, either by disrupting established fishing lanes, by directly removing productive fishing grounds, or by indirectly impacting fish behavior (Dalton, 2019).

2.8 Electricity Rates

As the development of wind farms continues, stakeholders are concerned with how project costs will impact their electricity rates. As renewable energy projects are developed, changes in the regulatory climate and scale can affect ultimate power purchasing agreements and consumer price (Sekularac, 2011; Trodson, 2018). Changes in price, especially when stakeholders were promised cheaper rates, can erode community trust long term (Falcon, 2018; Young, 2019). In response to residents' concerns that they would not be able to afford basic living expenses, such as food, rent, and medicine, because of the increase in their bills, the Newport City Council passed a resolution asking the Rhode Island Public Utilities Commission to explain the increase in the electric bills of mainland residents (Trodson 2018). Although stakeholders were concerned with higher electricity prices in this case, some portion of the population is willing to pay more for renewable electricity than they are for energy produced using fossil fuels (Leiserowitz et al. 2014; Farhar, 1999). Additionally, long term project needs, such as grid expansion and power usage, can also affect both ratepayers and developer's capital costs (Kerler, 2018).

2.9 Community Benefits Agreements

There are various forms of community benefits from offshore wind farms. Munday et. al. (2011) categorize community benefits as (1) "conventional economic benefits", (2)

"flows of financial benefits to local communities", including payments directly from developers, (3) "in-kind contributions to local assets and facilities", (4) "provisions of other local services", and (5) "involvement in the development process." Klain et al. (2017) identified potential community benefits from stakeholders in three different New England islands and included: community funds, community ownership, jobs, apprenticeships, studentships, and discounts on electricity.

Research shows that stakeholders expect different forms of compensations based on how strongly they were impacted by offshore wind development (Charlene et al., 2014). Stakeholders may expect compensation even when there is not a direct link to their perceived impacts from offshore wind development. For example, the hotel industry in one municipality desired compensation from the same tax revenue fishermen would receive in order to renovate their establishments and bring them up to code (Charlene et al., 2014). In England and Wales, authorities can set "Planning Obligators" that require monetary amounts from developers to address certain mitigation and infrastructure projects on existing infrastructure within a municipality (Aitken 2010). As noted in the case study examples above, community benefits can also include jobs or apprenticeships, project add-ons such as high-speed internet, and compensation to local entities (Klain et al. 2017).

While working with communities to develop co-benefits or benefits packages can have a positive effect on development, developers should be mindful about how to approach conversations about community benefits packages as a whole. Municipalities or communities geographically close to a project do not constitute all interested or affected

parties involved (Aitken 2010). Furthermore, to some communities and stakeholders, benefits packages can be seen as an inappropriate way to buy off local communities and ram projects through permitting processes (Bristow et al. 2012).

2.10 Offshore Wind and Native Tribes

Both federally recognized and non-federally recognized tribes play a role in development of offshore wind in the United States. Tribes have unique regulatory abilities to affect development. To start, the Advisory Council on Historic Preservation (ACHP) regulations, as required by section 106 of the National Historic Preservation Act (NHPA), require that tribes be consulted at every step of the development process (Suagee, 2010). However, statute does not "prohibit adverse effects" from occurring (Suagee, 2010). In addition, the Native American Graves Protection and Repatriation Act (NAGPRA) requires that a project be stopped if evidence of a burial site is found (Suagee, 2010).

Tribes can have important and long-standing relationships with the ocean and land areas that offshore wind energy development can take place, and can utilize these regulatory frameworks to defend their heritage. In the Cape Wind case, the Mashpee Wampanoag and the Wampanoag Tribe of Gay Head petitioned the federal government to declare that all of Nantucket Sound as a historic site due to their traditional "sunrise ceremonies" that would be impeded by the view of the turbines (Kimmell & Stalenhoef, 2011). While the Minerals Management Service (now BOEM) did find that the tribes had

a claim to viewshed concerns, they felt that the issue could be mitigated without listing all of the sound. Eventually, however, the MMS were overruled by the Keeper of the National Register and a contentious back and forth ensued until then Secretary of Interior, Ken Salazar, stepped in and allowed the project to go forward (Kimmell and Stalenhoef 2011). The total project delay due to the NHPA process totaled 18 months (Kimmell and Stalenhoef 2011). During the Rhode Island marine spatial planning process, the Narranganset Tribe worked with the state to provide relevant cultural resources information, including oral histories of the ocean and bay use (Mather et al. 2012). The Ocean SAMP was then utilized in negotiations and stakeholder discussions of the Block Island Wind project itself (Klain et al. 2017).

In her assessment of Tribal involvement in marine protected area planning processes in Washington and British Columbia, Singleton (2009) noted that "the prevailing assumption that all relevant 'stakeholders' can be jointly incorporated into a collaborative process is misleading, given that there are significant differences in legal rights and other political capacities among the various 'stakeholders'" She noted specifically that the political status of Tribes made it inappropriate to incorporate them in planning processes as just another stakeholder. The involvement of Tribes in the Marine Life Protection Act (MLPA) planning process was contentious until the development of a separate government-to-government consultation process led by the state (Rosales, 2011). Lessons from that process could be incorporated into planning for offshore wind.

2.11 Engaging Communities

Much of the research that has been previously conducted is situated after project completion. While it is useful to have stakeholders reflect on a process they have already participated in (Munday et al., 2011; Jeong et al., 2012; Bomberg & McEwen, 2012) it is also useful to assess community needs and thoughts before projects are completed.

Project developers in the United States, as noted above, have used a variety of strategies to successfully engage local communities, including utilizing collaborative marine special planning techniques, hiring local consultants, and facilitating mutual learning spaces where stakeholders feel heard. Klain et al. (2015) specifically recommend making mutual learning accessible from the very beginning as it allows for a place where communities can voice their concerns early in the project design process, where political and scientific knowledge can be shared and understood by all audiences, and where increased dialogue can lead to mutual understanding. Indeed, listening and incorporating concerns are key principles of public participation (IAP2 , 2018).

When community members are able to provide input on project planning, project outcomes are perceived as a fairer and the development process is seen as being more "open and transparent" (Firestone, et al., 2018; Ordonez-Gauger et al., 2018). The California Marine Life Protection Act implementation process is one example of trust playing a direct role on not only outcome support but also project legitimacy itself. Ordonez-Gauger et al. (2018) found that Northern California fishermen specifically had higher levels of satisfaction with the process if they had trust in the entity in charge. This

suggests that cooperative work with local entities (as is the case with Vineyard Wind) or at least hiring local consultants (such as the Block Island Wind Farm) might increase legitimacy and trust in the West Coast development process.

Many researchers, however, have pointed out that current mechanisms of bureaucratic governance in the United States do not allow for the kind of community projects and participation that many stakeholders would like to see. John Dryzek defines administrative rationalism as "the problem-solving discourse which emphasizes the role of the expert rather than the citizen or producer/consumer in social problem solving" (2012, p. 75). Current leasing and permitting processes post inherent challenges to more community-based renewables.

There are a wide variety of factors that affect renewable energy project development in communities (developer driven or not) including local benefits (Aitken 2010; Munday et al., 2011), state resources and polices (Allen et al., 2012; Bomberg and McEwen 2012), and community support (Jeong et al., 2012; Hingtgen 2006). Community ownership schemes have developed as a way to increase grassroots mobilization and local control, and influence community acceptance (Bomberg and McEwen 2012; Jeong et al., 2012; Bristow et al., 2012; Nolden 2013). There are several types of community-owned renewable energy projects, that can include everything from cooperatives, community charities (Walker G. , 2008).

Since communities can be far reaching and non-geographical (E.g an activity based community), developers have had significant discretion in how communities are conceptualized for ownership and benefit package purposes (Aitken 2010; Bristow et al.,

2012). This means that some communities that would like to get involved in a project may not be able about to do so based on varying definitions of the concept. In addition, if community benefits packages have been offered or negotiated, including partial ownership, there is often significant distrust by locals who sometimes see these offers as bribes or corruption (Aitken 2010; Walker et al., 2017). Even if strong community support for a project exists, because of the existence of benefits packages or otherwise, institutional and policy barriers may get in the way (Allen et al., 2012). In one study, developers felt that community-based projects were not scalable enough for state renewable goals, so they should not be emphasized on a policy level (Allen et al., 2012). Finally, research has found that some developers are not deterred by negative community response at all, suggesting localized variability can be a factor in project success (Barnett, et al., 2012).

Karena Shaw (2011) highlights these issues of state and developer driven, high-stakes renewable energy projects well in the context of Canada. Shaw documents renewable energy initiatives pursued by the Liberal government after the 2009 election, which included heavy privatization of energy systems and dam building. Shaw emphasizes that the projects, touted in the name of GHG reduction, worked to disempower communities and may have even promoted more emissions and habitat destruction than if smaller and more localized projects were pursed. The environmental groups that stood up to oppose these routes, she noted, “forced politics back into the conversation by situating energy policy within a wider context of environmental and

social justice struggles rather than allowing a ‘crisis’ of climate change to overrun these concerns” (p. 755).

While previous renewable energy research in both the United States and Europe is key in contextualizing current development, the research conducted in this thesis aimed to specifically fill the gap on the intersection of early stakeholder concern, bureaucratic processes, and forward-thinking conversations about climate change in the emerging context of offshore wind energy development in California. While there is a robust literature on these separate topics (outlined above) a nuanced discussion on the way these factors interact is important for real world application. Since the offshore energy space in the United States is still an emerging arena, this research effort is key to understanding success or failure of critical future development.

