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INDICATORS OF SOCIAL ACCEPTANCE OF OFFSHORE WIND ENERGY DEVELOPMENT IN MASSACHUSETTS: ASSESSING THE COMMONWEALTH'S CURRENT SOCIO-POLITICAL, MARKET AND COMMUNITY CONDITIONS

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INDICATORS OF SOCIAL ACCEPTANCE OF OFFSHORE WIND ENERGY
DEVELOPMENT IN MASSACHUSETTS:
ASSESSING THE COMMONWEALTH'S CURRENT SOCIO-POLITICAL,
MARKET AND COMMUNITY CONDITIONS

BY

JAMIE BUCK

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF ARTS
IN
MARINE AFFAIRS

UNIVERSITY OF RHODE ISLAND

2019

MASTER OF ARTS IN MARINE AFFAIRS THESIS

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2019

ABSTRACT

Harnessing wind offshore is an increasingly prevalent form of renewable energy production. For these large offshore wind farms to be successful, there must be a reasonable level of social acceptance for the developments. There is a great deal of research around how to measure social acceptance of renewable energy developments, but as of yet there has not been a large, utility-scale offshore wind farm in the United States to examine. This study uses a well cited framework created in 2012 by researchers Sovacool and Ratan to measure levels of social acceptance in Massachusetts of the proposed Vineyard Wind development, which is an 800 megawatt offshore wind farm that has agreed to sell power to the State of Massachusetts.

Findings from this study show that while the framework proves a useful tool for measuring levels of social acceptance, some categories lack applicability to large-scale offshore wind in the U.S. This is particularly apparent with regard to the role of national versus state policy and support, the dearth of community or individual ownership and/or control, and the insufficient analysis of opposition opinion. While key informants of Massachusetts have a net positive view of the proposed Vineyard Wind project, this support is nuanced and multi-layered. This study highlights the fact that separating individuals into one of two categories - supportive or resistant - does not accurately represent the truth and woefully oversimplifies a complex topic.

This study utilized a qualitative method of data collection through a series of semi-structured interviews conducted through the Spring and Summer of 2018. These interviews provided data which could then be coded and sorted into the categories defined by Sovacool and Ratan. This analysis helped identify indicators and evidence of support that were used to assess each section of the framework and determine if and how well a specific criterion was met.

ACKNOWLEDGEMENTS

First and foremost I wish to thank my advisor, Dr. David Bidwell, for his support, understanding and patience throughout this study and the entirety of my graduate career - your help has been immeasurable. Thank you as well to the rest of my thesis committee; Dr. Tracey Dalton and Dr. Simona Trandafir, and to my Defense Chair Dr. Gretchen Macht. I would like to thank all the participants of this study for taking the time out of their busy schedules to talk with me. Finally I want to thank my family and close friends who encouraged me when I needed it and comforted me when I felt overwhelmed - without you all none of this would have been possible.

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CHAPTER 1

INTRODUCTION

Climate change is in the global spotlight now more than ever. One hundred and eighty-five nations have ratified the Paris Climate Agreement (“Paris Agreement | Summary & Facts” Britannica, 2019), and although the United States has signaled its intent to pull out, twenty-five States and Territories have come together as part of the United States Climate Alliance pledging to meet (and in some cases to surpass) the Convention’s goals to reduce greenhouse gas emissions (U.S. Climate Alliance). The National Climate Assessment cites the burning of fossil fuels as one of two primary causes of modern day climate change, the other cause being the clearing of forests (National Climate Assessment, 2014).

The adoption of renewable energy technologies is a central element in international and national mitigation strategies and plans for lowering emissions (UNFCCC, 2017). In the United States, wind energy production is a rapidly growing industry and is expected to surpass hydroelectricity to become the largest renewable energy source in the country (Energy Information Administration, 2018).

Offshore wind farms have been being developed outside the U.S. since 1991, and in the decades since, the industry has ballooned, with Europe leading the charge (Arapogianni et al., 2011). One of the main reasons for this increase in the prevalence and popularity of the technology is that siting these projects out at sea allows for much larger turbines which can harness far more energy than their terrestrial counterparts.

This allows the developments to produce vast amounts of clean energy and gives governments a powerful tool in their efforts to lower GG emissions (National Offshore Wind Strategy, 2016).

Despite the fact that the east coast of the United States - in particular the northeast region - has been determined to be a highly productive area for harnessing wind power (National Offshore Wind Strategy, 2016), the United States had abstained from building any offshore wind developments until 2016, when a small scale five-turbine wind farm was built in Rhode Island state waters.

Since then, the industry has begun to gain traction. The Federal Government had already begun to designate lease areas (see Figure 1.1), but there was an uptick in state activity up and down the East Coast, and winning bidders have since begun entering into power purchase agreements with states (Lease and Grant Information | Bureau of

Figure 1.1: Federally designated lease areas for offshore wind development on the eastern USA.
Source: Business Network for Offshore Wind

Ocean Energy Management), and companies are opening regional offices to integrate themselves into this burgeoning United States market (Mass CEC).

There is clear enthusiasm among legislators in the northeastern region of the United States; New York State alone is supporting the development of 9,000 megawatts of offshore wind energy by 2035 (NYSERDA), while Massachusetts has declared itself to be at the forefront of offshore wind development and is currently moving forward with plans to develop the first large scale offshore wind farm in United States Federal Waters (WBUR, 2018).

Given the fact that the United States has held out for so long and is now poised to enter the global market as a major player, there is a lot of pressure for the country's first utility scale development to be successful. Failure has the potential to set the United States back in a big way, especially given the country's lukewarm history of support of renewables (Sovacool and Ratan, 2012). It is well documented and widely understood by now by social scientists, researchers, and analysts of wind energy in particular that social acceptance is crucial for true success of renewable energy developments into existing energy markets (Bidwell, 2017, Szarka, 2006, Wüstenhagen et al., 2007).

This study uses a widely cited framework for assessing social acceptance of renewable energy technologies to examine the upcoming offshore wind energy project in Massachusetts known as Vineyard Wind. The goals of this study were: 1) To assess levels of acceptance in MA per the framework both with respect to the Vineyard Wind project and offshore wind energy in general, 2) To determine if this framework can be

effectively used with respect to the Vineyard Wind development, and 3) To provide early insights into whether or not this framework can be effectively used with respect to utility-scale offshore wind developments in general.

Findings from this study show that the framework overall is a well-designed and useful tool for measuring social acceptance of the Vineyard Wind development among key participants. That said, there are aspects of the framework that didn't translate particularly well, including: 1) the duality of national and state governments in the United States and their inconsistent policies and levels of support for renewables, and 2) a lack applicability to utility-scale offshore wind farms as compared to more community based terrestrial projects. Furthermore, there were aspects of the framework which were identified as being problematic as they are currently written, including an overall failure to acknowledge a sliding scale of support.

CHAPTER 2

BACKGROUND

2.1 CONTEXT

In 2007, Dr. Rolf Wüstenhagen and colleagues published “Social acceptance of renewable energy innovation: An introduction to the concept” (Wüstenhagen et al., 2007). As it was explained by the authors, this article was written during a time when many countries were ramping up energy production using renewable resources. This article states that there was an urgent need at the time for public opinion and social acceptance of renewable energy development to be taken much more heavily into account than what was the trend among countries at that time. Wüstenhagen et al. paid special attention to public opinion surrounding terrestrial wind energy developments, explaining that at the time the visual impact of turbines was a hotly debated subject in many countries. The article laid out three categories of social acceptance for new renewable energy infrastructure: socio-political, market, and community.

Socio-political:

The strength or lack thereof of a State or Nation’s institutional capacity may serve either as a major catalyst or a powerful impediment to the undertaking. For any large-scale project to be built in the first place, there must of course be at least a minimal level of political support, even it is simply in the form of mere tolerance. Beyond this, political scientists and researchers offer the perspective that policy makers are some of the most relevant actors, and that their political behaviors and decisions can have the

greatest impacts (Dermont et al., 2017, Wolsink, 2000). True socio-political support must come from proactive and comprehensive policies, ideally developed using a well-reasoned and carefully executed process (Dermont et al., 2017).

Market:

Governments must have economic policies which allow for programs or incentives that facilitate smooth integration of renewable technologies into the existing market system (Green and Vasilakos, 2011, Wüstenhagen et al., 2007). In order to create true market acceptance, these policies should ideally be informed by fiscal projections based on comparable ex-post analyses (Brown et al., 2012, Xia and Song, 2017, De Silva et al., 2016) which help to inform overall economic impacts (Slattery et al., 2011). Economic analyses are vitally important tools which can help coordinate governmental interests with public interests and budgetary constraints (Green and Vasilakos, 2011). There should also be a robust domestic supply chain, both in order to grow national workforce, but also to reduce reliance on imported goods (Slattery et al., 2011).

Community:

While socio-political acceptance considers the viewpoints of politicians and existing legislature, and market acceptance looks into economic integration and healthy competition of renewable technologies, community acceptance focuses primarily on the micro rather than the macro level and prioritizes the opinions of regular denizens and taxpayers. It has been well established that community

acceptance is vitally important in overall social acceptance of renewable energy technology developments (Wüstenhagen et al., 2007, Aitken, 2010, Bidwell 2013). Communities play host to the actual infrastructure, and without the support of inhabitants and users of the space, there is a decreased chance that locals will be willing to host the proposed development (Devine-Wright et al., 2017). The idea that most objection comes in the form of the “Not In My Backyard” (or NIMBY as it’s more commonly referred to as) is one that is being phased out by social scientists (Wolsink, 2000). While it is tempting to assume that any opponent of a wind energy development in their community possesses this NIMBY mindset, it’s been proven that opposition often comes from a wider array of dissenters, and that the “social gap” between general acceptance of wind energy and actual development of projects can often be attributed to groups or individuals trying to protect specific sites from development (Bell et al., 2005, 2013, Bidwell 2016). Specific site opposition may be based on concerns including but not limited to over the natural environment, the historical significance of the site, concerns over accessibility to the area.

2.2 FRAMEWORK FOR MEASURING SOCIAL ACCEPTANCE

The 2007 article written by Wüstenhagen et al. was integral in the formalization of “social acceptance” as an area of study with respect to renewable energy, and the three-tiered backbone of socio-political, market, and community acceptance became a tool commonly used by subsequent researchers (Gaede & Rowlands, 2019). Five years after Wüstenhagen et al. published their seminal article, researchers Sovacool and

Dimension	Criteria	Explanation
Socio-political	Strong institutional capacity	Countries exhibit institutional support at the national level through ministries or departments of energy with specific programs or subsectors dedicated to renewable energy, or have government sponsored institutes doing research on renewable energy
Socio-political	Political commitment	Political leaders make promoting renewable energy a highly visible topic
Socio-political	Favorable legal and regulatory frameworks	Laws and regulations facilitate easy of entry into the renewable energy market, independent renewable energy producers (even homeowners) are granted access to the electricity grid, national interconnection standards exist, and regulatory changes occur in a predictable and transparent manner
Market	Competitive installation/production costs	Renewable energy technologies can produce electricity at a competitive rate compared to other sources of supply, driven by government incentives, a large resource endowment, and/or a strong local manufacturing base
Market	Mechanisms for information and feedback	Investors and users/producers have access to reliable information about renewable energy policies, prices, and opportunities
Market	Access to financing	Producers, manufacturers, and users have access to domestic sources of low cost financing and/or can benefit from specific government financing schemes
Community	Prolific community/individual ownership and use	Renewable energy systems tend to be installed, owned, and/or used locally
Community	Participatory project siting	People and communities are involved in the decision to site or permit renewable energy facilities near them
Community	Recognition of externalities or positive public image	Community members are generally aware of the environmental impact of conventional energy and the benefits of renewables, cultivating a strong public image

Table 2.1: Framework for Measuring Social Acceptance of Wind and Solar Electricity Developments.
Source: Sovacool and Ratan, 2012

Ratan published a paper titled “Conceptualizing the acceptance of wind and solar electricity” (Sovacool and Ratan, 2012), which expanded upon Wüstenhagen et al.’s framework. This article proposed three conditions within each of the three categories for a total of nine criteria (see Table 2.1). The goal of the researchers was to provide a checklist of sorts that could be used to assess levels of social acceptance of a renewable energy development; in other words, meeting more criteria would indicate a higher level of acceptability of the development. The researchers state that their belief that all or most of their nine criteria must be met in order to ensure a seamless web of socio-political, market, and community acceptance.

