



# The Frontier Myth in U.S. Offshore Wind Energy Communication

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Increased penetration of low-carbon energy technologies, such as wind and solar, into the U.S. energy system has the potential to reduce greenhouse gas emissions, facilitate transmission of energy to remote regions, and increase opportunities for public participation in energy system change. It also offers a window of opportunity to observe the social dynamics of rapid socio-technical system change. Studying internal, yet informal, communication among energy professionals enables communication researchers to probe processes and practices of identity composition, which may, in turn, suggest opportunities to shift the relationship between energy professionals and energy consumers away from alienation and toward consubstantiation. With this goal in mind, we analyzed communication among U.S. offshore wind professionals—specifically energy scientists and engineers—at professional conferences. Textual analysis of conference presentations and ethnographic interviews indicates that scientists and engineers working with the nascent U.S. offshore wind industry are composing an identity inspired by the frontier myth. We suggest that these evocations of the frontier myth might be strategically used to cultivate consubstantiality between technically-oriented energy professionals and publics. Awareness of a common connection to frontier myth may contribute to public engagement with offshore wind energy specifically, and more generally, with low-carbon energy technologies.

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## INTRODUCTION

Climate change is widely recognized as an ongoing environmental crisis (Cox, 2007; Endres et al., 2016). Wind energy, among other low carbon energy technologies (LCETs), offers a means to mitigate the rate of climate change by reducing the need for extractive, non-renewable, and contaminating energy resources. Although onshore wind energy has been deployed successfully in the U.S. for decades, particularly in Texas, the U.S. offshore wind industry is underdeveloped when compared to its onshore counterpart and to the European offshore wind industry (Gilman et al., 2016).

For this paper, our primary goals were to identify a central concept that informs the emerging cultural identity of U.S. offshore scientist and engineering professionals, and to explore how that concept is articulated in *in situ* LCET professional communication. Using texts from our ethnographic observations at offshore wind science and engineering conferences, this analysis of identity composition among U.S. offshore wind energy scientists and engineers (*offshore professionals* hereafter) disclosed the centrality of the frontier myth

in their internal expert-to-expert talk. Offshore professionals articulated their professional identity and that of their industry as pioneering new technology that would allow the U.S. to reach a new frontier in energy transition. We recognize that the U.S. frontier myth is grounded in historical and ongoing violent colonial and racial relations and that we must use care in approaching offshore professionals' use of this myth. Approaching the frontier myth critically and attending to the environmental justice implications of all energy technologies can help practitioners and scholars maintain a degree of reflexivity in its use.

We begin by referencing the call for more study of internal science communication emerging from rhetoric of science (RoS) and science, technology, and society (STS) scholarship while outlining the niche to which our study contributes. We then briefly review the frontier myth as used throughout U.S. history, highlighting pertinent concepts such as wilderness, heroism, colonialism, and frontier imagery. Third, we describe our methods of data collection and analysis. This is followed by a report of the diverse ways U.S. offshore professionals are composing a cultural identity that evokes imagery and values drawn from frontier mythology. In this section, we identify three recurring themes from our analysis: (1) building from a European legacy; (2) stewardship through technological prowess; and (3) expansionist ambitions that were employed throughout U.S. offshore professionals' internal rhetoric. Finally, we discuss the implications of our findings for animating a sense of common purpose between offshore wind professionals and end users of the electricity they produce via the frontier myth, enabling one strategy for what Kenneth Burke called "consubstantiation" between LCET professionals and publics (Burke, 1969). We offer the insights developed herein to promote better communication between offshore professionals and publics with the caveat, as articulated by Ceccarelli (2013a), that unmindful use of the frontier myth by scientists can be problematic.