3. METHODS

In this case study I use semi-structured interviews, participant observation, and document analysis. All data were collected between February of 2018 and May of 2019 in California and Oregon. Data and subsequent analysis were obtained in collaboration with a grant-funded project by Humboldt State University's Schatz Energy Research Center. Grant funding was provided by California's Ocean Protection Council.

I used developed codes directly based off of the research questions and also based off of common responses. Question three and related themes about climate change were developed and added after data collection began as the topic became more prevalent in the findings. The research team selected 25 codes nested under three main umbrella codes: benefits, concerns, and process. These codes are based on both the research questions and preliminary thematic review of the data (see appendix 1 for a complete list of codes). The positives and concerns codes represent responses or comments that discuss positive or negative aspects of proposed development. Community benefits and process codes address specific discussions around potential developmental or monetary benefits of a proposed project (i.e. payments to fishermen or harbor dredging) and discussion on how that process is going so far or how it should work in the future, respectively. Finally, the climate change code represents all comments or discussion about the project in relation to climate change (i.e. a benefit of the project being to reduce local greenhouse gas emissions). Coding was done with Dedoose software. Each

interview was uploaded to the software and coded individually, line by line. Excerpts were then compiled and re-read for broad trends.

3.1 Semi-Structured Interviews

I conducted 22 Semi-structured interviews with 26 individual stakeholders across five groups: elected officials, environmental groups, labor, fishermen, and project developers (table 1). One stakeholder was formerly both a labor representative and a commercial fisherman and offered perspectives for both categories. Interviews lasted between 15-90 minutes and occurred at locations most comfortable for participants.

Stakeholder groups were selected by researchers and Schatz Energy Research Center for their association with proposed development of offshore wind energy development in Humboldt County. Immediate Association was determined by ocean user groups (E.g. fishermen) and those who might be involved in the building or permitting of the project (i.e. elected officials, labor, developers, and environmental groups). Association was also determined by which stakeholders have participated in existing ocean renewable energy projects around the world. While the term stakeholder itself is a contested term, this research uses ‘stakeholder’ to describe immediate participants who would interact with the process either during permitting, public meetings, or through lawsuits (Mitchell, Agle, & Wood, 2003). These stakeholder groups are not intended as an exhaustive listing of community members or entities that might be engaged in or impacted by a potential offshore wind energy project, but instead provide a snapshot into

local groups/communities that could be expected to play a significant role in the development process based on organization aims or participation of similar user groups on other projects.

Table 2: List of Interviewees

Stakeholder Group	Description	Interviewees (2018)
Government (GOV)	Elected officials and staff	4
Energy Industry (EI)	Developers, Consultants	5
Environment (ENV)	Local and state environmental non-profits	9
Fishing (FSH)	Commercial fishermen, retired fishermen, processor	7
Trade/Business (TD)	Local labor union/association leaders, business group leader	1

Tribal entities were not interviewed directly as ‘stakeholders’ due to their rights codified in state and federal law for government to government consultation on development projects on and off tribal land (Suagee, 2010). The specific rights of consultation coupled with other abilities to affect the development process of local projects (discussed in some detail in the next section) both make Tribal partners separate and apart from other user groups (for example fishermen who do not have these same abilities) and warrant a direct research analysis outside of the scope of this thesis. However, public documents and comment from local tribes was used, along with existing research, to describe tribal concerns and interactions with the development process.

Further research should be conducted to fully investigate tribal perceptions of offshore wind development in Humboldt County, including the holistic picture of past development injustices and continued occupation of traditional tribal territories.

3.2 Participant observation

I attended 14 public meetings and two industry conferences between February 2018 and May 2019 (see table 2). Meetings included 11 different hosts in 5 different cities. I paid particular attention to attendance, public questions and comment related to offshore wind energy generation, and the contents of host presentations. Meeting notes were transcribed and coded with stakeholder interviews to determine key themes and answer research questions.

Table 3: List of Meetings Attended

Date	Location	Host	Title
2/9/18	Eureka, CA	State of California	State of California General Plans Guidelines Update
3/13/18	Sacramento, CA	Pacific Ocean Energy Trust (POET)	California Offshore Wind Industry Summit
4/18/18	Eureka, CA	California Energy Commision (CEC)/Bureau of Ocean Energy Management (BOEM)	Offshore Wind Outreach Meet ‘n Greet

Date	Location	Host	Title
4/19/18	Blue Lake, CA	State of California/BOEM	Offshore Wind Outreach Meeting with Environmental NGOs
4/19/18	Eureka, CA	Humboldt Fishermen's Marketing Association (HFMA)	General Meeting, Meet and Greet with State of California and BOEM
4/20/18	Arcata, CA	CEC	CEC Integrated Energy Policy Report Workshop: North Coast Energy Perspective
6/27/18	Arcata, CA	Humboldt Baykeeper	Redwood Coast Energy Authority (RCEA) Update on Offshore Wind Energy Proposal
7/18/18	Arcata, CA	Northcoast Environmental Center	BOEM Leasing Process Informational Session
8/2/18	Eureka, CA	BOEM/CEC	Offshore Wind and Databasin
8/14/18	Eureka, CA	Humboldt County	EIR Scoping: proposed onshore wind farm at Bear River Ridge
8/20/18	Eureka, CA	RCEA	Monthly Board Meeting
9/18/18 – 9/19/18	Portland, OR	POET	Ocean Renewable Energy Conference
12/4/18	Eureka, CA	RCEA	Stakeholder Update Meeting
12/5/18	Eureka, CA	Humboldt Bay Initiative	Offshore Wind Energy Development
5/3/19	Eureka, CA	California State Senate Committee on Fisheries and Aquaculture	California Fisheries and Wildlife: Can they coexist with offshore wind energy development?
9/25/19	Eureka, CA	RCEA	Redwood Coast Offshore Wind Project Stakeholder Workshop

3.3 Document/Procedural Analysis

Document analysis includes materials from public meetings (presentations and agendas) as well as material from agency websites. Leasing and procedural information was obtained from the Bureau of Ocean Energy Management (BOEM) website and is utilized to answer questions about the process and stakeholder participation. These documents were used to described the leasing process and corroborate stakeholder interviews and meeting data.

4. FINDINGS

As communities begin to think about addressing and responding to climate change, serious questions emerge about how perceptions of a project and the development process intermingle with our shared desire to make positive change in our communities. This section outlines data findings on both the project and development process in general and describes stakeholders impressions about climate change in the development context.

4.1 Perceived Benefits of Offshore Wind Energy Generation in Humboldt County

All stakeholders interviewed discussed or were directly asked about their perceptions of offshore wind energy generation in Humboldt County, including perceived benefits and potential concerns (figure 2).

Stakeholders were asked to discuss both direct project benefits and possibilities for community benefits to be outlined in an agreement with developers. Many development projects, renewable energy or otherwise, include funding or other resources in what is often dubbed a ‘community benefits package’ (Aitken, 2010; Bristow et al., 2012; Walker et al., 2017). These packages can be a mechanism to ensure a community benefit outside of the direct project aims.

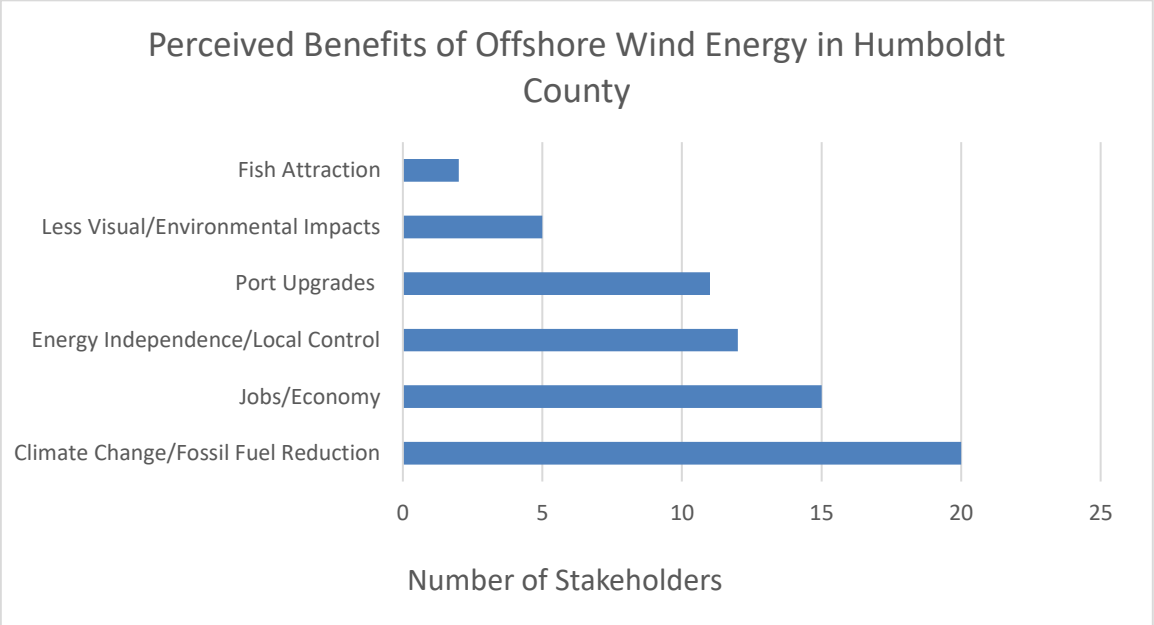

Figure 2: Perceived benefits of offshore wind energy development in Humboldt County. Most cited benefits include climate change and economic growth.