Under the socio-political category, the three criteria are: 1) Strong institutional support, 2) Political commitment, and 3) Favorable legal and regulatory frameworks. These criteria aim to assess how receptive the governmental structure is to renewable energy in the location where the development is located. Designated branches of government along with supportive legislators and favorable laws or regulations are some of the indicators of socio-political acceptance.

The three criteria under the market category are: 4) Competitive installation / production costs, 5) Mechanisms for information and feedback, and 6) Access to financing. These criteria aim to assess how well the development will integrate into the economy in the location where the development is located. Governmental incentives and financing schemes are examples of indicators of market acceptance.

Lastly the three criteria under the community category are: 7) Prolific community or individual ownership and use, 8) Participatory project siting, and 9) Recognition of externalities or positive public image. These criteria aim to assess how relevant stakeholders in the location where the development is located feel about it. Local ownership, an influential voice in the planning process, and predisposition to renewable energy are some of the examples of indicators of acceptance at the community level.

Sovacool and Ratan tested this framework on four case studies: residential solar photovoltaic (PV) in Germany, residential solar PV in the United States, terrestrial commercial wind energy in Denmark, and terrestrial commercial wind energy in India. This article has gained a reputation of being authoritative with respect to social acceptance of renewable energy development in the field of social sciences (Devine-Wright et al., 2017).

2.3 CONTEXTUALIZING OFFSHORE WIND IN THE UNITED STATES

Offshore wind farms have been developed since 1991, with the first utility scale project installed in 2001 in Danish waters (EWEA, 2011). Since 2011, Europe has

been the frontrunner in offshore wind energy production; as of 2018, Europe had 4,543 grid connected offshore turbines for a total of 18,499

megawatts (WindEurope, 2019). Aside from Europe, China has also become a major player in the offshore wind market. Figure 2.1 shows, by country, the capacity in megawatts per country as of 2017.

With all the successes the offshore wind industry has had over the past two decades, there has been a stark lack of development in the United States. The only offshore turbines in the US are the five of the Block Island Wind Farm, a 30-megawatt development located off the coast of Block Island, RI, completed in 2016. This small-scale pilot project came to fruition for a multitude of reasons including strong gubernatorial support (BusinessWire, 2008), a collaborative planning process with the Block Island community (Klain et al., 2017), and the promise of benefits including an end to diesel powered electrical generation on Block Island (EcoRI News, 2017). Most notably however, the project stayed entirely within RI State waters. As of today, there are still no large-scale offshore wind developments in United States waters. In a 2009

Category	Barrier	Explanation
Financial and market impediments	Information failure	Producers do not distribute accurate or readily available information about renewable power projects. Consumers lack information about renewable power technologies, a trend exacerbated by transaction costs and "bounded rationality". Real-time electricity costs are masked through customer aggregation, average billing, and regulated rate plans.
	Returns on investment	Homeowners lack available capital or access to it to purchase renewable power technologies. A large gap exists between private and social discount rates energy investments. Consumers, businesses, and utilities are more concerned with "first costs" than "lifetime costs".
	Split incentives/principal-agent problem	Builders make energy decisions for homeowners. Landlords make energy decisions for tenants. Businesses remained focused on core missions and maximizing profit. Fiscal or regulatory policies discourage energy efficiency. A limited supply and availability of energy-efficient technologies exists.
	Predatory market power	Strenuous interconnection requirements and stranded costs prevent access to the grid. The intermittent nature of some renewable resources convinces utilities that they are ill suited to provide base-load and peaking power. Intellectual property rights, patent blocking, and patent suppression are used to prevent entry into the industry.
Political and regulatory obstacles	Flawed expectations	Early renewable power advocates had inflated hopes and expectations.
	Variable and inconsistent incentives	Renewable power programs and subsidies, such as the production tax credit, were allowed to expire or never fully implemented.
	Varying state standards	State programs have differing and sometimes contradictory definitions, standards, goals, and requirements for renewable power.
	Underfunded R&D	Public funding of R&D has declined precipitously since the 1980s. Private funding of R&D has been reduced as utilities and energy companies consolidate and restructure for competitive electricity markets.
	Bureaucracy	A "top-down" approach to energy R&D plagues DOE programs on wind and solar.
Cultural and behavioral barriers	Public apathy and misunderstanding	People remain uniformed and apathetic about electricity technologies and express preference for familiar energy systems.
	Consumption and abundance	Historical antagonism towards nature, industriousness, industrialization, and the promotion of leisure have resulted in values predisposed towards excess energy consumption and waste.
	Psychological resistance	Comfort, freedom, control, and trust are prioritized more than energy conservation and renewable power use.
Aesthetic and environmental challenges	Environmental costs not included in the price of power	Consumers cannot make rational comparisons between conventional and renewable power sources.
	Environmental objections to renewable power technologies	Renewable power technologies are believed to be aesthetically displeasing and to harm the environment and degrade land and property.
	Symbolism	Renewable power technologies can symbolize distrust in government or a clash between rural/urban and rich/poor constituents.
	Internal fighting	Renewable power technology firms fight amongst themselves instead of coordinating policy.
Table 2.2: Barriers to development of energy efficiency and renewables in the United States. Source: Sovacool, 2009)		

article, Sovacool examined major impediments to energy efficiency and renewable energy in the United States. Table 2.2 details his findings.

2.3.1 CAPE WIND

This is not to say there have not been efforts to deploy offshore wind energy in the U.S, the most notable of which was Cape Wind (Firestone et al., 2018). Beginning in

2001 and continuing for over a decade, Cape Wind Associates LLC (CWA) fought to create America's first offshore wind farm. The proposal was for a 468-megawatt development consisting of 130 turbines (Cape Wind | BOEM). The main source of controversy, however, was that it would have been located in the historic Nantucket Sound. By the end of 2017, CWA finally announced that it would relinquish its lease after years of battles (Cape Wind | BOEM). The process had been so contentious that a documentary was made in 2011 titled "Cape Spin" in an effort to capture the struggle between developers, conservationists, and wealthy families like the Kochs and the Kennedys, both of whom were in vehement opposition to the project (Seelye, 2017).

Interestingly enough, with Cape Wind officially pronounced dead and with the success of the Block Island Wind Farm, a new wave of interest and investment has arrived in the United States with respect to offshore wind farms (Bush and Hoagland, 2016, Klain et al., 2017). The Federal agency overseeing offshore wind energy development, the Bureau of Ocean Energy Management, has fifteen active commercial leases along the outer continental shelf designated as areas specifically for offshore wind energy development which could cumulatively generate over 21 gigawatts of electricity ("A Message From BOEM's Acting Director", 2019).

2.4 MASSACHUSETTS AND VINEYARD WIND

Massachusetts has declared itself to be at the forefront of offshore wind development in the United States and is currently racing to develop the first utility scale offshore wind farm in US Federal Waters (WBUR, 2018). In the summer of 2016

the Massachusetts legislature ratified a piece of legislation titled An Act to Promote Energy Diversity (Massachusetts Bill 4568) which mandated that State utilities contract 1600 megawatts of renewable electricity by the year 2027. The following summer, Massachusetts issued a Request for Proposals (RFP) for offshore wind energy contracts, and in May of 2018, Vineyard Wind won the procurement bid (Massachusetts Ocean Management Plan).

The Vineyard Wind project is an 800-megawatt wind farm which will be located within a 160,000-acre parcel south of Martha's Vineyard. The project is still in the development and permitting stage, but it promises to provide power to more than 400,000 Massachusetts homes at competitive prices and cut carbon emissions by more than 1.6 million tons per year (Vineyard Wind. "Vineyard Wind 1").

The framework introduced by Sovacool and Ratan in 2012 will function as the guide for this study; however, this particular analysis will use the nine criteria solely to examine offshore wind energy. Specifically, this study aims to determine if this framework can be used effectively when considering the Vineyard Wind project, in hopes of informing further research into whether the framework can be applied as-is to offshore wind energy development in general, as opposed to simply terrestrial renewable energy infrastructure.

While the mechanics of offshore wind turbines are similar in many ways to those of their onshore counterparts, there are marked differences. The turbines are far larger and the process of installation (both from an engineering and policy perspective) is decidedly different. Unsurprisingly, the idea that creating a massive industrial complex

miles from shore protects it from controversy is in no way true; environmental considerations and spatial planning issues persist, as does the need for thorough public participation (Haggett, 2008). Siting a project in a marine environment can be an emotionally charged and controversial affair (Bidwell, 2017). The prospect of such construction can evoke powerful opposition based on a perceived invasion or disturbance of an individual or a community's sense of place. This further reinforces the need for public input and community engagement every step of the way.

Alternatively, it has been argued that community acceptance is too heavily emphasized (Wolsink, 2000), and that while undeniably important, public attitude is only one piece of a larger puzzle of social acceptance. This is where the other two categories of socio-political and market acceptance come in; understanding all three of these aspects and recognizing them each as valid helps to bring together a wide array of experts from across the spectrum of those involved. This in turn allows an array of stakeholders to feel heard, and more importantly respected (Aitken, 2010), thus easing the tensions of a delicate situation.

This study tests Sovacool and Ratan's nine criteria against offshore wind energy for the first time in the United States and aims to understand the social climate of Massachusetts with respect to the development of offshore wind energy. Offshore wind farms were not among the case studies addressed by Sovacool and Ratan and were hardly discussed or considered in the analysis. Their under-representation in this piece is especially noticeable considering the fact that the technology was well established in Europe by 2012. This study considers how key participants and stakeholders in

Massachusetts feel about the Vineyard Wind project by using Sovacool and Ratan's 2012 framework to identify indications of support of opposition. The findings from this study may prove beneficial in further research in the field. While there no large-scale offshore wind farms in the United States as of yet, there are (as previously stated) many plans for development. As wind farms are built in federal waters of the United States, the considerations and determinations in this study along with the conclusions drawn could serve as a resource for future research.

CHAPTER 3

METHODS

This study followed a pragmatic research method - an approach that encourages using “whatever philosophical or methodological approach works best for the particular research problem at issue” (Robson, p. 183). In the original 2012 study by Sovacool and Ratan, the researchers populated their framework with data collected through interviews. Participants of that study represented key stakeholders, including (but not limited to) electric utility companies, academic institutions, nongovernmental organizations, research institutes, regulatory agencies, government systems, and manufacturing companies. For the study reported here, the goal was to take as similar an approach as possible in an effort to use the framework as it was intended, which in turn allowed this researcher to best determine how effectively it would translate with respect to the Vineyard Wind project.

Data were collected through a series of semi-structured key participant interviews. Rather than conduct random sampling, the individuals were selected specifically for their connections to the criteria with which this project is concerned, namely socio-political, market and community. Potential interviewees were selected based on their involvement - be it professional, recreational and/or social - that illustrated that they were particularly connected with and informed on the establishment of with the offshore wind energy in Massachusetts.

3.1: METHODOLOGY:

The original list of participants to be contacted for interviews was created using a purposive sampling approach (Robson, 2016). This list included legislators, agency representatives, and stakeholder representatives such as developers, regional commissions and planning councils, as well as environmental groups and fishing advocates. The list expanded through snowball sampling (Robson, 2016) after recommendations from interviewees, and through in-person networking at conferences and meetings. Such events include but are not limited to the International Offshore Wind Partnering Forum Conference which took place in Princeton, New Jersey between April 3 and April 9 of 2018; the Marine Renewable Energy Conference in Fall River, Massachusetts on May 16, 2018; and the Northeast Regional Planning Body Spring Meeting in Warwick, Rhode Island on June 21, 2018.

Individuals were contacted either through email or telephone call (see Appendix A for full scripts). If an individual was met at a networking event, they received the same email or phone call as those found in Appendix A, altered only to include where they were met. If they were referred by another participant, the identity of that participant was kept private, and they were referred to only tangentially by their type of work, for example “a member of the Massachusetts legislature suggested that you would be a good person to speak with.”

Dates and times for the interviews were scheduled either through email or on the phone. If the interview was to be in-person, the researcher would bring two copies of a blank consent form (see Appendix C); one for the participants to sign and return to the

researcher and one for them to keep. If the interviews were to be conducted over the phone, participants were emailed the consent form ahead of time and asked to sign, scan, and email it back ahead of the interview. No interviews were conducted without a signed consent form.

The semi-structured interviews all followed the same script known as an interview protocol (see Appendix B), which was designed to facilitate discussion without restricting conversation. Semi-structured interviews allow for discussion to evolve naturally and offer a greater deal of flexibility to both the participants and researchers with respect to the order of and the amount of time spent on each question (Robson, 2016). By using this method, each question was answered uniquely, allowing for perspectives and insights to vary from person to person.