## THE FRONTIER MYTH IN INTERNAL SCIENTIFIC RHETORIC

### Studying Science Beyond Publication and the Laboratory

Expert-to-expert communication, or what has been called internal rhetoric of science, has been of interest to rhetoricians at least since Wander's (1976) seminal article crystallizing the field of RoS. Central to RoS research is the notion that a scientific text can be analyzed as "a literary artistic product" (Gusfield, 1976, p. 16). This opened science studies to rhetoricians by emphasizing that scientists continually find themselves in the role of rhetor as they attempt to persuade each other, whether that be whilst seeking funding, presenting their results at professional meetings, or publishing noteworthy findings (Ceccarelli, 2001). As their audiences may include a wide variety of actors, scientists must eventually speak to broader institutions, including those they depend on for funding.

Some scholars have cited the institutional foundations of science as limiting the value of rhetorical critique, as rhetoricians

may assume a greater degree of agency for speakers/authors than is appropriate given their institutional ties (Ceccarelli, 2001). Ceccarelli (2001), however, maintains that RoS scholars may fruitfully analyze scientific rhetoric provided they balance their focus appropriately between the text and its institutional context. To ensure that this study of the emergent identity of offshore professionals thoroughly contextualizes professional rhetoric within its social milieu, we used the Socio-Political Energy Deployment framework (SPEED) (Stephens et al., 2013), further outlined in the methods section, to account for economic, institutional, cultural, and political realities faced by these professionals.

Wander and Jaehne explicitly affirm the rhetorical exigence provided by science and technology by recognizing the need for "continued research in areas where science enters into arguments over public issues" (Wander and Jaehne, 1991, p. 216). Energy technologies illustrate this exigence as they directly affect human health (Brook, 2008), electricity costs (Stephens et al., 2014), land rights (Martin, 2007), sovereignty and self-determination (Endres, 2009; Clarke, 2010), and colonial political dynamics (de Onís, 2018). Additionally, as rhetorical scholars have noted, discourse that shapes decisions about energy technologies is propelled by political ideologies (Schneider et al., 2016; Schneider and Peeples, 2018). The intrinsically ideological dimension of research, development, and implementation of energy technologies suggests that studying the internal rhetoric of LCET scientists and engineers working with energy system change has potential to provide energy professionals, policy makers, and publics with a heuristic that enables more productive navigation of this politically complex terrain.

However, as Ceccarelli notes, many RoS scholars have consciously chosen a "somewhat passive" (Ceccarelli, 2013b, p. 2) role in the study of science, reserving politically relevant action to teaching and extra-academic activities. Environmental communication scholars (Endres et al., 2008; Sprain et al., 2010; Sprain and Feldpausch-Parker, 2018) and energy communication scholars (Cozen et al., 2018), on the other hand, argue that their sub-discipline's status as a crisis discipline (Cox, 2007) requires a more active orientation that seeks to apply heuristic contributions to policy, activism, or other forms of response to ongoing crises.

Scholars of Science, Technology and Society (STS) wishing to contribute to an "engaged paradigm," which balances theoretical depth and advancing concrete goals, share a similar position (Sismondo, 2008) on contributing insightful research with practical applications. Research on the internal workings of scientific rhetoric, particularly expert-to-expert *in situ* rhetoric, contributes directly to ongoing efforts to increase the transparency of STS scholarship (Fuller and Collier, 2003; Sismondo, 2008; Latour, 2010). Central to this stream of STS research is an effort to bridge incommensurability between non-scientist publics and technical experts provoked by technical jargon and tacit technocratic values attributed to this elite group that may unnecessarily alienate publics (Darsey, 2002). Analysis of expert-to-expert scientific rhetoric can contribute to making scientific knowledge more accessible and scientists more accountable to publics. That is, it may open a window that both

enables and encourages people who ordinarily operate outside of the technical sphere to interact with and begin to develop trust in LCET professionals during and beyond deployment of energy projects.

Our research, then, operates from the perspective that applied research within the field of communication may yield both theoretically and practically relevant contributions. In the present study, we aim to contribute to a deeper understanding of the emergent identity shared by offshore professionals in a relatively young industry, while pointing out ways that understanding may facilitate relations between LCET professionals and the broad spectrum of energy publics.