4.1.1 Fossil Fuels and Emission Reduction

Twenty out of 26 stakeholders interviewed cited renewable energy generation or moving away from fossil fuels as a direct benefit of proposed offshore wind energy generation in Humboldt County. Stakeholders felt that the project is an opportunity to move away from fossil fuels, pursue more renewable energy locally, and work to prevent the worst impacts of climate change. One stakeholder said explained that:

> "I think you know realistically I think it's reasonable…given the huge impacts of climate change and fossil fuels that, exploring and testing different technologies like this offshore wind is this is justified" (ENV 2 interview, 2018).

Another environmental stakeholder even said that, depending on who the developer is, she wished the project would be fast tracked. She said "it would be nice to treat this like a climate crisis…and make it happen sooner" (ENV 6 interview, 2018).

4.1.2 Jobs and Economic Benefits

Second highest (15 out of 26) was jobs and economic benefits. Stakeholders interviewed said that offshore wind would represent a new industry that could offer a perhaps more sustainable workforce that would benefit the county as a whole. Labor and trade interviewees said they were supportive and interested in a project as long as unionized labor is successfully negotiated and utilized. Put simply, one labor union leader said, "we're pro because we want to work on it" (TD interview, 2018). Labor and trade stakeholders said that they would be interested in working directly with developers to negotiate a project labor agreement where the use of union labor for the project would be laid-out, largely through attorneys. An offshore wind project, a labor stakeholder said, would increase membership and work hours for the community and could potentially lead to additional apprenticeship programs (TD interview, 2018).

Similarly, 11 out of 26 stakeholders interviewed cited potential port infrastructure upgrades as a benefit to the project. Fishermen who cited port infrastructure as a benefit agreed that the development associated with a wind project would potentially improve the harbor for all, including the likely need for dredging that new industry would require (FSH interviews, 2018). Additionally, dredging was also listed by fishermen as a stipulation in a community benefits package or MOU. In a 2018 meeting with the

Humboldt Fishermen's Marketing Association, BOEM was asked by several fishermen about benefits to the fishing fleet. BOEM emphasized that port improvements, dredging, and marine debris removal could be added to mitigation requirements on leases (HFMA meeting, April 2018).

At an offshore wind energy conference in Sacramento in 2018, Robert Collier, a scholar who studies labor, noted that the key is in the details—while there is promise for jobs generally, logistics such as local expertise really determines how many local and permanent jobs might exist with a project. He cautioned attendees to consider all the logistics in the matter, including the current state of the Humboldt port and costs for infrastructure upgrades—especially in light of past 'boom and bust' industries that have already affected workers in the area (California Offshore Wind Energy Summit, 2018).

4.1.3 Energy Independence and Local Control

Twelve stakeholders interviewed mentioned that Humboldt County leading the way on offshore wind energy itself was a positive. These interviewees were excited that their own local agency, the Redwood Coast Energy Authority (RCEA), is taking the lead and creating a potential framework for incorporating local concerns and benefits into the development process (stakeholder interviews, 2018). In an offshore wind meet and greet in April of 2018, Matthew Marshall with RCEA reiterated that local control of local resources was one motivation for the authority getting involved (CEC and BOEM public meeting, April 2018).

4.1.4 Community Benefits Agreements

Stakeholders interviewed also discussed what benefits they would like to see incorporated into a community benefits package. Perhaps the most vocal about the need for a community benefits package as it relates to project development were fishermen. Fishermen interviewed were careful to suggest that their discussion of benefits packages should not be taken as support for the project—their first preference would be for no development at all (FSH interviews, 2018). One fisherman explained this by saying that "if it comes out negative we're going to be against it. Regardless of its potential benefits to the community. We're not going to take a hit voluntarily so someone else can benefit" (FSH 2 interview, 2018). Another fisherman associated with the Humboldt Fishermen's Marketing Association said that "overall my job is to say no until we have further discussion and dialogue" (FSH 8 interview, 2018).

However, when asked to discuss what a package might include, fishermen overwhelmingly cited a general fund for fleet use. If a project moves forward, some fishermen said, then they should be compensated for their losses as a community, not individually (FSH interviews, 2018). One now-retired fisherman was clear that, "obviously we've got to get all these folks in line with the concept of: you pay to play. You're not here to just extract resources from us, even though that resource is this thing you can't see way off shore…do the right thing" (FSH 3 interview, 2018).

Ideas for what a compensation fund could be used for include: paying for mandatory safety trainings, federally regulated life-raft inspections, and "matching" funds to work with the city on development projects. The fund could also potentially be

helpful, fishermen said, in addressing the ice and cold storage issue (FSH interviews 2018). Fishermen use ice and cold storage to keep fish cold while at sea, and to store fish safely upon return to shore. One fisherman said that the last ice facility (which burned down and is no longer operational) was also paid for by a community fund (FSH 1 interview, 2018).

In terms of non-monetary benefits, fishermen say that they could also benefit from increased harbor dredging (needed for both their use and for the wind industry). The local fishing fleet is seasonally plagued with sediment build up and shoaling (which causes increased wave heights due to changes in water depth) in the bay channel and marina (Squier, 2019). In a public meeting in June of 2018, RCEA indicated that fishermen had discussed with them the possibility of using the offshore wind area for data collection and real-time fishing conditions (Humboldt Baykeeper meeting, 2018).

Individual payments to fishermen on their own, however, was not a popular idea among fishermen interviewed. Fishermen explained that the history of salmon disaster relief funds and other government money has caused long-lasting tension between fishermen who receive funds and those that do not (FSH 8 interview, 2018). This fisherman said that the problem “is that once you bring in compensation, with compensation comes a lot of animosity. It wouldn't necessarily be fair for everybody” (FSH 8 interview, 2018). Another fisherman also noted that individual payments to fishermen do not help with the long-term sustainability of the fleet (FSH 3 interview, 2018). This was echoed in a California State Senate Committee on Fisheries and

Aquaculture meeting where one panelist said that individual payments to fishermen really only amount to an early retirement check (May, 2019).

Four out of nine environmental stakeholders interviewed mentioned improvements to Humboldt Bay as something they would like included in a community benefits package. This included making cleaning up brownfield sites around the bay where pulp and paper mills used to exist. Other environmental stakeholders also mentioned the possibilities of EV charging infrastructure, job training, and more data on wildlife through project monitoring (ENV interviews, 2018).

Perhaps the biggest similarity between the fishing community and environmental stakeholders was their wariness about compensation from developers. Two environmental stakeholders mentioned that while additional money for local projects would be beneficial, it would have to be structured as an application and grant process rather than payments directly to local organizations or fishermen. Organizations would likely not accept payments from a developer over worries the money would be perceived as a bribe to move the project forward (ENV 9 interview, 2018). One stakeholder mentioned that her organization was criticized several years ago for accepting grant money from a company who was simultaneously working on an unrelated and controversial development project. The stakeholder said that the monies were in no way accepted in return for project support, but the appearance of a connection was unhelpful altogether (ENV 4 interview, 2018). As I note above, this is similar in the fishing community.

All developers interviewed acknowledged the importance of community benefits packages to the development process. One developer said that their existence "is a given...in any offshore wind project in the United States" (EI 2 interview, 2018). Another developer thought that entering into a memorandum of understanding (MOU) with the fishing community was the first step to proactively discussing a community benefits agreement (EI 1 interview, 2018).

One government stakeholder, however, was skeptical about the idea of including funding for development projects in a community benefits package. He wondered about the details of a project after money is obtained. For instance, who would run an ice storage facility? If an agreement is made for a developer to pay for dredging, what happens when the project is decommissioned and the developer leaves the area? He explained that:

> If energy prices drop, if something happens and the company goes belly up, then I don't know what…you would do then. I mean sure if they want to try and milk some money out of this project or…you know try to leverage some community, more community benefits than the ones that are already going to be happening because of the project, go for it. It's all in the negotiation. At some point you break it (GOV 3 stakeholder interview, 2018).

In any case, developers and elected officials thought that the Redwood Coast Energy Authority (RCEA) might be amply suited to act as a conduit between developers and local entities for the purposes of community outreach/benefits discussions and power purchasing agreements. An MOU between the local Humboldt Fishermen's Marketing Association and RCEA was indeed negotiated in 2018 in which the entities agreed to cooperate to identify potential impacts to the fishing fleet. This agreement states that

HFMA and RCEA will work together to identify and mitigate impacts and also to “seek out and cooperate as appropriate on mutually beneficial grant or public funding opportunities” such as bay and harbor improvements (Redwood Coast Energy Authority; Humboldt Fishermen's Marketing Association, 2018).

4.2 Stakeholder Concerns and Unknowns

While stakeholders list several potential benefits of the project, including reducing fossil fuels and providing increased jobs and resources to the community, stakeholders interviewed also had various concerns with offshore wind in Humboldt County (figure 3).