The interviews were divided into the three main categories set out in Sovacool and Ratan's framework: Socio-Political, Market, and Community. Within each of the categories, questions were designed to generate data which could be used to inform the nine criteria. Before discussing the scripted questions, each participant was given an opportunity to discuss their backgrounds and their connection to offshore wind energy. This was both to allow the participants to get comfortable, as well as a way to glean any extra pieces of data that may not have come out naturally doing the rest of the questioning.

Interviews were transcribed using NVivo 11; a research software designed to help code and organize qualitative data. Data was then coded into categories; nine were based directly on the framework, and several others were created as important tools for

organizing and defining indicators to populate the framework's criteria (see Appendix D for full codebook). This study was written based off of the analysis of this coded data.

CHAPTER 4

FINDINGS / DISCUSSION

This section will detail how interview participants responded to the questions asked of them which were designed specifically to correspond with the nine criteria presented by Sovacool and Ratan. Not only do these responses comprise the data which informs the efficacy of the framework, but they also provide a well-rounded assessment of public perceptions and overall sentiment.

Subsection 4.1: Criteria will consider each of the nine criteria separately. Each analysis will begin with an italicized review of Sovacool and Ratan's definition of the criterion. Each of the nine criteria will be analyzed using lines of questioning including (but not limited to): Was the criterion satisfied? If so, how well was it met? Did participants feel that enough was being done? How did participants feel about the process through which the project is being developed?

The next subsection 4.2: General Discussion will consider three themes which emerged apart from the framework but still informed how people feel in Massachusetts with respect to Vineyard Wind and offshore wind in general. Subsection 4.2.1: Distinctions looks into differences between how people feel about offshore wind and renewable energy in general versus how people feel about the Vineyard Wind project specifically. Subsection 4.2.2: Commercial Fishing provides an overview of the controversy between developers and the commercial fishing industry. Finally

subsection 4.2.3: Transmission Concerns briefly considers concerns over the physical integration of the energy produced into the existing electrical grid.

The reason for this organizational structure - specifically the rationale behind combining findings and discussion into one section - is that given the qualitative nature of this study attempting to boil responses down to statistical-style data would be a mistake. Interviews were loosely structured and allowed for discussion to flow naturally. Responses were multi-layered, and findings must be presented in tandem with context in the form of discussion or else they will not make sense or accurately convey nuanced realities.

Throughout this section, participants will be referred to in general terms designed to describe the sectors they represent. No quotes will be directly attributed to any interviewees in an effort to preserve their privacy.

4.1: CRITERIA

This section goes through each of the nine criterion, defines them, and discusses indicators showing how they were or were not met. Discussion around how well they were met will follow in the conclusions section.

4.1.1 SOCIO-POLITICAL:

Criterion 1:

***Strong Institutional Capacity:** Countries exhibit institutional support at the national level through ministries or departments of energy with specific programs or subsectors dedicated to renewable energy, or have government sponsored institutes doing research on renewable energy.*

Starting from the top, The U.S. Department of Energy (DOE) through its Wind Energy Technologies Office) and The Department of the Interior (DOI) through the Bureau of Ocean Energy Management (BOEM) are the main federal entities concerned with offshore wind energy development (DOE | National Offshore Wind Strategy) along with the National Oceanic and Atmospheric Administration (NOAA). Ultimately BOEM is the agency which leases offshore wind energy areas. BOEM restructured in 2010, changing its name from the Mineral Management Service (MMS) in order to, “more accurately describe the scope of the organization’s oversight” (“The Reorganization of the Former MMS” | BOEM). The main areas of focus for BOEM are Oil and Gas Energy, Renewable Energy, Environment, and Marine Minerals.

The Vineyard Wind project is being developed in a lease area designated by BOEM, unlike the Block Island Wind Farm, which was located in Rhode Island State waters. While the very fact that there is a Federal agency responsible for overseeing and managing offshore wind development might suggest support at a national level, the sentiment from most participants in the study was that there was not much capacity at the Federal level. As one participant stated,

“Federally speaking we definitely are struggling . But also hopefully temporary. And I should say federally at the administration level we aren't necessarily struggling in Congress but we also just don't have to ask much of Congress these days. I mean offshore wind is just so multi... so inter-governmental, there's permitting that needs to happen federally, state, locally. So to have all of those levels of government being supportive at one time - it's like the stars have never fully aligned...”

Another participant who echoed this sentiment expanded on the idea that there is a general lack of coordination at the upper level, not only among legislative branches of government but also with regard to gathering information and cooperating with other agencies.

“...the regulatory framework is very complicated, and it's one of the most challenging aspects for the developers, and part of that too is even on the federal side. While BOEM, they're sort of charged with being the lead federal agency, they really don't have tremendous capacity internally to handle a lot of aspects of that, and so they rely on groups like [The National Oceanographic and Atmospheric Association (NOAA)] and the National Marine Fisheries Service to provide advice about fisheries aspects, and then they're relying on Coast Guard for safety issues and so on. So it's this somewhat fuzzy environmental or compliance and safety and permitting framework that I think has been one of the more challenging aspects of this for the developers and so I think one of the things that I've heard regularly called for is some sort of more cohesive process for getting the permitting and you know for what needs to be done in order to meet the requirements for environmental compliance and so on.”

At the State level, the perception is quite different with respect to institutional support. What follows is a list of State and Quasi-State agencies, all of which have a hand in supporting the development of offshore wind in MA:

- **The MA Executive Office of Energy and Environmental Affairs:** The only state Cabinet-level office in the country that oversees both environmental and energy agencies (Mass.gov. “Executive Office of Energy and Environmental Affairs.”)
- **The MA Department of Energy Resources** (mass.gov “About DOER.”) including:
 - **Emerging Technology Division:** Works to advance emerging technologies in clean energy and alternative transportation (mass.gov “Emerging Technology Division.”)
 - **Energy Efficiency Division:** Develops, implements, and oversees energy efficiency activities (mass.gov “Energy Efficiency Division.”)

- **Energy Policy Planning & Analysis Division:** Works to gather and analyze energy data to provide a comprehensive overview of energy prices, competitive markets, energy resiliency and more (mass.gov “Energy Policy Planning & Analysis Division.”)
- **Green Communities Division:** Provides grants, technical assistance, and local support from Regional Coordinators to help municipalities reduce energy use and costs by implementing clean energy projects in municipal buildings, facilities, and schools (mass.gov “Green Communities Division.”)
- **Renewable Energy Division:** Provides information regarding the different kinds of renewable energy, funding programs and incentives, installation assistance, and more, including wind, solar, biomass and more (mass.gov “Renewable Energy Division.”)
- **Massachusetts Office of Coastal Zone Management (CZM):** The lead policy, planning, and technical assistance agency on coastal and ocean issues within the Executive Office of Energy and Environmental Affairs (EEA) and implements the state’s coastal program under the federal Coastal Zone Management Act (mass.gov “Massachusetts Office of Coastal Zone Management.”)

Furthermore, there are many academic institutions in Massachusetts working on government sponsored research, including but not limited to: The University of Massachusetts Dartmouth, Woods Hole Oceanographic Institute, and Tufts University.

Technically speaking this could have been a stopping point for this first of nine criteria, but there was another line of questioning worth pursuing. The phrasing of the definition had limited “institutional support” to government, or government sponsored research institutions, not leaving any room for other entities. In interviews, participants were asked “Which if any organizations involved in offshore wind energy development are you familiar with?” (see Appendix B), in an effort to find out if the entities they named would fit into this definition of “institutions.” Unsurprisingly, most

participants first named whichever organization they were representing. Next, most named the two major developers; Vineyard Wind (along with sometimes the parent companies Copenhagen Infrastructure and Avangrid) and Orsted. What follows is a list of the most common *following* responses:

- Bureau of Ocean Energy Management (BOEM)
- National Oceanic and Atmospheric Administration
- Various academic / research institutions conducting research
- Massachusetts State Legislature
- Many of the aforementioned State agencies
- National Wildlife Federation
- The Audubon Society (both National and MA)
- The two large utility companies in Massachusetts; National Grid and Eversource
- The fishing industry as a whole

Overall, the general sentiment of this criteria was that there was strong State support but thin Federal support. There was a great deal of overlap during naturally flowing conversation, and data was not always able to be specifically placed into one criterion or another. There is more discussion on this to come in the following sections.

Criterion 2:

Political Commitment: *Political leaders make promoting renewable energy a highly visible topic*

There was consensus among interviewees that Massachusetts legislators are generally supportive of offshore wind energy production in their State. Of the Massachusetts legislators, two were referenced most often: Governor Baker and Representative Patricia Haddad.

Baker was often described as being initially cautious, but eventually coming around as a proponent. As one participant put it,

“Governor Baker came into office in early 2015 and was skeptical about offshore wind, which is fair given that the experience we’d been going through with Cape Wind and the price of Cape Wind was higher, but the governor has given it a chance, and after going through the bidding process, first signing legislation in 2016 to create the market for offshore wind which was sort of the missing piece and then you know the follow through on that utility procurement and seeing the very attractive price of the Vineyard Wind proposal that was accepted, that I think has done a lot to create greater acceptance. I think I would dare call it enthusiasm for offshore wind now.”

This idea of cautious, pragmatic support from Baker was echoed by multiple participants, and the degrees to which they viewed him as a champion versus a somewhat measured participant varied. While the quote above describes Baker as having come around to something resembling enthusiasm, others did not share such a favorable take. Here, one participant asserts,

“The governor, he’s committed but he’s committed in a different way. His commitment is to the price. So I understand that and I respect that opinion but I think that that is short sighted in the grand scheme of what we’re trying to do here.”

Taking it a step further, when asked if they felt that offshore wind had support from Massachusetts politicians, another participant responded by saying,

“Not enough by the governor. We’re looking not just for support we’re looking for leadership. So that means pushing. And certainly New York Connecticut are doing a lot more when it comes to offshore wind that they’re looking for.”

While there was a general sense of lukewarm support from Governor Baker, participants were far from tepid in their descriptions of Representative Haddad’s support. In 2016, Haddad and Matthew Morrissey were awarded “Man and Woman of the Year.” Morrissey was then the Vice President of Deepwater Wind, the company that developed the Block Island Wind Farm. Deepwater Wind has since been acquired

by the European company Orsted, which is headquartered in Denmark. Haddad and Morrissey were honored for their:

“...leadership and years’ worth of determination to persuade the Massachusetts Legislature, Gov. Charlie Baker, a swarm of environmental groups and regulators, and regional business interests that the state and region could be the launching point for a new industry that would help fight global warming and create vast economic opportunities.”
 (“Morrissey, Haddad Honored for Work on Behalf of Offshore Wind | New Bedford Economic Development Council”).

During interviews, some participants of the study even referred to Representative Haddad by her self-appointed nickname the “Witch of Wind”. For context, this nickname serves as a replacement for what she used to call herself; the “Queen of Coal”, which was in reference to the newly decommissioned coal fired power plant in Somerset, MA which lies within her district.

Time and again during interviews, Haddad was referenced as something of a champion on offshore wind. Haddad was instrumental in pushing through the 2016 Act to Promote Energy Diversity, “which among other important legislative elements, allows for the procurement of up to 1,600 megawatts of offshore wind energy by 2027.” (mass.gov “Offshore Wind.”) This piece of legislation will be discussed in greater depth in the following section. Since then, Haddad has continued her work promoting offshore wind, introducing more legislation. Said one participant,

“She has filed legislation which we think is a good idea that allows for the next bids to come in at more than that six cents a kilowatt hour - six and a half cents, whatever it is. So we think that's a good idea that they can they can push that up because the law says you can't go higher than the previous bids. So that's not sustainable. So financially I'm no expert in this but I know that it doesn't make sense to keep it at six cents.”

The piece of legislation referenced in the quote above refers to Amendment #280, as changed to H3800 Offshore Wind Price Decline, which was adopted, and aims to promote continued market competition among bidders. Additionally, Haddad has introduced other pieces of pertinent legislation, including but not limited to: H.2487, An Act Establishing A Commission To Study The Offshore Wind Investment Tax Credit, and H.2867, An Act Relative To The Continued Enhancement Of The Offshore Wind Industry In The Commonwealth. The last two bills are currently under consideration.

Haddad, alongside Morrissey, credited their success in pushing through the 2016 legislation to the teamwork of other members of their legislative delegation, along with New Bedford Mayor Jon Mitchell and Economic Development Director Derek Santos, as well as the Port of New Bedford, various academic institutions, and others (“Morrissey, Haddad Honored for Work on Behalf of Offshore Wind | New Bedford Economic Development Council”). With this in mind, it is arguably fair to say that despite Baker’s middling reviews, Massachusetts has reasonably strong political commitment.

Criterion 3:

***Favorable Legal and Regulatory Frameworks:** Laws and regulations facilitate ease of entry into the renewable energy market, independent renewable energy producers (even homeowners) are granted access to the electricity grid, national interconnection standards exist, and regulatory changes occur in a predictable and transparent manner*

Most participants pointed to the aforementioned 2016 Act to Promote Energy Diversity when asked about existing legislation surrounding offshore wind energy development. This legislation, as described below,

“...direct[s] distribution companies (companies engaging in the distribution of electricity or owning, operating or controlling distribution facilities) to jointly and competitively solicit proposals for offshore wind energy generation from offshore wind developers and enter into contracts for the purchase of up to 1,600 MW of aggregate nameplate capacity by June 30, 2027.” (Burdock and Barminski, 2016)

Generally, people considered this Act to be proof positive of a favorable framework within the State. Specifically, people cited the fact that the bill directly requires utilities to contract 1600 megawatts of clean energy, the reasoning being that making it a mandate signifies genuine legal commitment rather than just simply stating intent. A few participants also referenced the act passed by the MA State Legislature in 2018 titled An Act to Advance Clean Energy which doubled this requirement to 3200 megawatts by 2030, causing a great deal of excitement in the offshore wind community (Business Network for Offshore Wind, 2018).

A few participants then brought up a piece of legislation passed in 2018 called The Energy Future Act, which was the follow-up to the 2016 Act to Promote Energy Diversity. As one participant put it,

“Certainly the you know the legislation in Massachusetts to help create the market for offshore wind, which was first signed in 2016 requiring the utilities to do procurements for offshore wind for entering into long term power purchase agreements which is - that's what's necessary to enable the financing is for the investors to see that there's a clear price that the power can be sold at. And then in 2018 there was a kind of an update the law passed that increased the amount that we wanted that the state should procure.”

At the Federal level, multiple participants referenced the Federal tax credit as legislation which supported offshore wind development, albeit somewhat tangentially. The full name of this incentive is The Business Energy Investment Tax Credit, or simply the ITC. This program is a federal income tax credit for capital investments in renewable energy projects (U.S. DOE). The ITC is the closest piece of federal level *legislation* that could act as an indicator with respect to this criterion.

The program has gone through multiple iterations; in 2008 the Energy Improvement and Extension Act was enacted, which (among other things) extended existing tax credits for many clean energy technologies by eight years (DSIRE USA). The credit was further expanded in 2009 by the American Recovery and Reinvestment Act, and again in 2015 by The Consolidated Appropriations Act.

When considering how supportive legal and regulatory frameworks are at the national level, overall sentiment generally echoed the following quote by one participant, that;

“...other than the federal tax credit, I’m not sure that they have too much skin in the game, the feds”

Others described Federal involvement in a slightly more generous light, but still refrained from going so far as to say there were substantial amounts of support. One participant referenced another piece of legislation, saying,

“Starting federally there's not a ton of offshore wind legislation, exceptions being that there's currently an investment tax credit that is due to expire at the end of 2019 and there is legislation introduced to extend that. There's also been legislation introduced to establish a grant program for offshore wind jobs training facilities and just sort of building up offshore wind jobs training programs. Those are both, well I would say the investment tax credit

bill very well could be successful. The jobs training one is a little bit less likely as of now but that could change.”

The ITC will be brought up again and the specific economics will be considered in further detail in discussion of criterion six in the Market section.

4.1.2 MARKET:

Criterion 4:

***Competitive Installation / Production Costs:** Renewable energy technologies can produce electricity at a competitive rate compared to other sources of supply, driven by government incentives, a large resource endowment, and/or a strong local manufacturing base*

There was general consensus that the offshore wind farm will produce electricity at a competitive rate, with prices being quoted at 6.5 cents per kilowatt hour. This first criteria within the Market section describes three elements that can account for healthy competition; government incentives, a large resource endowment, and/or a strong local manufacturing base. Each is discussed below:

First, government incentives are apparent in the form of procurement procedures, power purchase agreements, and legally binding legislation. The directive that Massachusetts *must* procure 1600 megawatts of clean energy, and the fact that this process *must* be done through competitive bidding in response to the solicitation of a Request for Proposals (RFP) meant that rates which were ultimately accepted through power purchase agreements would be affordable to consumers.

A large resource endowment is present given the fact that the area is geographically very productive for wind. Not only was this idea brought up quite a

few times by participants, but it has been publicly commented on many times. As recently as October 1, 2019, New York Environmental Lawyer Dan Chorost was quoted as saying,

“People refer to the waters off the northeastern United States as the ‘Saudi Arabia of offshore wind’ because we have the perfect combination of strong winds, shallow ocean and demand” (Super Lawyers, 2019)

References of the Northeastern US being the “Saudi Arabia of wind” have been peppered throughout headlines for years. This theme of resource reliability was summed up by one participant who stated,

“...the energy itself is there... it's like hydro - the resource is there. So there's zero marginal cost for the energy.”

With respect to the third element however - a strong local manufacturing base - there was much discussion regarding how the US is currently lacking a domestic supply chain. One participant effectively summed up the essence of the matter when they said,

“We might be undercut - if that's the right word, it's probably not the right word, by our European companies who are further along in their development. And so again I think it's a matter of a concerted effort to try to put these supply chains into place. And it's difficult because we really don't have a very big footprint right now of offshore wind. I mean it's you know we're talking I think five turbines right on the Block Island. I think functioning, that's not exactly a high-volume operation. Now Vineyard [Wind], now we're talking about more like somewhere in the eighties number of turbines. So that's going to scale it up. And so I think with that hopefully we'll also see as a scaling up of those supply chain pathways and the companies that have that ability to come step into that role. And we'd like to see that they establish a footprint in this area, we'd prefer that they have a presence here, and that feeds into sort of the local economy. But I think it's something we have to kind of wait and see.”

In conclusion, it appears that there was a general consensus among participants that there are competitive installation / production costs; although, there is still work to be done to ensure that Massachusetts doesn't have to rely too heavily on foreign imports. That said, there is comfort in knowing that the technology that will be imported is efficient and advanced.

Criterion 5:

***Mechanisms for Information and Feedback:** Investors and users/producers have access to reliable information about renewable energy policies, prices, and opportunities*

To collect data for this section, participants were asked if they felt that there was an adequate framework in place to inform the public on policy mechanisms. This proved to be a problematic criterion and will be discussed in greater detail in the Conclusions section.

One main complicating factor was that the energy generated by the development will enter the grid and become part of the larger pool of electricity. As one participant put it, “...we have this interconnection grid and once electricity enters it's fungible.” As such, there aren't unique or new policies, prices, or opportunities as a result of offshore wind development in Massachusetts - the energy produced will simply be integrated into the grid. As far as having access to reliable information about prices, the negotiated rate of 6.5 cents per kilowatt hour was made public during the Summer of 2018.

That said, there are currently dozens of policies, services and programs that exist in Massachusetts with regard to renewable energy and energy efficiency. Figure 4.1 is a screen-grab from the Massachusetts government website which shows a selection of

such initiatives. The information is readily available and easily accessible to anyone who wishes to access it or opt in.

Another way to consider the phrase “access to reliable information” is by reflecting on the idea of transparency. This criterion indicates that the details of a project should be publicly available rather than hidden or inaccessible. When asked about transparency of the process thus far, many participants who didn’t feel confident speaking to this criterion as it was originally worded felt better able to discuss their thoughts.

There were two main schools of thought with regard to transparency. The gist of the less popular perspective was that all of the information is and has been public, which checks the accessibility box so to speak. As one participant put it,

“There was there was I think a lively open debate about it - it was in the press a lot. So I think that probably passes muster in terms of transparency... well and then the utility contracting process, it's a mix, you know closed procurement where - well, at least when the RFPs come out - that's widely publicized; there is a website that's accessible to all where all of the information is posted - redacted versions of the applications that are received are all posted, there's an independent evaluator as part of the evaluation process so you've got the utilities you've got the State Energy Office and then an independent entity, the attorney general's office has been very engaged. And then the contracts are reviewed in an open process at the DPU [Department of Public Utilities]. So I don't know, that sounds fairly transparent to me.”

A more popular sentiment was that all the info is out there, but one would need a full-time job dedicated to following along and keeping up with every meeting, forum, hearing, and comment period in order to stay truly informed. One participant described the process by saying,

“I think that it could be far more transparent especially project selection, and I think we're making progress in this space - So Massachusetts was the first state to set an offshore wind goal and issue an RFP and select winning bids, and it was a pretty opaque process, we didn't really have an understanding of, you know, there was criteria listed in the Request for Proposals but it wasn't clear how the criteria was being considered, and what had more weight than other things and then in RFPs since then there have been a bit more detail on like 75 percent will be cost and 25 percent will be these other qualitative measures.”

Furthermore, one would need to be able to understand all of the highly technical elements, complex issues, and complicated language in order to have a voice. This will be discussed in greater detail in the Community section with respect to Participatory Project Siting.

Criterion 6:

***Access to Financing:** Producers, manufacturers, and users have access to domestic sources of low cost financing and/or can benefit from specific government financing schemes*

Creating the Vineyard Wind project appealed to developers because of the Federal Tax Credit (ITC), the advanced turbine technology and industry experience (in Europe), and the requirement that utilities do procurements for offshore wind and enter into long term power purchase agreements.

The ITC has the potential to save developers millions of dollars on large wind energy facilities, both land-based and offshore and offers a huge return on investment (U.S. DOE). The credit for large wind turbines is 12% of expenditures if construction begins by December 31, 2019 (U.S. DOE). Currently due to expire at the end of 2019, legislation has been introduced to extend it once again. Advanced turbine technology and industry experience in Europe provides assurance that the industry is established

and removes a degree of risk. That said, it was the requirement that utilities do procurements for offshore wind and enter into long term power purchase agreements that was most commonly referenced as being a major driver of success. For example, on August 2, 2018, WCAI, the Local NPR station for the Cape, Coast & Islands published an article stating,

“Vineyard Wind has attributed their drastically lower rate to the fact that offshore wind technology has advanced in the last few years and turbines are more powerful and efficient now. Experts also say the competitive bid process enacted by the state, and a 20-year power purchase agreement with the company, has contributed to a lower rate, as has a federal investment tax credit which will add about \$200 million in savings for the company.” (Mizes-Tan, 2018)

These long-term contracts are so important to developers because of the fact that these projects are financed by private investors. While it may be based out of offices based in Boston and New Bedford, Vineyard Wind LLC is a joint venture between Avangrid Renewables which is a subsidiary of Iberdrola - a multi-national electric utility company based out of Spain (Iberdrola) - and Copenhagen Infrastructure Partners (CIP) - a multinational fund management company based out of Denmark (Copenhagen Infrastructure Partners).

One specific detail that was cited as being a particularly beneficial was that Massachusetts, unlike other states, have made utility participation a statutory requirement, rather than a policy with room for choice in the matter. One participant succinctly summed this up by saying,

“...a wind farm won't be built unless a developer knows that someone's going to buy their electricity. And with the energy act we have in Massachusetts there's a procurement. So the utilities have to buy the sixteen hundred

megawatts which means there's a guarantee of some finances with some payback to it."

4.1.3 COMMUNITY:

Criterion 7:

***Prolific Community / Individual Ownership and Use:** Renewable energy systems tend to be installed, owned, and/or or used locally*

Simply put, the answer to the question of whether or not this first criterion was fulfilled is no. Not only will the project not be locally owned or operated, it will be located many miles offshore in Federal jurisdiction. Furthermore, it is a large, grid-scale power producing facility akin to a traditional power plant.