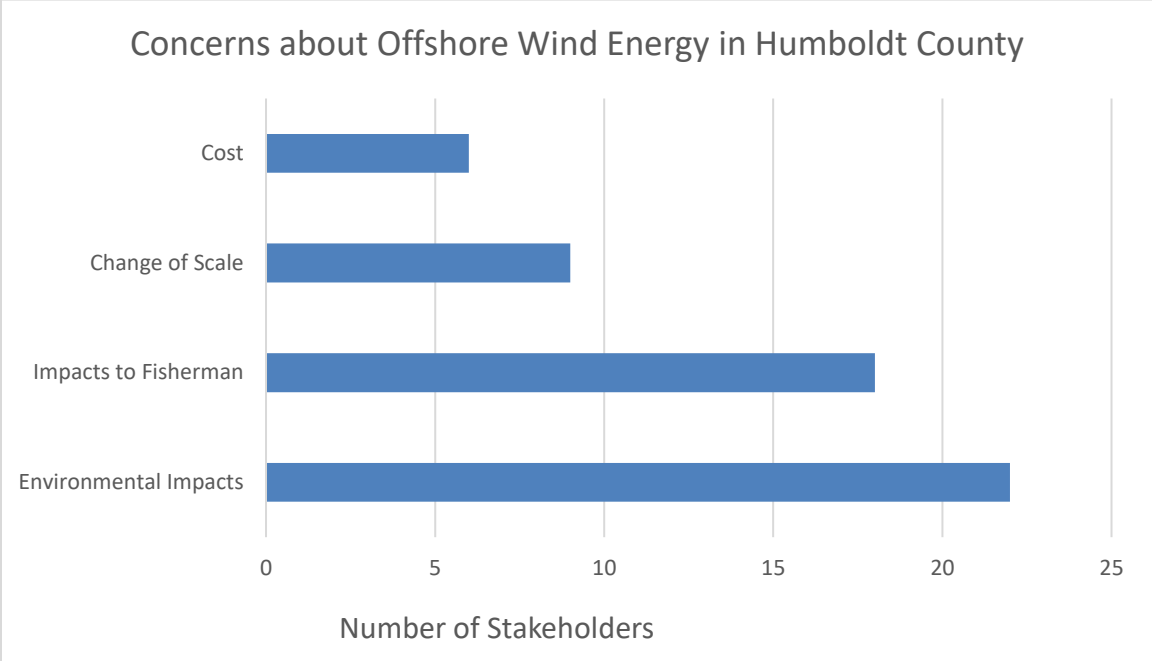

Figure 3: Concerns about Offshore Wind Energy Development in Humboldt County. Top cited concerns include environmental impacts and impacts to the fishing fleet.

4.2.1 Environmental Impacts

The most cited project concern among stakeholders interviewed was impacts to wildlife, including avian and mammal impacts (figure 4). Twenty out of 26 stakeholders, including eight out of nine environmental stakeholders, mentioned a concern for project impacts to wildlife. Additionally, seven stakeholders specifically listed whale entanglement as a concern.

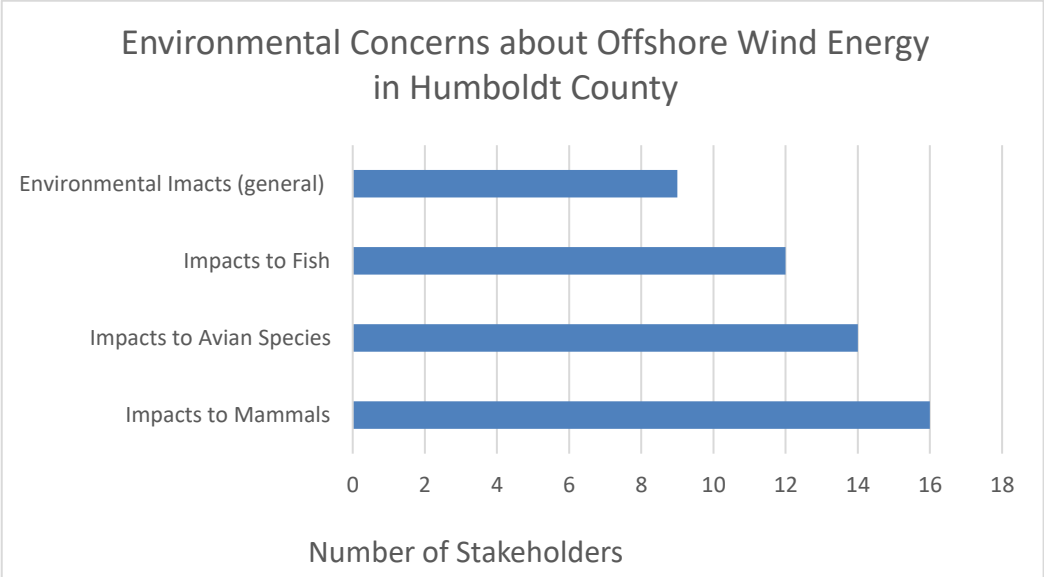

Figure 4: Perceived environmental concerns of offshore wind energy development in Humboldt County. Top environmental concerns include impacts to mammals and avian species.

Whale entanglement in California is a significant, albeit contentious, issue that culminated in a 2018 lawsuit by the Oakland Center for Biological Diversity which closed the crab season three months early in 2018 (Phillips, 2019). Fishermen specifically wanted clarification about who would be responsible if a whale gets entangled in fishing gear that has been collected in the mooring lines of the wind array (FSH interviews, 2018).

One developer interviewed did not see entanglement as a concern, arguing that the size of the mooring lines were too large to pose a risk (EI 2 interview, 2018). At an offshore renewable energy conference in Seattle in 2018, a presentation by graduate students attempted to address the entanglement issue by showing a simulation of a whale in the backdrop of the (indeed) very large mooring lines (POET conference, 2018). The

likelihood of significant debris accumulation, including stray fishing gear, leading to increased entanglement risk was not addressed in public meetings or by interviewees for this project.

4.2.2 Impacts to Fisherman

Fishermen and other stakeholders were concerned about the loss of fishing grounds for the local fleet, access in and out of the harbor, project impacts to their livelihoods, and to the behavior of and access to fish populations (stakeholder interviews, 2018). Eighteen stakeholders total out of 26, and every fisherman interviewed, were concerned about the loss of fishing grounds for the local fleet, including every fishing and energy industry stakeholder interviewed. Fishermen interviewed and in public meetings were overwhelmingly concerned about potential project impacts to their livelihoods and to the behavior of and access to fish populations.

In terms of the leasing area itself, several fishermen said that trawl fishermen, who fish near 600 fathoms[1] or more, are particularly impacted (FSH interviews, 2018). One fisherman said in a public meeting that there are "only four or five [trawlers] left" to begin with (HFMA meeting, April 2018). At a Humboldt Fishermen's Marketing Association meeting with BOEM in 2018, another fisherman said that "from a draggers point of view, there's no good scenario here" and said that the potential lease area looked like "it was drawn with a crayon" (April 2018). When fishermen asked BOEM in the

[1] A fathom is equal to 6 feet and describes the depth of water (Oxford Dictionary).

meeting about the status of fishing in a lease, they replied that the agency is not the one who “regulates fishing” and that fishermen would have to work that out with the developers or the state (April 2018).

Fishermen with other gear types would like to know what limitations will exist against fishing within a proposed lease area or wind array. If these lease area is deemed a no-fishing zone altogether, fishermen say a domino effect will occur where every fisherman could have their grounds impacted, and potential crowding or relocation may occur. Fishermen would also like to know how the subsea cable connecting the array to shore will impact their grounds. This includes both fishing near the cable and the cable’s effects on the fish populations itself, including vibrations or electric wavelengths that might be emitted. One fisherman said:

> They’re going to have to run a cable and if they say we don’t want you fishing over the cable then that’s further loss of grounds that will extend all the way to the shore. I don’t know about that (FSH 2 interview, 2018).

Two developers interviewed said that trawling or longlining within the array would be “tough” and said that they would have to be careful with their site selection from the start (EI interviews 2018). During public and private meetings, RCEA, BOEM and others have attempted to collect data to develop a call area with the least fishing impact to begin with, although it is not clear how the final map was decided based on fishing data (stakeholder interviews, 2018; public meetings).

Regardless of the lease area, fishermen are also worried about their access in and out of the bay and their gear storage and dock space. One fisherman said that bar conditions play a factor on when fishermen can and cannot navigate the bay channel. Depending on the tide, there may only be a short window to safely cross, either coming in or out. Increased boat traffic during these periods can be a major concern (FSH interviews, 2018). In terms of dock access, the Humboldt Bay Harbor and Recreation District's call for proposals to occupy Redwood Terminal 1 for the offshore wind industry has caused further consternation. One fisherman said in a 2019 public meeting that there is an ongoing battle between the fishermen and the Harbor District over access to Terminal 1. The fishermen said that the terminal is "100% occupied by the fleet" despite the district's attempt to solicit bidders for the site (California State Committee on Fisheries and Aquaculture, May 2019).

In addition, some stakeholders were skeptical that the offshore apparatus itself would stay moored in North Coast's rough seas, and could thus present a navigational hazard (stakeholder interviews, 2018). Fishermen mentioned the difficulty of keeping existing NOAA buoys in place, and wondered if the confidence of developers in their mooring lines was justified (stakeholder interviews, 2018). In addition to becoming a navigational hazard, turbines coming loose could also damage placed crab traps and other gear (FSH interview; HFMA meeting, April 2018)

Some fishermen feel that coming together to communicate concerns, or even to show up to public meetings can be difficult for them as a fleet. One fisherman said that: "Fishermen are notoriously independent. It's difficult to get five fishermen to agree on

where to go for lunch so we don't always speak with one voice let's say" (FSH 2 interview, 2018).

Fishermen would rather be fishing, not attending meetings, one fisherman associated with the fishermen's marketing association said in an interview. This fisherman said that "the realities are: the fishing industry needs some really bitchin' lobbyists" (FSH 3 interview, 2018).