There were two common schools of thought encountered when participants were asked whether or not they felt that the citizens of Massachusetts would have an adequate stake in the control and/or management of the wind farm. Some felt that citizens had no control and were entirely at the mercy of those in positions of responsibility. Others felt that although perhaps the average person wouldn't have direct control, they felt that their elected officials had a say in the matter, and that therefore they were acting as a sort of ambassador, advocating for their constituency, giving the citizens some management-by-proxy. These two viewpoints were not always mutually exclusive. In the following quotation, a participant effectively expresses both, stating,

"...the community doesn't own and make decisions about the wind farm, but they don't own and make decisions about most electricity generators. Our structure is that the vast majority of these electricity generators are owned by corporations who site, permit, build, operate, and sell electricity into the grid. And parts of those processes are regulated, so representing the public

interest is a public sector regulatory process. So there's indirect public interest and there's indirect public oversight through their elected officials and the appointed regulators. But it's not the same as saying it's a community-owned facility where the Board of Selectmen or the Mayor and their designees have direct say on how something operates or it's operated by municipal utility. That's because these are being built in Federal waters and by companies who are going to be competing to get a power purchase agreement and sell into the grid. It's indirect public oversight. But there is public - there is an indirect oversight through the regulatory process.”

Another recurring idea that the quote above shows is this feeling that the average consumer doesn't particularly want to or care about being involved with where their power comes from, and that most people wouldn't give the matter much thought anyway. This generally came across as a sort of justification or defense, the reason being that those participants who said things like this were largely supportive of the Vineyard Wind project. These participants seemed somewhat reluctant to answer with a definitive no, and so they brought this up as a sort of compromise. That said, even the staunchest defenders of the project didn't say yes. Those participants interviewed who were somewhat more hesitant with their support - specifically those concerned with the interests of the fishing community - were much more willing to answer this criterion with a hard no, with one participant simply stating “*No, no no. They're Federal - they're in Federal waters.*”

Criterion 8:

Participatory Project Siting: *People and communities are involved in the decision to site or permit renewable energy facilities near them*

This criterion produced the widest range of opinions and responses. Each participant was familiar to some extent with the history of how the project was sited.

Some brought up legislation that had paved the way, referencing the Massachusetts Ocean Management Plan which was created in 2009 and amended in 2015. It was produced in response to the Oceans Act of 2008, and was described in a 2008 legal publication as being,

“the first of its kind in the country... an effort by the legislature to create a uniform regulatory system to balance current and future commercial and recreational uses of Massachusetts’s ocean resources with the need to protect marine habitats and natural resources. The Act calls for a comprehensive ocean management plan to be developed by the Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) by December 31, 2009.” (Nutter, 2008)

The staunchest proponents of the Vineyard Wind project asserted that the whole process has been very inclusive, while those with a less rosy outlook on the project contended that any such inclusion had been more or less for show. One interviewee candidly stated that the process had been,

“...full steam ahead, and if you get in the way you'll get paid off and that's it. So there's a sense that there's the developers' commitments to the [fishing] industry in terms of hiring liaisons and hosting meetings and hearings is simply checking a box. Yeah. They don't really care...what happens to that industry... about what happens to the actual ocean environment. They care about making money offshore.”

The general outlook of the majority of respondents, however, echoed the concerns raised in Criterion 5 within the Market section; Mechanisms for Information and Feedback. The feeling was that while technically there was opportunity for participation throughout the siting process, it was a virtually impossible task to follow along with all the news and announcements. Many interviewees laughingly

commented “define adequate” or “define acceptable” before sharing their thoughts, mostly reiterating the following sentiment,

“I think just anyone who is not a full time, technical... doesn't have a full-time technical analyst on their team able to really dig in and pay close attention to every stage of the process doesn't really have a shot at keeping up with and weighing in in a meaningful way.”

The feeling of frustration expressed above was coupled with the sense that many people hadn’t heard of the project until the planning phase was already well underway, and therefore those individuals felt that by the time the project was on their radar, it was more or less too late.

There was a similarly large spectrum of opinion among participants around the idea of inclusivity of the process. Participants expressed anything from dogged defense around the inclusivity of the process, to staunch criticism of how things had turned out. Some interviewees felt that all groups/individuals/entities had been well represented during the siting process and were in no way worse off, others felt the absolute opposite. As one supportive respondent put it,

“...I mean everyone on Martha’s Vineyard and Nantucket was included, the Native Americans who had, you know, they had everything before we did, they were very much included in the process, fishermen are continuing to be included in the process, environmentalists, we have a lot of academics who have been working with us, URI is one of them, Tufts, three of the UMass campuses, Mass Maritime Academy, Woods Hole Oceanographic Institute, we have a couple of the State University people, Bridgewater and then a couple of the community colleges, it’s a consortium”

At the other end of the spectrum was this commercial fisheries representative’s perspective:

“Oh yeah. Oh definitely. I mean anyone who relies on those areas for their livelihood in terms of the resources that are there or even just steaming through them to get to the resources that they're harvesting has the risk of being significantly impacted you know they could not have a business if either it's is not economical for them to get to their fishing grounds or if the resources are impacted negatively, so I think there's a high risk for anyone for any industry, not just fishing but any industry that's actually relying on the resources in the areas where the wind farms are planned to be developed. They're at the highest risk of being impacted.”

A large amount of discussion in this section revolved around the conflicts between the fishing community - specifically commercial fishing - and the rest of the stakeholders. There will be a more in depth look at this conflict in section three of this chapter; General Discussion, but for now it is worth noting that the main subject of controversy with regard to this section was between people who felt the fishing industry was acting as too much of an impediment, and those who felt that livelihood was at stake.

Criterion 9:

Recognition of Externalities or Positive Public Image: *Community members are generally aware of the environmental impact of conventional energy and the benefits of renewables, cultivating a strong public image*

There was nearly unanimous agreement among participants that there is an overall positive public sentiment towards renewable energy and offshore wind in general among citizens in Massachusetts. As demonstrated in the two quotations below,

“Massachusetts is very very very much of a leader in clean energy development and clean technology development and innovation and it's proven to be good for the economy.”

“Yeah I would say by and large there is majority support. I think again for the reasons I said earlier, the fact that we do need to shift away from fossil fuel sources, and it has the potential to be an economic benefit to the area.”

The most common reasons that participants cited for high levels of Massachusetts support were: economic boon, job creation, industry growth, climate change mitigation, and a shift away from fossil fuels. This tracks with the results of a 2018 poll which found that 84% of Massachusetts residents want to be able to choose clean, renewable energy as a source for their home, 83% of Bay Staters want to be able to choose who provides their electricity, and 74% of Massachusetts residents would be interested in 100% of their electricity being renewable energy if provided the option. (Clean Choice Energy, 2018)

In contract to this rosy sentiment, however, something which was brought up by quite a few participants was the legacy of the failed Cape Wind project. Nowadays after years of debate, a common sentiment both among supporters and opponents of the project can be summed up by one participant's quote,

"Cape Wind was I think doomed from the start. I shouldn't [say that] - but it was close to shore, a part of the Cape, a part of Massachusetts that people thought of not as having industry but having recreation, having you know... people go and watch sunsets... you know it was the Cape!"

In the wake of all this turmoil, it has been difficult for advocates of wind farms to communicate with people who are still dealing with the exhaustion and whiplash of Cape Wind. Some of the main differences that have needed to be emphasized are location, price, and overall skepticism. As explained by one respondent,

"...the impact of Cape Wind makes the conversations here a little different because in Massachusetts people have been hearing about offshore wind for about 15 years now, and the first 10 years of that was about a project that was going to really expensive and it was going to be really visible from shore... it was more controversial than offshore wind development is today.

So there is a need to like erase that first image in people's mind which doesn't happen in every state - you know in other states where they don't have that kind of history it's just a matter of like educating whereas in Massachusetts it's a matter of like correcting.”

The expensiveness in the quote above refers both to the price per kilowatt hour for energy, as well as the cost to develop the Cape Wind project itself. Both of these price concerns have been substantially diminished, and are addressed in the following quote by another study participant who said,

“...it becomes how much is it gonna cost... I spend so much time saying this is not Cape Wind, you know in Cape Wind prices were in the 20 [cents per kWh] and escalating, in these proposals, the price has come in at 7 cents, and more than likely as the industry matures will come down. Gas the last I heard was about 3 cents wholesale.”

While this talk of Cape Wind did not counterbalance or overshadow the overall positive sentiment expressed, it was interesting to consider the history of opposition to offshore wind energy development. In terms of positive public image of renewable energy in Massachusetts, this opposition was project-specific rather than directed toward offshore wind as a whole or renewable energy in general. That said, it did show that Massachusetts is not so blindly supportive of the technology that it is prepared to green-light any proposal that comes along; in fact, the track record showed quite the opposite.

4.2: GENERAL DISCUSSION

As previously stated, while one goal of this study was to determine the efficacy of Sovacool and Ratan’s framework with respect to Vineyard Wind, another objective was to understand how key informants in Massachusetts felt about the project and

offshore wind in general. While most of the discussion in the interviews informed the framework specifically, these next subcategories cover four themes which emerged apart from the framework but still inform how people feel.

4.2.1 Distinctions

Something that came to light during the process of interviewing was the fact that even if an individual or group was supportive of offshore wind development, that did not mean that they were supportive of the Vineyard Wind project in its entirety. On the same note, criticism of the Vineyard Wind project did not necessarily equate to opposition of offshore wind development as a whole. Moreover, participants with qualms about the Vineyard Wind project, or even those who expressed trepidation towards offshore wind development in general were not anti-clean energy. As representative for commercial fisheries explained,

“generally as an academic when you're in your highly educated you know that we need to do something about climate change you know that we have to transition away from fossil fuels. So we know we need to do that. Offshore wind happens to be the low hanging fruit right now. So we, myself included, realize that we need it but we realize that it comes as a tradeoff. That there are tradeoffs that are going to have to be made.”

This same respondent later went on to express that they felt the process had been rushed and not thoroughly researched enough, stating that,

“without doing the research we run the risk of not knowing and then being surprised about the impacts, maybe, and unfortunately it's been across the board - this happened in the UK as well, they got fast tracked - if they did any research before they went in the water it was for a year. Yeah scientifically you can't use a year data especially here in the Northeast. One year basically

counts as no data because it's highly variable. So we haven't been able to understand it."

This distinction between support of offshore wind development in general versus support of the Vineyard Wind project itself speaks to the two distinct questions this study aimed to answer. Criticism of the process and of details of the Vineyard Wind project all fell within the criteria set out by Sovacool and Ratan and helped to determine if or how well the framework could be applied. This criticism - as was noted earlier - did not discount the idea of offshore wind development as a whole, thus helping to inform the second question, that being how the Massachusetts public feels about offshore wind development in general - not simply with respect to the project at hand.

4.2.2 Commercial Fishing

Before delving into a larger discussion, it must be noted that when discussing the fishing industry (at least within the confines of this study) it is the commercial fishing industry that is being discussed, not recreational. A point which often gets brought up when discussing effects of turbines on fishing stocks is the idea that the infrastructure itself acts as an artificial reef, thus attracting fish (ten Brink & Dalton, 2018). This point, however, is only brought up with regards to a potential benefit to recreational fishermen. The concerns expressed by the commercial fishing industry stem from the fact that they are using much more sizable vessels with large gear and nets which are unable to navigate as effectively among the structures. Therefore, no matter if there is a reefing effect or not, if they are unable to operate in the way they need to, it becomes

a moot point. Furthermore, there is a persistent fear that their traditional stocks will be affected, and reefing will not be enough to offset this. Therefore, unlike recreational fishermen, representatives of the commercial fishing industry made it clear during the interviews that they felt their livelihoods were at stake.

Having addressed this contrast between recreational and commercial, it is important to acknowledge that this study does not delve into the scientific research around potential impacts on the fisheries of the Northeast United States. Rather, this section attempts to explain two different perspectives that became apparent during the interviews. The core of these perspectives was that there was criticism of the Vineyard Wind project from commercial fishermen, but just as glaringly was the criticism of the commercial fishing community by the others over their perceived stubbornness and refusal to budge.

It was widely acknowledged that commercial fishermen do not feel that their voice has been sufficiently heard throughout the process, nor do they feel that there has been enough preparatory research done. As one representative from the community explained,

“There is almost no one in the fishing industry unless they are paid very well by the offshore developers that says they support offshore wind. There are a few that will tell you they support it and there's a reason that they're saying that because a lot of money in their pocket from the people who are doing it. And that's understandable - they're going into the grounds where they fish,

they have the potential to impact the resources that they harvest, and the process that they've gone through in terms of being permitted and understanding impacts and using best available science has been completely against what that community is used to in terms of the fishery science process. So there's a very robust kind of stakeholder engagement system - fishermen didn't realize how good it was until offshore wind came along - that they go through in terms of doing stock assessments and setting quotas and developing allocations for fisheries resources. And that has not been the case for offshore wind."