4.2.3 Scale and Expansion

Seven out of 9 environmental stakeholders interviewed mentioned concerns about expansion of the local transmission grid to meet the demand of the project and to allow for exporting. One environmental stakeholder said that:

> …looking forward to what BOEM wants to do with like a max build out of the offshore wind resource, you know somewhere between 3 to 4 gigawatts of energy, that's going to require like, that would require a huge new…transistors and blah blah blah. I don't even know the terminology but you know we're going to need to have…more and bigger lines coming out of Humboldt County to serve that export energy market. So that…that's the other concern is, you know, how could it impact forests, how could it impact public lands? (ENV 9 interview 2018).

Stakeholders interviewed were also concerned about the scale of a project—both in terms of actual equipment impacts and potential future expansions of the technology. As noted above, fishermen and other stakeholder were concerned that the turbines and associated infrastructure would be too big for the bay and inhibit the use of other users. Interviewees again are say there were concerned about the environmental impacts of transmission and more and bigger infrastructure could be highly scrutinized, especially if

a land-based corridor is required for new power lines. One environmental stakeholder said that while they're positive about renewable energy locally, construction of on-shore infrastructure to export energy is a "whole other thing" (ENV 9 interview, 2018). Another stakeholder, a retired fisherman and labor representative, connected the weariness about scale to the boom and bust economy of decades past. He said he:

> Won't say the death of, but the great curtailment of a timber industry that ran roughshod over the community for a number of decades…we need to reinvent ourselves and maybe that reinvention really is that all industries are boutique here. We don't do anything on a big scale. And the one thing that we do have here that is on a big scale is making sure that we survive (FSH 3 interview, 2018).

One labor representative said that *not* having an expansion would be a negative since it would likely provide union jobs (TD interview, 2018).

4.2.4 Visual Impacts

Twelve stakeholders interviewed discussed the visual impacts of offshore wind and out of that only one stakeholder mentioned it as a personal concern. An additional three stakeholders worried about the public response to visual concerns, and lamented that the topic needed to be adequately addressed. The one stakeholder that was concerned about visual impacts connected the issue with the larger problem of ocean industrialization and wondered if we should treat the ocean like any other piece of used land onshore (ENV 7 interview, 2018). She said:

> I mean there's something so fundamental to how humans relate to and view the ocean especially somewhere where there is not a bunch of oil rigs you know and things already there. And to mar that vista in any way it seems like. Not to be like

> just romantic and poetic but I mean it does seem like it could have really a profound impact on people's ocean-going experience (ENV 7 interview, 2018).

Most stakeholders who mentioned visuals were either unsure of what the visual impacts might be or felt that the wind array would be too far offshore to be a big concern (stakeholder interviews, 2018). One government stakeholder said that:

> If people said 'oh you can't build this because it's going to block my view of the sunset' or something I'd say I'm sorry but that, that's not going to bother me whatsoever (GOV 1 interview, 2018).

A fisherman speculated that an offshore location would be ideal for developers who are avoiding visual impacts, however, "you don't want to tell a fisherman that that's why they're putting that project 20 miles offshore. Because fishermen…not only will they have to look at it, they have to dodge it" (FSH 4 interview, 2018).

4.2.5 Tribal Concerns

While tribes were not interviewed as stakeholders for the reasons listed above, there is public information regarding current concerns expressed in both private and public meetings. In a memo to Jean Thurston, the BOEM coordinator for the California Intergovernmental Renewable Energy Task Force, California Energy Commission Tribal Liaison, Thomas Gates, outlined key concerns that tribes have expressed in meetings regarding offshore wind energy development in Humboldt County. These concerns include:

- Religious and cultural importance of the ocean and viewshed;

- Effects to tribal resources, both biological and cultural, onshore and offshore, including burial and archeological sites and wildlife;
- Confidentiality and thoroughness of data collection;
- Impacts to offshore rock outcrops and geography;
- Long term impacts for future generations;
- Noise and vibration, especially as it impacts the sea floor and wildlife;
- Harbor development;
- And long-term monitoring and cyber attacks (Gates, 2017).

Federally recognized tribes are members of the intergovernmental offshore wind energy task forced formed by governor Jerry Brown in 2016. California is required to consult with non-federally recognized tribes as well, and an adjacent tribal task force has been created as an avenue to discuss concerns. During a 2018 trip to Humboldt County for offshore wind energy outreach, BOEM met with the Blue Lake Rancheria in a closed-door meeting. The discussions of this government to government meeting are not public. In addition to the concerns in common with interviewees, tribes had additional concerns about their experience with the development process so far. This is discussed in the next section on development.

4.2.6 Project Unknowns

While stakeholders and Tribes have listed various potential benefits and concerns, 8 stakeholders, including seven out of nine environmental stakeholders and one fisherman, emphasized the ‘unknowns’ that permeate offshore wind discussions. Several

environmental stakeholders noted that the challenges of the offshore location make it potentially difficult to do proper bird surveys. Ideally, interviewees say, robust surveys of birds in the leasing zone would help provide relevant information, such as species type and population, that developers and government agencies could use as an aid in project alternations and mitigation. With offshore lease sites, however, it becomes more burdensome to set up monitoring stations or in-person monitors. Standard practices, such as monitoring bird carcasses after project development, become almost impossible (ENV 5 interview, 2018). This sentiment can be described by one environmental stakeholder who said:

> Well it's just a big unknown. I mean we take a lot of things for granted because we don't see them. You know none of us see what's going on offshore, 20 miles out there. 10 miles out there. Only the people who are in boats really see that or in the air. But it seems on the surface like something that's got a lot of promise. And I'm excited about it, but we need to learn a lot (ENV 8 interview, 2018).

One developer interviewed took issue with the permeating idea that offshore wind technology is plagued with 'unknowns.' She said that a lot of times there are good data and other evidence that describe a particular issue, it just needs to be shared and discussed with the public. When discussing wale entanglement, she noted that "probably even though it seems like an unknown, I think we know enough that the likelihood of that happening is very very low…when people say everything's unknown it's like no, when you break it down we actually have some idea of…the likelihood of it being an issue" (EI 5 interview, 2018).

4.3 Stakeholders and the Development Process

Stakeholders were also asked about their perceptions about the offshore wind energy development process. This process includes the formal BOEM leasing processes and public meetings already conducted on the North Coast. The federal offshore leasing process is long and complex—and community involvement outside of standard public comment is not clearly defined.

4.3.1 Leasing Process

Significant federal involvement in the United States renewable energy sector comes from the Department of Energy (DOE). For offshore wind development and leasing, the Bureau of Ocean Energy Management (BOEM), a division of the Department of Interior (DOI), is involved. BOEM was created in 2011 out of the former Minerals Management Service (MMS) within the DOI. Intense scrutiny befell the MMS when the Deepwater Horizon oil rig exploded in the Gulf of Mexico. Regulators and the public heavily critizied the MMS for its conflict of interest as both a lease provider and a regulation enforcer and argued that the need for development overrode calls for safety (Urbina, 2010). As a response to the disaster and critisism, the MMS was split into two separate agencies: the BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) (BOEM, 2018). Both offshore renewable energy development and oil and gas production remain under the purview of the BOEM.

Current offshore wind energy developments in California will have to follow the BOEM leasing process which is similar to oil and gas leasing processes (Bureau of Ocean Energy Management, n.d). The process is a multi-year effort that either starts with an Unsolicited Lease Request or a Call for Information and Nominations (CIN) from BOEM itself. If an Unsolicited Lease Request is received, it is up to the BOEM to determine if competitive interest exists in the proposed leasing site. In the case of Trident Wind's 2016 request off the coast of central California, it was determined that other developers were interested in the site (Thurston, 2018). The presence of multi-party interest requires BOEM to organize a competitive auction for site control. To begin an auction process, wind energy areas (WEA's) are created after the Call for Information and Nominations, which allows developers to express interest in specific call areas. The public is notified via 'Sale Notices' and the highest bidder in the leasing process get the rights to lease.

A multi-factor auction process exists in the Code of Federal Regulations (CFR, Section 585.220(a)(4)) and is designed to allow BOEM to credit developers for non-monetary factors at auction. This can include the existence of a power purchasing agreement (PPA) or a community benefits package, among other things (Department of Interior, 2013). In theory, this mechanism could be used by RCEA and other smaller entities to compete by adding a 10-15% credit to the total bid value. This has been done successfully on a wind project off the coast of Rhode Island and Massachusetts. But while this mechanism has been used successfully in the past, there is uncertainty about the parameters of the non-monetary credit. On a case by case basis BOEM has authority to determine what the credit percentage is and what qualifies to trigger it. This discretion

leaves significant leeway to the agency itself, and to the White House, in determining the use and applicability of non-monetary credits (Studds, 2018).

This leads to extreme variability in the process, leaving locally based developers unable to plan adequately for auction credits. If smaller developers cannot necessarily rely on this credit, the auction becomes a simple 'highest bidder' process which can be inaccessible to most community based groups.

In Humboldt County specifically, the Redwood Coast Energy Authority (RCEA) preempted BOEM's Call for Information and Nominations by submitting its own unsolicited lease request three days prior. To start this process, they sent out a request for qualifications (RFQ) to select developers and consultants who would partner with them in submitting the Unsolicited Lease Request. The current partnership includes: Principle Power Inc, Aker Solutions Inc, EDPR Offshore North America LLC, HT Harvey & Associates, and Herrera Environmental Consultants Inc. This was done in an attempt to stake an early community claim in the process and work with stakeholders to move forward a renewable energy project that meshes with local community values (Marshall, 2018). However, BOEM decided to include the unsolicited lease request as part of their competitive process anyway.