Other groups, however, felt that the concerns of the fishermen were fully taken into account, and they would point to the fact that the original proposed area was massively reduced in size due to concerns and input from the fishing industry as proof. This is demonstrated in the following quote, which has been abridged slightly to preserve privacy and remove potentially identifying details,

"So the wind energy areas were developed...with BOEM and the Commonwealth and the fishing working group said we fish here and the habitat working group said we've got birds here, let's work with the public process not permitting but the wind energy siting, the areas the wind energy areas that are going to be put up for lease, let's work on configuring those

right now to make sure the least amount of damage to commercial fishing... So on the top [referencing Figure 4.3] that's where it started and at the bottom [referencing Figure 4.4] is where it ended up. And the answer to your question is yes they listen to us in establishing the wind energy area."

Asking if any groups, individuals, or entities were worse off in any way because of the siting process only solidified these two opposing perspectives.

Those advocating for fishermen said they were worse off, while non-fishermen said no, with some even expressing that fishermen were being needlessly obstinate and had been overly catered to already. As one respondent put it,

"...the commercial fishing industry has a lot of input - I mean, they never feel like it's enough.. candidly. And maybe from an industry perspective it's not enough to really protect their industry in the way they want to. But in terms of someone who's not in that community, seeing the amount of impact that they might be able to have on siting and delaying the process... if I were going to say any community was overly influential, that one, well..."

The respondent was then asked if they felt that anyone was worse off in any way after the siting process, to which they responded,

"I don't think so, though commercial fishing, I guess I would say... I'm sure that they would say that they are."

4.2.3 Transmission Concerns

Something that came up on two occasions was the topic of outdated transmission systems that are outdated and ill equipped for the varied sources of modern-day power. This was an issue that did not qualify as criticism of offshore wind, or of the Vineyard Wind project itself, but was closely enough related that it bore mentioning. As one participant explained,

“...pretty soon we’re gonna have a new problem, and that new problem is gonna be our current grid was built for a different time, and so as we have more power coming from wind, the companies are really gonna have to start to invest in that. So while we’re desperately working at stabilizing, there’s still a cost over here that’s going to become an issue and that’s transmission... probably the most annoying thing in the world is when I open up my gas bill and it says say 80 or 70 dollars for gas and 140 for transmission costs, it makes people crazy... that’s not going away”

Another participant expressed that they felt like the issue of transmission was simply not being considered enough during the development process, saying

“one of the things that we think is missing is that state procurements are only for those generators who own leases in the offshore. So we think that we get to a larger goal for offshore wind that you really also need to include the transmission element to an offshore grid to be part of that, so we think there's a lot of need for legislation along that front to support the industry here.”

CHAPTER 5

CONCLUSION

The purpose of this final section is to use the data collected in section 4.1 and the discussion of themes in section 4.2 to address the three main goals of the study: 1) To assess levels of acceptance in MA per the framework both with respect to the Vineyard Wind project and offshore wind energy in general, 2) To determine if this framework can be effectively used with respect to the Vineyard Wind development, and 3) To provide early insights into whether or not this framework can be effectively used with respect to utility-scale offshore wind developments in general.

Section 5.1 uses the data collected to populate the framework and considers important themes that arose in each category. Section 5.2 discusses the sliding scale of support that was encountered. Section 5.3 makes final determinations with respect to the goals of this study, and finally section 5.4 gives recommendations for further research.

5.1: APPLYING THE FRAMEWORK

Table 5.1 shows this researcher's efforts to fill in the 2012 framework. This chart was based on the summation chart created by Sovacool and Ratan shown in Table 5.2. Rather than assess multiple case studies, Table 5.1 measures only the Vineyard Wind case study, but also adds in indicators, much like those in Table 5.2, and then ranks them as either weak, medium, or strong.

Category	Criteria	Indicators / Evidence	Strength	Overall: ✓ or ✗
Socio-Political	Strong institutional capacity	National: BOEM	Weak	✓
		State: Multiple offices, departments and divisions	Strong	
		Other misc. orgs (academic institutions, nonprofits, utilities, companies / businesses, etc	Strong	
	Political commitment	Federal politicians / legislators	Weak	✓
		MA State Rep. Haddad	Strong	
		MA Governor Baker	Medium	
	Favorable legal and regulatory frameworks	Federal tax credit	Medium	✓
		State acts (2016 and 2018)	Strong	
Market	Competitive installation/production costs	State government incentives: procurement procedures, power purchase agreements, and legally binding legislation	Strong	✓
		Large resource endowment (productive wind area)	Strong	
		Local manufacturing base	Weak	
	Mechanisms for information and feedback	Renewable energy opportunities; existing opportunities, but nothing unique to the Vineyard Wind project yet	Medium	✓
		Transparency and access to information	Medium	
	Access to financing	Federal Tax Credit, the advanced turbine technology, and the industry experience (in Europe)	Strong	✓
		The requirement that utilities do procurements for offshore wind and enter into long term power purchase agreements	Strong	
Community	Prolific community/individual ownership and use	Argument regarding ownership / management-by-proxy by elected officials	Weak	✗
	Participatory project siting	Adequate room for stakeholder input which was taken into account to an acceptable degree	Medium	✓
		Inclusive representation with minimal bias and an equitable outcome	Medium	
	Recognition of externalities or positive public image	Major support in MA for clean energy and a renewable future	Strong	✓
		Legacy of Cape Wind	Medium	

Table 5.1: An assessment of Vineyard Wind project using Sovacool and Ratan's 2012 framework

The degree of social and market acceptance for renewable electricity in Germany, United States, Denmark, and India.				
	Germany	United States	Denmark	India
Strong institutional capacity	✓	✓	✓	✓
Political commitment	✓			✓
Favorable legal and regulatory frameworks	✓		✓	
Competitive installation/production costs			✓	
Mechanisms for information and feedback	✓	✓	✓	✓
Access to financing	✓	✓	✓	
Prolific community/individual ownership and use	✓		✓	
Participatory project siting	✓		✓	
Recognition of externalities or Positive public image	✓		✓	

Table 5.2: The degree of social and market acceptance for renewable electricity in Germany, United States, Denmark, and India. Source: Sovacool and Ratan, 2012

5.1.1 Socio-Political

The socio-political section of Sovacool and Ratan's framework heavily relied on institutions, legislative, and political structures, with the implication that these are all National. The nature of the Vineyard Wind project (not to mention all other large-scale offshore wind projects currently being planned for the United States) is that aside from being located in federal waters, the particulars of the project - including but not limited to political support, policies, and contracts with utilities - mostly depend on the State. If one was to define "institution" as "national" as Sovacool and Ratan tend to do, then all three of the socio-political criteria would remain virtually unmet. All of the indicators within this section that are designated as "strong" fall under state or other. To compare, only one out of three of the federal level indicators is labeled as "medium", while the other two are labeled as "weak".

This dual existence of State and Federal governments in the United States was implicitly taken into account in Sovacool and Ratan's original creation of the framework - after all, United States solar photovoltaics was one of their four case studies. In their conclusions, the researches made statements such as, "Net metering in most states in the U.S. allow solar and small-scale wind producers to sell electricity back to the grid at real-time prices, making peak production more valuable" (Sovacool and Ratan, 2012). Statements like this acknowledged the dichotomy, but arguably did not adequately expand on it. This is not to say that the framework cannot be used to assess clean energy developments in the United States, but it will be a complication

that needs to be acknowledged and discussed in analyses, especially given the size and scale of offshore wind farms.

Since publishing this piece in 2012, researcher Sovacool co-authored an article titled: “A conceptual framework for understanding the social acceptance of energy infrastructure: Insights from energy storage”, which was published in 2017. This piece acknowledges this shortcoming, stating that,

“Whilst the [2012] framework is useful for distinguishing contrasting aspects of acceptance, each involving different actors, it is weakened by a lack of emphasis upon how each dimension inter-relates across different geographical scales (from macro to micro; international, national and local).” (Devine-Wright et al., 2017)

This 2017 piece goes on to argue that a comprehensive and holistic examination of overlapping governance structures and “middle actors” would lead to a more inclusive assessment of socio-political support.

5.1.2 Market

A complication encountered in this section was that the distinctions between the three subsections of Market became blurry when talking about a project of this magnitude. This 800-megawatt wind farm is a large, grid scale development that will supply power directly into the grid. Furthermore, it is still in the planning and permitting stage so it is too early to see which groups of stakeholders will engage with it and how. The criteria were originally tested on smaller scale terrestrial renewable energy technology installations. Some examples of indicators that Sovacool and Ratan used to fulfill the market criteria from their four case studies can be seen in table 5.3.

Given the fact that this was far from a residential scale project, policy mechanisms like net metering in the US and feed-in tariff systems in Germany for example simply do not apply. Furthermore, since most of the supply chain and manufacturing is foreign rather than domestic at this point, incentives designed to encourage local production were not particularly applicable either. This resulted in a limited amount of data that could be used to populate the Market criteria, and it was difficult to separate this data into three distinct subsections given its somewhat ambiguous

Criteria	Example(s)
Strong institutional capacity	India has a national ministry of new and renewable energy The National Renewable Energy Laboratory in the United States and Risø National Laboratory in Denmark conduct research on various aspects of solar and wind energy
Political commitment	Parliamentarians Herman Scheer and Hans-Josef Fell staunchly support renewable energy as a way to revitalize the East German economy after unification Political parties in Denmark continually announce ever-more ambitious targets for wind energy in order to build a robust domestic manufacturing base
Favorable legal and regulatory frameworks	Rules in Denmark force transmission system operators to connect all renewable electricity generators to the grid independent of its cost Changes to the German feed-in tariff scheme occur transparently every four to five years with input from a broad spectrum of stakeholders
Competitive installation/production costs	Germany rewards renewable energy producers with a premium tariff above the retail market price for electricity Local production and manufacturing of wind turbines in Denmark lowers installation costs, enhances learning, and reduces risk
Mechanisms for information and feedback	Net metering in most states in the U.S. allow solar and small-scale wind producers to sell electricity back to the grid at real-time prices, making peak production more valuable Germany publishes information about policy mechanisms such as the feed-in tariff in newspapers and through free brochures
Access to financing	Various U.S. banks and government programs offer preferential financing opportunities for residential solar systems The Danish government designed and promoted a "Danish Wind Turbine Guarantee" that offered financing for projects using Danish made materials and components
Prolific community/individual ownership and use	Ninety percent of commercial wind farms in Denmark are owned by local cooperatives and individuals Roughly half a million families have installed solar panels on their homes in Germany
Participatory project siting	Trade unions, environmental groups, nongovernmental organizations, community leaders, and consumer advocates are all involved in German renewable energy permitting
Recognition of externalities or positive public image	<i>Kommunes</i> in Denmark enthusiastically embraced wind energy as an environmentally friendly alternative to nuclear power Renewable energy in Germany is credited with displacing fossil fuel imports and lowering volatile electricity prices in Germany

Table 5.3: Examples of indicators how criteria were satisfied by Sovacool and Ratan's case studies.
Source: Sovacool and Ratan, 2012

applicability. This of course informs the core question of this study, that being whether or not this framework can be effectively used to assess social acceptance of the Vineyard Wind project. The fourth and the sixth criterion can still be used as they are written now, albeit in somewhat reinterpreted or creative ways (given the juxtaposition

of a project in federal jurisdiction that is contracting with an individual state, as well as the virtually nonexistent domestic supply chain, at least for the time being).

With respect to criterion five, it is the opinion of this researcher that the criterion was poorly thought out and is flawed as it currently exists. It is defined as “*Investors and users/producers have access to reliable information about renewable energy policies, prices, and opportunities*”.

As shown in Table 5.3, feedback is defined in two ways in Sovacool and Ratan’s study; both as feeding back into the grid, like net metering, and as providing qualitative feedback as part of a system of checks and balances. Not only is this not clear in the wording of either the criterion or its definition, these are two very different meanings of the word “feedback” and they should not be used to inform the same criterion.

With respect to this study, the scale of the project (that being the fact that it is a utility-scale development in federal waters as opposed to one that is community or individually owned) is what truly shined a light on the aforementioned flaws. The only context in which this could apply to consumers would be when they are also the producers. Net metering from rooftop solar, for example, is a benefit that an individual can reap because in that context, they are both the producer and the user.

This point might be countered with the argument that there is not a problem with the criterion, but rather if a development is beyond the scale of individual ownership then it simply wouldn’t be able to qualify as “met”. This logic, however, would also be flawed. Sovacool and Ratan argue that all four of their case studies met this criterion

including both commercial wind in Denmark and India, and yet in both cases, the evidence they used to justify that this criterion had been met were based off their second interpretation of the word “feedback”. They cited that mechanisms were in place in both countries that allowed for communication between users and producers that facilitated checks and balances. While this is valuable information, it is not at all in the same category of financial incentives from feeding energy back into the grid. Overall, this seems like an underdeveloped criterion idea that should be revisited, especially because it considers some important factors, but hasn’t cohesively tied them together.

5.1.3 Community

Defining community is a difficult task when it comes to renewable energy (Walker, Devine-Wright, 2008), which only becomes increasingly more difficult when considering areas out at sea. There is no adjacent town, for example, and one must reconsider the definition of “community” and look at the area from a different perspective.

It was necessary to reimagine the common definition of community for this section. The way it was considered in this study was through users and stakeholders such as fishermen, tribes, environmentalists, and sailors in lieu of a neighborhood, for example. This reimagining of the definition of “community” allowed the criteria to translate reasonably well from land based to sea based, but there were exceptions. For example, criterion number seven, Prolific Community / Individual Ownership and Use

barely applied, and was in fact the only one of the criteria that was flat out not met.

This wasn't an issue of whether or not the criterion could be accounted for, but rather if the project could even be measured using this criterion at all. In other words, would it be possible for an offshore wind project to ever meet this?

The answer to that question remains to be seen. Community ownership of utility scale offshore wind farms seems a hard concept to envision, but it is not impossible. In 2001 the Middlegrunden Offshore Wind Farm was built off the coast of Copenhagen in Denmark and is owned half by its developers Københavns Energi and half by Middelgrundens Vindmøllelaug, a private cooperative partnership (Renewable Technology | Middlegrunden). At the time that it opened it was the largest offshore wind farm in the world, and yet a community cooperative held just as much of a stake as the developers did. Today however a twenty-turbine development with a forty-megawatt capacity is considered relatively small.

The idea of "community ownership" is not simple to define. As previously addressed, the word "community" itself is often contested when considering renewable energy, and therefore it makes sense that adding the aspect of "ownership" would only further complicate things. In 2008, researchers Walker and Devine-Wright published an article explaining the flexibility of the definition, and the fact that there is a wide range when considering levels of stakeholder participation and distribution of benefits. That said, they do give examples of what each end of the spectrum looks like, stating that a conventionally developed wind farm would represent:

“a project that has minimal direct involvement of local people and is developed by a distant and closed institution, that generates energy for the grid rather than for use in the locality and that produces economic returns for distant shareholders rather than local people.” (498)

This would be on the opposite side of the spectrum from,

“an ‘ideal’ community project, one which is entirely driven and carried through by a group of local people and which brings collective benefits to the local community (however that might be defined)—a project that is both by and for local people.”
(498)

While it may be a reach to imagine a utility-scale offshore wind farm ever being able to measure up entirely to the second example, there certainly exists the possibility that one could land somewhere along the spectrum. Middlegrunden is an example of this. While it is much more community-oriented than most offshore wind farms, it was not universally desired, and there existed a group of yachtsmen, fishermen, individuals and politicians who were opposed to the project (Haggett, 2011). The Vineyard Wind farm, however, matches Walker and Devine-Wright’s definition of a conventionally-developed wind farm virtually word for word, and cannot be considered “community owned” by any stretch of the definition.

This should in no way be seen as a criticism of the framework or its criteria. The fact that community is hard to define with respect to offshore wind energy does not mean that the idea of community ownership should be viewed as not applicable when considering offshore wind farms. Rather it could be argued that it is imperative that the criterion be considered, as it helps highlight this issue.

5.2 THE SLIDING SCALE OF SUPPORT

Something that jumped out almost immediately while analyzing the data obtained during the interview process was the fact that the nine criteria would not be able to be simply checked off or not. The framework initially appeared to be a straightforward checklist with criterion which either could or could not be accounted for. Upon further inspection however, determining if a criterion had been met proved to be more about deciding if there were enough indicators that could show proof of support and then determining if these identified indicators were sufficiently strong or substantive enough.

The “strength” column in Table 5.1 attempted to address this. Some indicators or evidence of support brought forth during interviews were clearly stretching the definition, like the representation-by-proxy argument offered up in criterion seven. Others were seen by some to have not mattered at all, like in the case of how commercial fishermen felt that their opportunities for participation in the siting process were simply a formality; that the developers were simply checking a box. Many participants also expressed frustration over the accessibility of information, stating that while technically the process was “transparent”, it was impossible to follow along with the meetings, hearings, and comment periods, and that staying informed meant wading through legal jargon and technical documents they were unable to understand.

The only criterion that was categorically determined to be unmet was number seven, Prolific Community / Individual Ownership and Use. Every other criterion technically had enough evidence of support present to the point that they were all,

arguably, able to be met. That said, the strength of the indicators varied widely and were highly up for debate. Especially in criteria eight, Participatory Project Siting, there were staunch disagreements about how much public opinion was genuinely taken into account versus whether it was just for show. The fact that a criterion is technically satisfied does not necessarily mean that the situation is resolved. A quick look at a chart that shows eight out of nine criteria as being met with respect to the Vineyard Wind project could very likely lead someone to the incorrect assumption that the project is generally supported with little contention.

This failure to prominently acknowledge a sliding scale of support is a major oversight by Sovacool and Ratan, one which has the potential to influence or distort results of studies that use their framework as a foundation. The researchers came close to discussing the idea when they stated in their 2012 study that acceptance is treated as something relative and different from diffusion, and that accounting for each aspect of the framework does not facilitate absolute acceptance but rather an accelerated rate of diffusion (Sovacool and Ratan, 2012). In other words, they concede that the criteria is not infallible, but rather a useful measuring tool which helps gauge how well a project might integrate into a community. What they do not account for, however, is the spectrum of opinion about the true strength of the indicators they used to populate their framework. This is a shortcoming which arguably needs to be looked into further. Despite the fact that the framework was revisited in the 2017 and some aspects were rethought, any contemplation around evaluating the strength of particular indicators of

support, or acknowledging variances in stakeholder opinions was once again not considered.

It is important to recognize the nuances of why wind farms might be met with resistance. An article published in 2009 outlines five common assumptions about how the public perceives wind power. They are as follow:

1. The majority of the public supports wind power.
2. Opposition to wind power is therefore deviant.
3. Opponents are ignorant or misinformed.
4. The reason for understanding opposition is to overcome it.
5. Trust is key.

(Aitken, 2010)

The article goes on to explain how any discourse regarding wind farms (on- or offshore) that rests on these assumptions will be misguided and will hinder a fuller understanding of community acceptance. Not only do these viewpoints suppress critical thinking and informed discussion, the author argues, but allowing them to shape the narrative gives a disproportionate amount of credibility to whoever holds them, while unfairly discounting any dissension. This has the effect of imagining one side as right and the other wrong, and this determination of rightness creates the illusion that one person is the expert, while the other is simply mistaken.

The sort of thinking introduced in the Aiken piece leads into the argument that the idea of NIMBYism carries connotations of selfishness which in turn invalidates any objections one might have (Wolsink, 2000, Lake, 1993), while in reality objections can be extremely valid, not to mention nuanced, complex, and multi-layered.

A more accurate way of looking at the individuals who expressed degrees of antipathy is by considering what type of resistance was being encountered. In an article titled: “Wind Power and the NIMBY-Myth: Institutional Capacity and the Limited Significance of Public Support” (Wolsink, 2000), the reader is introduced to four different types of resistance. Each of the four is distinctly different, and yet all (unfortunately) often get lumped into the NIMBY category - a label which, as previously stated, carries with it a negative stigma. The last type is defined as,

“Resistance created by the fact that particular projects are considered faulty, without a rejection of the technology as a whole. This type advocates the generation of wind power, but only under some conditions. This opposition is particularly limited to proposed wind farms on specific locations, as it is based on concerns about the consequences of a wind power plant, on primarily the scenery and, to a lesser degree, on interference and nuisance. People here may be unconvinced about the suitability of the selected site. They may expect interference or they may consider the landscape on the chosen location too sensitive, especially when other available locations nearby are considered more suitable.” (Wolsink, 2000)

This explanation fits the type of concerns expressed by some of the more skeptical participants in this study. While there are some individuals who staunchly object to offshore wind no matter what, it is far more common to hear concerns that were grounded, genuine, and specific to the area in question but did not categorically dismiss offshore wind as a whole.

5.3 DETERMINATIONS

The goals of this study were: 1) To assess levels of acceptance in MA per the framework both with respect to the Vineyard Wind project and offshore wind energy in

general, 2) To determine if this framework can be effectively used with respect to the Vineyard Wind development, and 3) To provide early insights into whether or not this framework can be effectively used with respect to utility-scale offshore wind developments in general.

5.3.1 An Assessment of Massachusetts

Using the framework as a guide, it is the opinion of this researcher that Massachusetts as a state is, on the whole, receptive to the idea of the Vineyard Wind project and to offshore wind energy. The data collected through interviews and supplementary research into Massachusetts policies, programs, and incentives shows that at a socio-political level there is strong legislation and supportive politicians, while at the market level there is a robust renewable energy sector, and systems in place that facilitate relative ease of entry for developers. Finally at the community level, the data shows that there is overall positive sentiment towards renewable energy production among key informants, as well as (for the most part) a desire to see the project created. Considering this, one might assume that the project was moving along, and yet that is not the case.

Despite this overall state-level enthusiasm, major barriers to the development of Vineyard Wind still exist. This past summer the federal government unexpectedly delayed the project, calling for a comprehensive “cumulative impacts statement” (Vineyard Wind | BOEM). This delay came as a shock not only to developers but to all those who were following the progress, but perhaps it should not

have. The ultimate go-ahead for development of the project lies with the federal government who, as previously stated, is relatively ambivalent towards offshore wind development. The current administration maintains that their decision to delay the project is not politically motivated, and that they are simply trying to exercise caution, an attitude that was echoed by BOEM Acting Director Walter Cruickshank when he stated that,

“In our draft EIS [environmental impact statement], we looked relatively narrowly at existing plots that we had in place and existing PPAs for what was reasonably foreseeable. Since that draft EIS was published [in late 2018], it seemed almost weekly there were new announcements from states about their new goals and new RFPs.”
(Stromsta, 2019).

This inconsistency between state and federal priorities interests is, as previously stated, not adequately reflected in the criteria, and the framework would not be able to predict this. This poses the questions; how adequate are the criteria for measuring the Vineyard Wind project and offshore wind energy in general?

5.3.2 An Assessment of the Framework

First and foremost it must be stated that this framework is an excellent tool overall for measuring acceptance of renewable energy developments. Each criterion demands that a researcher look at a project from a unique perspective and allows for a comprehensive understanding of the specific case they are studying. By addressing the following three aspects, it is the opinion of this researcher that the framework could be

effectively used to assess social acceptance of the Vineyard Wind project specifically, but also offshore wind energy developments in general.

Firstly, the framework does not adequately allow for nuance or a spectrum of opinion. Therefore, it is the opinion of this researcher that there should be another criterion added to the framework. The purpose of this would be to contextualize opposition opinion. The criteria are looking to see if something is present, but this criterion would be concerned with making sure opposition was not present. The title could be along the lines of: An Absence of Opposition Groups, with a description like “There are no organizations or groups who express resistance to the project, particularly the chosen location, for reasons including but not limited to concerns over the natural environment, the historical significance, or accessibility to the area.” This would incorporate the previous ideas about types of resistance, and would allow for a more accurate and realistic look at the nuances and complexities of the situation and would have been able to capture a lot of the contention during Cape Wind and the current controversy over commercial fishing interests

Secondly, criterion five as it currently exists is problematic and needs to be restructured. “Mechanisms for Information and Feedback” needs to be more clearly thought through, and the scope of what the researchers are looking for needs to be redefined.

Third and finally, the definition of “institution” needs to be revisited. The socio-political section of Sovacool and Ratan’s framework heavily relied on institutions, legislative, and political structures, without adequately acknowledging dual existence of

State and Federal governments in some countries including the United States. The nature of the Vineyard Wind project (not to mention all other large-scale offshore wind projects currently being planned for the United States) is that aside from being located in Federal waters, the particulars of the project - including but not limited to political support, policies, and contracts with utilities - mostly dependent on the state. This dichotomy was taken into account in Sovacool and Ratan's original creation of the framework - after all, United States solar photovoltaics was one of their four case studies, but it was not adequately expanded on. This issue has been addressed since, as was previously stated, when researcher Sovacool was a contributing author on the 2017 article published by Devine-Wright et al. Inclusion of "middle actors" as discussed would allow for a wider definition of the word "institution" which could include state and local governments.