If a lease is obtained, there are several other steps to accomplish before development can occur, including rounds of environmental review, permitting, and operations plan submissions to BOEM. In public meetings on the North Coast (2018), BOEM has emphasized the risks involved in navigating processes to obtain a lease. A

company for instance, might pay millions of dollars for a leasing site only to find out that environmental review is not going to work out in their favor.

4.3.2 Clarity and Transparency

Stakeholders expressed frustration with the process so far. One environmental stakeholder said that she wants to remain engaged and cares about the renewable energy prospect for Humboldt County, but she wishes that "their only resource isn't trying to navigate through BOEM's website and process and flow charts and you know all of that" (ENV 7 interview, 2018). Twelve out of 26 stakeholders specifically mention either confusion about BOEM's actions, or confusion about how RCEA and the local community fit into the process. A flow chart of the leasing process (described above) appeared in at least four of the 15 meetings attended. Despite this, stakeholders still expressed confusion about the process (public meetings, 2018).

One issue that was particularly confusing for stakeholders was RCEA's efforts to obtain an unsolicited lease request with a consortium of partners while the larger federal process was beginning to take shape. Four stakeholders, including three fishermen and one environmental stakeholder, were not sure who RCEA is in the first place, much less the complexities of who was trying to lease what (stakeholder interviews, 2018). Another fisherman said that while he knew that RCEA was attempting to obtain a lease, he had no idea that the BOEM process was different, and potentially much larger (FSH 5 interview, 2018).

4.3.3 Local Relationships

Some developers and other stakeholders interviewed were uneasy about the dynamic between local and federal entities, including between RCEA and BOEM. One environmental stakeholder said that she felt that BOEM was attempting to use RCEA outreach and meetings as their own outreach process, potentially even listing engagement with groups they didn't actually meet with (ENV 4 interview, 2018). Some attendees at public meetings were confused about who was hosting which meetings and for which purposes (e.g. RCEA local outreach versus BOEM community engagement). One incident involved a fisherman mistakenly addressing the federal government when the statement he was reading was for RCEA. One developer at this public meeting even suggested a public relations effort was needed to clarify the situation (BOEM and CEC public meeting, August 2018; EI 4 interview, 2018).

On top of the stakeholder confusion, there also initially appeared to be tension between RCEA and BOEM themselves. While RCEA has said that they are trying to be "good local hosts" for the federal government, stakeholders have sensed that perhaps BOEM had been wary about them attempting to pursue an unsolicited lease request instead of following the competitive process like everyone else (stakeholder interviews, 2018). Developers associated with the local consortium and RCEA said that they hoped that they could keep the scale small enough so that BOEM (and other developers) would not be interested in a competitive process (stakeholder interviews, 2018). Another developer said that BOEM would like to just stay in its comfort zone and follow the process they want to follow without addressing the local RCEA effort (EI 1 interview,

2018). At the Pacific Ocean Energy Trust's Portland Offshore Renewable Energy Conference in September of 2018, BOEM announced that RCEA's lease submission was going to be included in the regular competitive process. BOEM's representative, Necy Summait, stated that while RCEA was able to submit their request three days before the release of BOEM's competitive call, she was grateful that they could be included in the competitive process (Sumait, 2018). While RCEA wasn't able to convince BOEM to keep them in the unsolicited lease request category, the consortium is still pursuing a site under the competitive process.

4.3.4 Stakeholder Trust

Many stakeholders also said that BOEM was simply going through the motions and checking boxes on their to-do list rather than listening and incorporating community concerns into their meeting materials (stakeholder interviews, 2018). Some felt that it was hard to trust the federal government in general, much less the current administration (stakeholder interviews, 2018). One fisherman said that "it doesn't matter how many times we interview with BOEM. I ultimately feel as though…they will do whatever…they want to do in the ocean" (FSH 8 interview, 2018). An environmental stakeholder said that BOEM "can cross their T's and dot their I's and then just kind of forge ahead" (ENV 2 interview, 2018). Another fisherman was only convinced that BOEM would take local concerns into account as long as it doesn't interrupt their bottom-line (FSH 3 interview, 2018). When asked by the Humboldt County Fishermen's Marketing Association whether or not other stakeholders could participate in the

California intergovernmental task force process, BOEM confirmed that they could attend the meeting and give public comment, but they could not have a seat at the table due to federal law. One fisherman replied, “Everyone’s knows that if you’re not at the table, you’re on the menu” (HFMA meeting, April 2018).

4.3.5 Tribes and the Development Process

Local tribes expressed similar concerns about the development process in Humboldt County. In a memo to Jean Thurston (described in section 2.10), California Energy Commission Tribal Liaison, Thomas Gates, outlined key concerns that tribes have expressed in meetings regarding the development process.

To start, while BOEM is legally unable to work with tribes that are not federally recognized, California law requires the state to work with all tribes. In that vein, the state created a State Tribal Offshore Renewable Energy Working Group in 2017. Initial meetings with tribes before and after the creation of this group, however, ultimately included coastal tribes and not inland tribes. Participating tribes commented that inland tribes too have cultural and religious values associated with ocean development that should be taken into consideration (Gates, 2017). Further, tribes said that the function of the parallel group should be clearly defined with stated goals (Gates, 2017). As stated above, at least one Yurok tribal council member has said publicly that adequate consultation with tribes has not occurred (CEC public meeting, April 2018).

Additionally, while the Advisory Council on Historic Preservation (ACHP) regulations, as required by section 106 of the National Historic Preservation Act (NHPA),

require that tribes be consulted at every step of the process, statute does not "prohibit adverse effects" (Suagee, 2010). Tribes in state meetings have said they are concerned that by the time they are consulted, investment obligations will render their project comments moot in the first place (Gates, 2017). Mr. Gates also said that tribes would prefer to be involved, and provide input on, the construction process and mitigation measures (Gates, 2017).

Tribes also state they are interested in working with lead agencies on creating ""inadvertent discovery" burial agreements…prior to project construction" (Gates, 2017). The Native American Graves Protection and Repatriation Act (NAGPRA) would require that a project be stopped if a burial site was found (Suagee, 2010). Perhaps in response to a lack of teeth in the consultation regulations, tribes also said that they might consider registering certain sites as a state or national historic places, which would potentially stop or interrupt project siting (Gates, 2017; Suagee, 2010).

During a 2018 California Energy Commission Energy Policy Workshop, Vice Chair of the Yurok Tribe, Frankie Myers, said that he was unsatisfied with offshore wind outreach so far, and stated that there had not been tribal consultation by either BOEM or RCEA, stating that "even a postcard would be nice" (CEC meeting, April 2018).

While various meeting attendees throughout the two-year research period, including developers and representatives from BOEM, the California Ocean Protection Council, and the California Energy Commission, have mentioned the importance of reaching out to tribes, there was largely no tribal presence at public meetings attended.

This does not speak to non-public and behind the scenes government to government consultations that have occurred, although there are little public details of these efforts.

4.3.6 Positive Developments

Stakeholders did, however, list several aspects of the process so far that they deemed positive. For one, some in the environmental community appreciated BOEM's ability to elicit and employ biological experts and amass information in a centralized way (stakeholder interviews, 2018). One example is the California Offshore Wind Energy gateway, a site where stakeholders can view, upload, curate data on everything from annual landings to wale migrations. One environmental stakeholder personally knows one of the BOEM biological scientists and appreciated her involvement in the project (ENV 5 interview, 2018). Another environmental stakeholder said that BOEM was able to present offshore data that they couldn't obtain from RCEA (ENV 8 interview, 2018).

4.4 Climate Change and Renewable Energy Development

Behind the backdrop of potential project considerations and interactions with the development process, stakeholders addressed and considered how and when the impacts climate change should come into play. Stakeholders and public comment included references to the impacts of climate change on the ocean and the community, the need for decreased use of fossil fuels, and discussed how to bring those considerations into the fold. Twenty out of 26 stakeholders mentioned climate change or related key terms in

stakeholder interviews—despite there being no direct question on the matter. Climate change was coded on its own and combined with other codes including: crisis, urgency, seriousness, death, fossil fuels, carbon, and emissions. A majority of interviewees in each stakeholder group mentioned climate change or a related key word as a potential benefit for the expansion of renewable energy in Humboldt County.

4.4.1 Fishermen

The key group that did not reference climate change as a reason to support the project were fishermen. Only four fishermen out of seven mentioned climate change in their interview, and none of them referenced it as a reason to support the project in particular. One fisherman noted that "from a community perspective and just a citizenry perspective" offshore wind in Humboldt County is a way to advance energy independence and wean off of fossil fuels, but also said that "from a fisherman's perspective…it's a less than happy thing to do" (FSH 3 interview, 2018). Another fisherman noted that human impacts on the ocean environment, such as the threat from increasing water temperatures, domoic acid, and kelp die offs, are a serious threat that could potentially be abated by wind energy in general. The fishermen felt that the turbines, however, would be better suited on land (FSH 1 interview, 2018). In a 2019 public meeting, a fisherman with the fishermen's marketing association lamented that the community should not think that fishermen do not care about climate change, because they see the impacts "first hand" (RCEA public meeting, 2019). A third fisherman aptly

explained that there are so many factors outside of the fishing community's control that if they can have a say in protecting their grounds, they will. He said:

> I feel threatened…I love the idea of renewable and sustainable energy. But targeting the ocean is where I feel threatened because as a commercial fisherman, especially in this day and age, it's a constant uphill battle and the hill is getting steeper and steeper as the years go on. And we only have so much…we battle regulations, we battle the weather, we battle environmental factors, conditions that are beyond our control. So if there's ever anything that is within our grasp, within our control…no we would definitely want to have a say in it. So when I hear offshore wind energy, I think it's a great idea. Although, I'm very nervous about the location inevitably (FSH 8 interview, 2018).

One government stakeholder felt that the fishermen should recognize that our need to rapidly respond to climate change is a bigger danger to local landings than a wind array. He said:

> I hope they see that there's a lot of writing on the wall for them. That the fishing industry's not going to be around for much longer. You know? So we have to be radical (GOV 1 interview, 2018).

4.4.2 Government Officials

All four elected officials interviewed employed climate change as a reason to consider offshore wind energy development in Humboldt County. An elected official (the same one quoted above) lamented his concern and said:

> I'm trying to look at the big picture of things. We're…all literally going to be deeply affected…in the next hundred years…The average human in America creates 16 tons of CO2 a year. We're supposed to bring that down to less than 2 tons per year to avoid serious climate change incidents happening by the 2050. So we have to find ways as quickly as possible to reduce our carbon footprint and renewable energy for your home or car is...one of the easiest most attainable ways to do it (GOV 1 interview, 2018).

Similarly, this same elected official in another instance used climate change to try and persuade fishermen to get on board with development. The elected official said that:

> I'd have to share with them…you know the fishing industry is…already being challenged by climate change. You know we're facing species die offs left and right. So it's just one way or another. Their industry is going to be affected…We used to have one of the largest fishing fleets on the entire west coast here. But that has changed so much already over the decades with overfishing and fisheries not being able to rehabilitate themselves in time. The Fishing industry is in peril. There's a lot of writing on the wall for that. I hope they see that (GOV interview, 2018).

Another elected official was skeptical of the Bureau of Ocean Energy Management's involvement with leasing because his sense was that "BOEM, like every other agency in this administration, is sort of captive to the fossil fuel industry" (GOV 2 interview, 2018). At the same time, there was some positivity that development money could be used to advance other local carbon emission mitigation measures, such as EV charging stations (ENV 4 interview, 2018).

Finally, another elected official echoed developer concerns that impacts associated from climate change are not built into the development or permitting processes, and should be compared directly with project impacts (GOV 3 interview, 2018).

4.4.3 Energy Industry

Developers were perhaps the most uniform in their use of climate change as it relates to both renewable energy in general, and offshore wind in Humboldt County specifically. One developer felt that his role was to "provide help to the people who feel

some urgency about climate and the need to move this technology forward" (EI 3 interview, 2018). Whether discussing permitting hurdles or likely project impacts, multiple developers, and other stakeholders, lamented the fact that the negative effects of climate change are not factored into the development process (stakeholder interviews, 2018). Factoring in the impacts of climate change, for example, could be incorporated into environmental review and permitting processes so that that effect of doing nothing would be more apparent.

4.4.4 Environmental Stakeholders

Almost all environmental stakeholders (seven out of nine) mentioned climate change as a reason to move forward with renewable energy projects in general, but not explicitly as a reason to move forward with a specific project. Since some environmental stakeholders say they don't generally *support* development projects (they typically remain neutral or opposed), the association between climate change and support for offshore wind in Humboldt County specifically is murkier (ENV 9 interview, 2018). Indeed, recent opposition to an onshore wind project in Humboldt County shows that climate change as a factor for support is hardly the most prominent or salient factor for environmental groups (Waraich, 2019).

Only one environmental stakeholder was explicit about their organization's support for project development of offshore wind development in Humboldt County, noting that "it would be nice to just sort of treat this like a Climate Crisis…and make it happen sooner" (ENV 6 interview, 2018). That sense of urgency did not null all other

considerations (the same stakeholder who wanted more urgency in the process also supported a longer project time table to secure the right developer, particularly one with no ties to the fossil fuel industry).

Environmental stakeholders seemed to grapple between a concern for climate change versus project impacts. One stakeholder who was concerned about ocean industrialization and wildlife impacts conceded that "…if some project came up where it was… like a silver bullet, where it's like… this means that there will never be offshore oil drilling and we will all, you know climate change will be stopped. I mean we would probably will get on board with that. But you know short of that kind of thing…" (ENV 7 interview, 2018). As noted in earlier sections, many environmentalists were concerned about the 'unknowns' associated with the project and focused their responses more heavily on impacts and mitigation associated with proposed development locally. And while it is easy to imagine or acknowledge climate change on a national or international level, impacts from the warming planet still remain more amorphous at a local level. One environmental stakeholder said that it's hard to "know what's going on with climate change here…you hear a lot about the temperature regime, rain regime, and plants in the area, plant geography locally. Although…I really haven't heard much in the way of plant geography addressed here" (ENV 5 interview, 2018). Of course, some impacts, such as sea level rise, are less amorphous locally than others (California Coastal Commission, 2018).

4.4.5 Labor

Both of the labor stakeholders interviewed were perhaps the most unequivocal about support of development that includes union based jobs, regardless of climate considerations. A current local labor union representative interviewed said that if a project brings jobs--good-paying union jobs--then the unions will support it (TD interview, 2018). He said that gauging the rest of the community, they just wouldn't "accept" fossil fuel development so expansion in the renewable sphere is likely to be the most promising avenue for new job producers (TD interview, 2018). A former union representative reiterated this point when discussing a failed LNG natural gas project that was dropped in 2004. He said that labor was on board with the project, but negotiations with the fishermen broke down after Calpine, the project developer, failed to address concerns about port accessibility, among other things (TD interview, 2018).

5. DISCUSSION

Humboldt County stakeholders interviewed had specific perceptions about the potential benefits and concerns, as well as the development process, of offshore wind energy development. Data collected also show common themes related to the connection between local development of offshore wind energy generation and climate change. This analysis explores these findings and offers suggestions for future research.

5.1 Benefits and Concerns

Benefits cited by stakeholders in Humboldt County include clean renewable energy that provides local redundancy and elements of local control. Benefits also include the creation of a sustained renewable energy sector that could provide the community with jobs and other economic benefits, as well as with port and other infrastructure improvements. When discussing benefits packages, interviewees got a chance to put aside aspects of the project itself and imagine a future for Humboldt Bay, including discussions of ice and cold storage for industry, dredging of the bay and harbor, funds to help with the safety of existing vessels, EV stations, and environmental clean-ups. These ideas provide a glimpse into what stakeholders interviewed see as pressing issues that perhaps resources alone can fix. This exercise of envisioning benefits and needs, however, does not draw attention away from serious concerns.

Interviewees were concerned about the environmental impacts of an offshore project, including to mammals, fish, and avian species. Environmental stakeholders in particular wondered about the impacts of habitat changes for already stressed and vulnerable populations. Obtaining baseline data on these populations that far offshore (and then adequately monitoring impacts) poses its own logistical challenge. While, overall, developers were confident that concerns could be addressed and wildlife harm could be mitigated, details were not provided, especially since the project was so early in the process. While state and federal partners have helped setup the California Wind Energy Gateway for information sharing, there is skepticism among some stakeholders (namely fishermen) about the accuracy of that data, especially as it pertains to landings and other fishing data (HFMA meeting, April 2018).

Stakeholders were also concerned about the impact an offshore wind development project would have on the local fishing fleet. Concerns include the loss of fishing ground, harbor and bay access, and the effect of the equipment on fish themselves. This concern was voiced not only from the fishing community but also from every stakeholder group represented.

Other stakeholder concerns include changes in the scale of the project like more and bigger turbines, and any transmission upgrades that might occur, among others. What's more, the idea of unknown impacts gives many stakeholders, especially environmental stakeholders, pause.

These benefits and concerns are relatively in line with what we have seen with marine renewable energy projects on the East Coast and Europe. These similarities include:

- Particular emphasis on impacts on environmental concerns and impacts to the fishing fleet (NOAA, 2019; Cape Cod Today, 2019) (Firestone et al., 2012) (Degraer et al., 2013);
- Concern for changes in scale (Klain et al., 2015);
- Tribal concerns related to cultural heritage and viewshed (Suagee, 2010).

There are some benefits and concerns, however, that are not so expected based on past projects. To begin, there was a concern among some stakeholders that the deep-water offshore location creates more uncertainty (or, as some developers say, *perceived* uncertainty) regarding the wildlife and technological impacts than other renewable energy projects. As there is currently only one operational commercial offshore floating wind project in the United States, skepticism among stakeholders about unknown impacts is hard to shake and data is hard to discern from existing literature. What is clear is that developers should not ignore stakeholders' call for "unknowns" to be addressed and logistical questions to be answered. As other researchers have found, stakeholders are most concerned about ecological impacts, and receiving clear and timely information regarding those impacts is critical (Degraer et al., 2013; Firestone & Kempton, 2007).

Another divergence between the literature and project findings lies in discussions about visual impacts. Most stakeholders in Humboldt County who discussed visual impacts seemed to believe that the project was too offshore to pose a threat to the local

viewshed. Only one stakeholder interviewed mentioned visual impacts as a personal concern, and an additional three believed it would be a concern for others. This is not in line with other offshore fix-bottom projects in the United States, especially the Cape Wind project (Klain et al., 2017). Wildlife and viewshed impacts were among the top reasons for a complete reversal of public support for the Cape Wind project. Visual impacts were especially key in campaigns against the project (Phadke, 2010). While offshore wind in California is farther offshore than on the East Coast, little information has been disseminated on when the turbines will be visible, how often, and from which locations. As exact leases are obtained and details are finalized, seeing how and if concerns about visual impacts change will be key.