5.4: RECOMMENDATIONS FOR FURTHER STUDY

Suggestions for further research based on this study are:

1. Conduct a similar study once this (or a handful) of offshore wind developments are up and running along the east coast to see how results would change based on: a) The physical presence, b) Actual versus theorized effects and operations, and c) Geography (if studies were being conducted in multiple locations).
2. Engage in an in-depth examination into whether or not this framework can be effectively used to measure large scale offshore wind farms in general.

APPENDICES

Appendix A: Recruitment Scripts

1. EMAIL RECRUITMENT

Dear [*insert name*],

My name is Jamie Buck and I am a graduate student from the department of Marine Affairs at the University of Rhode Island (URI). I am writing to invite you to participate in a URI research study, the purpose of which is to gain insight into public acceptance of offshore wind energy development in Massachusetts. You are eligible to participate in this study because through your involvement with [*insert their professional, recreational and/or social affiliation*], you represent a member of the public who is particularly connected with and informed on the establishment of offshore wind energy in Massachusetts. I obtained your contact information from [*describe source*].

If you decide to take part in this study, you will participate in an interview lasting no more than 45 minutes in a location of your choosing, during which we will discuss offshore wind energy from socio-political, market, and community perspectives. Your personal information will be kept confidential, and you reserve the right to terminate involvement at anytime. You will not receive any benefits as a result of this study. You must be 18 years or older to participate in this study. With your permission I would like to audio record your interview in order to transcribe our discussion and subsequently develop accurate conclusions.

Remember, this is completely voluntary. If you would like to participate or have any questions about the study, please email or contact me at jamieb214@my.uri.edu or by phone at 617-921-0327. This research has been approved by The University of Rhode Island Institutional Review Board

Thank you very much.

Sincerely,

Jamie Buck, Graduate Student Researcher, and

Dr. David Bidwell, Principal Investigator

2. PHONE RECRUITMENT

Hello, my name is Jamie Buck. I'm calling from the University of Rhode Island about a research study. Am I speaking to _____ (name of recruit)?

If “no,” wait for recruit to pick up, arrange to leave a message, or ask for a time to call back. If “yes”:

I got your phone number from _____ (describe contact source). Is this a good time to talk? I expect this phone call will take about ten minutes.

Arrange to call at another time, if appropriate.

I'm calling to see if you would be interested in participating in a research study being conducted by the University of Rhode Island, the purpose of which is to gain insight into public acceptance of offshore wind energy development in Massachusetts. I am reaching out to you today because through your involvement, be it professional, recreational and/or social, you represent a member of the public who is particularly connected with and informed on the establishment of offshore wind energy in Massachusetts.

So long as you are 18 years of age or older you are eligible to participate. If you decide to be involved, you would take part in a semi-structured interview lasting up to 45 minutes in a location of your choosing. Does this sound like something you would be interested in participating in?

Leave time for response. If “no”, thank them for their time. If “yes”, continue:

That's great, so before we go on, let me tell you a little bit about your rights as a research subject. The main risk of participating in an interview is loss of confidentiality. However, we will do our best to keep your information confidential. With your consent I would like to audio record the interview, however this is not a requirement for participation. We keep all transcriptions and audio recordings (if there are any) on a password protected computer and/or external hard drive, and will destroy them after three years. Informed consent forms will be kept in a locked filing cabinet in the Marine Affairs office at the University of Rhode Island.

So finally the last step will be coordinating a time and place to meet that works for you.

Leave time for response - schedule a time and place or allow for them to email with options.

If you have questions about the study, you can call reach me at 617-921-0327, or by email at jamieb214@my.uri.edu. If you have questions about your rights as a research subject or research-related injuries, you can call the URI Research Integrity Office at (401) 874-4328.

Thank you so much for your time, and I look forward to meeting you. Have a great day.¹

¹ Modified script from Oregon Health and Science University. Original script: <http://www.ohsu.edu/xd/research/about/integrity/irb/upload/Telephone-Recruitment-and-Screening-Script-FINAL-1-24-2014.docx>

Appendix B: Interview Protocol

This script acts as a guide rather than a hard and fast set of questions which must be asked. The goal of the interview is to allow for new ideas to be brought up and for conversations to evolve and expand naturally.

1. Socio Political

i. Strong institutional capacity

1. Which if any organizations involved in offshore wind energy development are you familiar with?
2. Are you in any way affiliated with any of these organizations?
3. Do you feel that the idea of offshore wind energy development has support from these entities?

ii. Political commitment

1. Are you familiar with the viewpoints of any politicians (local, state, and/or federal) with regard to offshore wind energy development? If so, please expand.

iii. Favorable legal and regulatory frameworks

1. Are you familiar with any legislation surrounding offshore wind energy development (local, state, federal)?
2. Do you feel that it truly supports offshore wind energy development?
3. Do you feel that offshore wind energy development is too strongly supported? Not strongly enough?

2. Market:

i. Competitive installation/production costs

1. Do you feel that wind energy will be financially risky in any way?
2. Do you feel that the implementation of offshore wind energy structures has enough support? Too much support?

ii. Mechanisms for information and feedback

1. Do you have any thoughts on the transparency of the process?
2. Do you feel that there is an adequate framework in place to inform the public on policy mechanisms?

iii. Access to financing

1. Are you familiar with any aspects of the supply chain?
2. Do you feel that the costs of offshore wind energy development are reasonable?
3. Do you feel like there is healthy market competition?
4. Do you think offshore wind will be affordable to Massachusetts consumers?
5. Do you feel satisfied with the local, state, and/or federal role in the installation/production?

3. Community:

i. Prolific community/individual ownership and use

1. Do you feel that the citizens of Massachusetts will have an adequate stake in the control and/or management of the wind farm?

ii. Participatory project siting

1. Are you familiar with the process of how this project was sited?
2. Do you feel that there was adequate room for citizen input?
3. Do you feel that the input received was taken into account to an acceptable degree?
4. Do you feel that any groups/individuals/entities were underrepresented or overrepresented in the siting process?
5. Do you feel that any groups/individuals/entities are worse off in any way because of the siting process?

iii. Recognition of externalities or positive public image

1. Do you feel that there is a positive sentiment toward renewable energy among the citizens of Massachusetts?

Appendix C: Consent Form

<p>THE UNIVERSITY OF RHODE ISLAND</p> <p>COLLEGE OF THE ENVIRONMENT AND LIFE SCIENCES</p>	<p>THINK BIG WE DO™</p>
<p>DEPARTMENT OF MARINE AFFAIRS 1 Greenhouse Road, Suite 205, Coastal Institute Building, Kingston, RI 02881 USA p: 401.874.2596 f: 401.874.2156 cels.uri.edu/maf</p>	
<p>Consent Form for Research</p>	
<p>STUDY TITLE Indicators of public acceptance of offshore wind energy development in Massachusetts</p>	
<p>PRINCIPAL INVESTIGATORS</p> <p>Principal Investigator: Dr. David Bidwell, Office: (401) 874-5708 Email: dbidwell@uri.edu</p>	
<p>KEY INFORMATION</p> <p>Important information to know about this research study:</p> <ul style="list-style-type: none">• This goal of this project is to understand current thinking of stakeholders regarding the Vineyard Wind offshore energy development for Massachusetts.• If you choose to participate, you will be asked to participate in a semi-structured interview at a location and on a date and time of your choosing. This will take approximately 45 minutes.• Risks or discomforts from this research are minimal.• You will be provided a copy of this consent form.• Taking part in this research project is voluntary. You don't have to participate and you can stop it any time.	
<p>Why are you being asked to be in this research study?</p> <p>You are eligible to participate in this study because through your involvement, be it professional, recreational and/or social, you represent a member of the public who is particularly connected with and informed on the establishment of offshore wind energy in Massachusetts. You must be 18 years of age or older to participate.</p>	
<p>What is the reason for doing this research study?</p> <p>While offshore wind energy development is already well underway across Europe, the industry is only just beginning to gain traction in the United States. Analysts of wind energy agree that further successful installation of renewable energy technologies depends on social acceptance. <small>The University of Rhode Island is an equal opportunity employer committed to the principles of affirmative action.</small> This project will evaluate the current conditions in Massachusetts and conclude with an assessment of the State's readiness.</p>	
<p>THE UNIVERSITY OF RHODE ISLAND <small>(COLLEGE OF ENVIRONMENT AND LIFE SCIENCES)</small></p>	<p>IRB NUMBER: 1 of 4 HU1819-012 IRB APPROVAL DATE: August 15, 2018 IRB EXPIRATION DATE: August 15, 2019</p>

What will be done during this research study?

You will be asked to partake in a 45 minute semi-structured interview in a location of your choosing. This interview will be recorded, pending your consent.

How will my data be used?

The audio recordings of your interview will be transcribed for analysis. These recordings and transcriptions will remain on my password protected computer and/or password protected external hard drive. Signed consent forms will remain in my locked filing cabinet in the Coastal Institute building on the University of Rhode Island Kingston campus. All recordings and transcriptions will be destroyed after three years.

What are the possible risks of being in this research study?

This research presents risk of loss of confidentiality, emotional and/or psychological distress because the surveys involve sensitive questions about your work habits.

What are the possible benefits to you?

You are not expected to get any benefit from being in this study. This study aims to identify the social climate of Massachusetts with respect to the development of offshore wind energy and its findings could prove beneficial in further research in the field.

What will being in this research study cost you?

There is no cost to you to be in this research study.

What should you do if you have a problem during this research study?

Your welfare is the major concern of every member of the research team. If you have a problem as a direct result of being in this study, you should immediately contact one of the people listed at the beginning of this consent form.

What are your rights as a research subject?

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study.

For study related questions, please contact the investigator(s) listed at the beginning of this form.

For questions concerning your rights or complaints about the research contact the Institutional Review Board (IRB) or Vice President for Research and Economic Development:

IRB NUMBER: 2 of 4 HU1819-012
IRB APPROVAL DATE: August 15, 2018
IRB EXPIRATION DATE: August 15, 2019

- IRB: (401) 874-4328 / researchintegrity@etal.uri.edu.
- Vice President for Research and Economic Development: at (401) 874-4576

What will happen if you decide not to be in this research study or decide to stop participating once you start?

You can decide not to be in this research study, or you can stop being in this research study ("withdraw") at any time before, during, or after the research begins for any reason. Deciding not to be in this research study or deciding to withdraw will not affect your relationship with the investigator or with the University of Rhode Island.

Documentation of informed consent

You are voluntarily making a decision whether or not to be in this research study. Signing this form means that (1) you have read and understood this consent form, (2) you have had the consent form explained to you, (3) you have had your questions answered and (4) you have decided to be in the research study. You will be given a copy of this consent form to keep.

Participant Name:

(Name of Participant: Please print)

Participant Signature:

Signature of Research Participant

Date

AUDIO/VIDEO ADDENDUM TO THE CONSENT FORM FOR RESEARCH

By signing this consent form, I confirm that I give my permission for audio recording(s) of me, to be used for the purposes listed above, and to be retained for three years. You may still participate in this study if you are not willing to be recorded.

Printed Name of Participant

IRB NUMBER: 3 of 4 HU1819-012
IRB APPROVAL DATE: August 15, 2018
IRB EXPIRATION DATE: August 15, 2019

Signature of Participant

Date

Printed Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date

Please sign both copies of this form, return one copy to the researcher, and keep one copy for your records.

IRB NUMBER: 4 of 4 HU1819-012
IRB APPROVAL DATE: August 15, 2018
IRB EXPIRATION DATE: August 15, 2019

Appendix D: NVivo Codebook

Codebook			
	Name	Sources	References
1	1_Socio Political	10	50
2	1-1	10	22
3	1-2	10	11
4	1-3	9	17
5	2_Market	10	43
6	2-1	10	14
7	2-2	10	14
8	2-3	8	8
9	3_Community	10	50
10	3-1	10	11
11	3-2	10	26
12	3-3	10	11
13	Cape Wind reference	7	16
14	Criticism and or opposition	2	2
15	Commercial fishing	3	10
16	Environmental or Ecological	2	2
17	Habitat impacts	1	1
18	Lack of research	1	2
19	Misc	2	3
20	Good quote	2	2
21	Issues with the process	9	34
22	Key words or phrases	0	0
23	Federal tax credit	5	9
24	Power Purchase Agreement	3	4
25	Praise and or support	2	2
26	Economical	6	10
27	Misc	7	23
28	Renewable energy or climate change solution	6	12

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