Lastly, another difference between other projects is the perception of economic benefits. Partly linked with visibility concerns, many stakeholders on the East Coast have been concerned that turbines would decrease property values and tourism in areas where the arrays are located (Lutzeyer et al., 2018). However, Humboldt County stakeholders listed local jobs and the economy as a benefit second only to reduced use of fossil fuels. Conversations about property values and negative economic impacts were relatively non-existent in data collected.

While there are many similarities (and a few key differences) between findings on the East Coast and Humboldt County, one thing that is clear is stakeholders need to see straightforward benefits that they can balance against any possible concerns or unknown impacts they might have (Firestone & Kempton, 2007; Haggett, 2011). Concerns about a potential offshore wind project in Humboldt County as listed by those interviewed

seemed to outweigh the benefits in number and in salience, especially when coupled with the discussion of unknowns. The development of other renewable energy projects in Humboldt County has been stalled or denied for similar reasons listed above. This includes the denial of the TerraGen project in December of 2019 (Greenson & Weinreb, 2019). For many stakeholders, especially those in the environmental community, the devil really is in the details.

5.2 Development Process

Straightforward conversations about benefits, concerns, and community benefits packages work within a complex regulatory and leasing process in a way that is similar to other development projects in the United States. Stakeholders and community members attended over 16 meetings in a two-year period in various capacities to receive and provide information on what a proposed project might look like. They grappled with the leasing process and the distinction between competitive and non-competitive efforts, and they have begun to understand both the regulatory and environmental landscape surrounding development. This early development process and stakeholder engagement is similar to developments on the East Coast—stakeholders have engaged in various capacities and will either work to shape the project to their own needs or attempt to defeat it if they feel their concerns are too great.

Most development projects in the United States involve a complex combination of state and federal law, environmental review, and regional permitting that can make or

break a project. Offshore renewable energy development involves some of the most complex laws and regulations, especially if a project transcends both state and federal waters. The environmental review phases could especially be more logistically difficult to carry out dozens of miles out in the ocean.

These leasing, environmental review, and permitting processes, however, are also the current mechanisms for public input and participation. Government decision makers are legally required to have some semblance of an open and public process when considering development projects. But in the engagement on offshore wind development in Humboldt County so far, stakeholders had already expressed confusion, suspicion, and meeting fatigue. A lengthy and complex process ultimately makes infrastructure development and decision-making inaccessible to an average community member who wants to weigh in on the process. Processes such as the Intergovernmental Task Force value the role of government affiliates, experts, and agencies, but leave no real room at the table for everyday community members who also have a stake in the outcome of project development.

The auction process also poses challenges for local input and community-based energy. Working off of a 'highest bidder' process makes it hard for smaller developers, and perhaps community-based projects, to get off the ground. Auction discounts do exist in the statute as an attempt to level the playing field for smaller developers. Credits (in the form of a dollar amount) could be applied to a developers' auction bid if the project includes some type of community benefit package. However, these discount credits are applied after an auction has been won.

These structural issues inhibit a robust and open public process—something data collected for this thesis show is a significant interest for stakeholders. Humboldt County stakeholders preferred the idea of some type of local control and a transparent process that would incorporate local needs. This desire is also in line with the development of other renewable energy projects (Klain et al., 2017). As already described, tensions between the federal effort led by BOEM and the efforts of RCEA show how difficult collaborations in the context of these regulatory frameworks can be.

Regulatory changes must be considered, especially reforming the lease auction process, that allow better collaboration on the development of offshore renewable energy projects as interest in such projects increase in the United States. Data from this thesis and past research clearly show the benefits of such a move.

5.3 Tribal Participation

While it is important to discuss participation and power in the development process of *all* stakeholders, it is key to emphasize and discuss the importance of recognizing and working with native tribes in the development process. The current public information available about tribal interactions with federal and state agencies seems minimal at best. Non-federally recognized tribes cannot participate in the intergovernmental task force, and at least one federally recognized tribe has spoken publicly about a current lack of consultation. While California has made significant efforts at including tribal partners despite federal constraints, more consultation and

public research should be conducted to adequately center tribes and tribal concerns in the development process.

This issue is key for all projects but especially in light of past failures in Humboldt County. As mentioned above, the TerraGen project was denied in late 2019 due largely to community concerns and a lack of tribal consultation. The Wiyot Tribe gathered dozens of supporters and tribal members to voice opposition to the project at a special Humboldt County Board of Supervisors meeting. In a deciding vote against the project, after two days of public testimony, Supervisor Mike Wilson ultimately voted no. He cited the fact that developers could not make accommodating arrangements for cultural impacts (Greenson & Weinreb, 2019).

5.4 Climate Change

Considerations of both stakeholder perceptions of offshore wind energy development and key issues with the development process itself are magnified by the ever-worrying presence of climate change—a fact that almost all stakeholders acknowledged. Stakeholders who mentioned climate change fell loosely into three categories. A small subset of stakeholders felt that the presence of climate change meant that an offshore renewable energy project should be supported and accepted. These stakeholders, which included some government officials, developers, and environmental stakeholders, felt that concerns about a development project were not as dire as climate change itself. A second group of stakeholders (namely fishermen) felt that the existence

of climate change (which they did not deny) was not a reason to disregard the impacts the of development project itself. Fishermen in particular did not think that it was equitable for them to be particularly disadvantaged. The majority of stakeholders, however, had not yet grappled with how to incorporate their concern about climate change with the details of a localized development project. These stakeholders felt that there are many unknowns, including how climate impacts are manifesting locally and how that would compare with project impacts.

Stakeholders were aware that continuing use of fossil fuel is not sustainable long term. That stakeholders acknowledge the existence of climate change does not mean they are not also concerned about local impacts of renewable energy development. This question hangs over not only the development of offshore wind energy, but a host of other local development projects such as infrastructure upgrades and business permitting. As communities grapple with the impacts from climate change, a balance must be struck between quickly moving away from fossil fuels in our transportation and energy sectors and ensuring that renewable energy projects are thoughtfully situated within the communities they serve. Communities themselves must have tough conversations about what development and mitigation looks like at the local scale.

The incorporation of climate change considerations in the development process is also key. The fact that these nuanced conversations about impacts from a changing climate are not actively compared to the impacts from a localized development project in the permitting and leasing regulations is a disservice to communities who are beginning to grapple with these very questions. As already noted, local government officials are

frustrated that there are currently very few avenues to have these formal discussions as a community and make informed decisions about project impacts.

As Karena Shaw (2011) notes, how governments make decisions about incorporating climate change into existing policy matters not only for a successful response but also matters in maintaining equitable decision-making. One step to having a regulatory process that incorporates both climate impacts and development concerns could be updating environmental review and permitting laws in the United States. Climate analyses in environmental review documents especially could begin to put climate planning and conversation at the forefront of community development projects. Not only would this help inform the development process, but it would also foster the continued public debate and community consideration of these concerns.

6. CONCLUSION

As society continues to grapple with transitioning to renewable energy under the cloud of anthropogenic climate change, tough conversations are necessary to describe the relationships between stakeholder perceptions, process, and climate change. In Humboldt County in particular, citizens will continue to wrestle with the institutional processes, complex regulatory procedures, and the many 'unknowns' of this new technological development. This Humboldt County case study will work to set the precedent of community involvement for the rest of the state, and time will tell what the process will end up looking like.

While stakeholders in Humboldt County vocalized a concern about climate change, it's not clear exactly how they should factor it into their decision-making processes and when. It's also not clear who should bear the cost of new renewable energy development, and how. How much, for instance, should the fishing community suffer a loss of territory when they already suffer a loss of healthy oceans? If anything is clear, tough conversations at the local levels where development takes place are key to our broader energy transition.

How and when stakeholders and communities are included in development processes can have a significant effect on ultimate project success. In the case of offshore wind energy, stakeholders had various concerns ranging from biological impacts, to viewshed concerns, to loss of fishing ground. A process that allows stakeholders to feel heard, a process that is flexible to change based on feedback, and a process that includes

trustworthy actors is pivotal in addressing these concerns. Projects already underway, as well as projects that have been unsuccessful, have shown that more than technology is needed. What is needed is open ears and flexible and collaborative processes that keeps everyone engaged and allows everyone to be heard.

Robust conversations are already occurring in climate governance circles that aim make explicit connections about how climate change planning and mitigation interacts with the local. More research is needed to discover what people are willing to give up, and when, for localized development projects. Further research in the Humboldt County context should place particular emphasis on vulnerable populations and tribes. While centralized development of oil and gas production is widely regarded as a negative, similar conversations about centralized, top-down approaches to renewable energy governance and climate change are needed now more than ever. While there is no dispute that we need to transition away from fossil fuels, stakeholders in Humboldt County have reiterated that it is *how* we transition away from fossil fuels that matters just as much.

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APPENDIX

Appendix 1: List of Interview Codes.

- Benefits
  - Community Benefits Package/Payments
  - Energy Independence/Local Control
  - Jobs/Economy
  - Other
  - Port Upgrades
  - Reduce Emissions/Climate Change
- Concerns
  - Cost
  - Environmental Impacts
    - Birds
    - Fish
    - Land-Based
    - Land-Based Transmission Upgrade
    - Marine Mammals
    - Mitigation
  - Impacts to Fishermen
  - Other
  - Scale/Change of Scale
  - Visual Impacts
- Process
  - Clarity/Transparency
  - Hopes for Process in the Future
  - Local Relationships
  - Meetings/Stakeholder Outreach
  - Other
  - Siting/Location/Scale
  - Trust
- Climate change
  - Climate change
  - Crisis
  - Urgency
  - Serious or seriousness

Death or dying
Fossil fuels
Carbon
emissions