In addition, our study directly responds to calls for research on the internal communication among energy professionals (Endres et al., 2016; Cozen et al., 2018). We chose to study offshore wind experts exclusively because internal communication of energy scientists and engineers has been undertheorized in the field of energy communication (Endres et al., 2016). Attending to this gap adds dimensionality to the field of energy communication, which has relied largely on studies of mediated messages addressed to publics. These analyses often focus on what happens *after* expert decisions have been made, particularly those associated with environmental crises (Endres et al., 2016). The present study deviates from this path in that it examines internal rhetoric of offshore professionals in the U.S., focusing on the emergence of a professional cultural identity within that nascent industry. We seek not only to deepen understandings of the reasoning demonstrated in the rhetoric of offshore professionals within this context, but also to examine the potential for facilitating consubstantiality between energy professionals and publics through the serendipitously shared frontier myth.

## The Pervasiveness of the Frontier Myth

Myths are integral to the composition and lived experience of any group's identity (Rushing, 1983; Dorsey, 1995). Like most normative myths, the frontier myth centers on a narrative where the hero, who embodies the principles and values a culture should hold, ventures into the wilderness to transform it (Dorsey, 1995). The Puritan's fear of the danger posed by extreme freedom found in wilderness led them to focus on the necessity of its subjugation (Nash, 2001). Other readings grant wilderness a broad, heuristic value as an untainted place to create a better society. Myths such as the Exodus, "established a tradition of going to the wilderness for freedom and the purification of faith" (Nash, 2001, p. 16). This pastoral ideal required the removal of risk from a wilderness perceived as unsettled to bring forth the "tranquility, peace, and contentment" (Peterson, 1990, p. 11) promised in an Edenic society. Despite the ongoing presence of Native indigenous communities, European settlers saw the North American continent as an empty space where they could escape their constrained and often impoverished context in Europe. The frontier myth centers a worldview embedded in imperialism that belies the lived experience of the indigenous peoples already occupying the land.

Tales of mythical heroes in the wilderness glorify the values of bravery, ruggedness, and individualism, as well as spiritual purity, ingenuity, and stewardship (Smith, 1950; Dorsey, 1995; Nash,

2001; Slatta, 2010; Jones, 2011). In addition to the dominant image of the cowboy (Slatta, 2010), frontier heroes in the U.S. context also appear as the Jeffersonian yeoman farmer (Smith, 1950; Peterson, 1990), whose stewardship role requires physical strength, independence, and mindfulness toward nature. These yeoman frontier figures are valued because of their ability to harmonize with nature (Goodwyn, 1971). The ability to simultaneously hold the stewardship of the yeoman farmer and the ruggedness of the cowboy positions the frontier hero to "conform to some degree to the needs of the community" and save it from devastation (Dorsey, 1995, p. 4).

The frontier myth has been the subject of much deliberation by historians and communication scholars (Rushing, 1983; Slotkin, 1985; Peterson, 1990; Dorsey, 1995; Slatta, 2010; Jones, 2011), and it remains a ubiquitous and controversial referent in contemporary culture. Scholars (Short, 1989; Dorsey, 1995; Tirman, 2009) have noted that U.S. presidents continue to evoke and invoke the frontier. Theodore Roosevelt, who was known for his efforts to replace timber barons and market hunters with forest managers and hunter-conservationists, was named a frontier hero (Dorsey, 1995). Moreover, Kennedy (1962) built enthusiasm for exploring outer space by dubbing it as the final frontier, and Donald Trump has built from that metaphor in his directive for the military to establish a "space force as the sixth branch of the [U.S.] armed forces" (Trump, 2018, para. 10).

Although the resilience of frontier mythology in U.S. culture may be one reason Kennedy's Final Frontier was so effective, detailed study of scientific rhetoric indicates that the "ongoing power and reach" of the frontiers of science metaphor (Ceccarelli, 2013a, p. 5) is at least as important. She notes that a preponderance of scientific rhetoric constructs an "image of a hardy, risk-taking, self-reliant American identity and eras[es] anything that might run counter to such a vision" (Ceccarelli, 2013a, p. 10). She argues that "this metaphorical frontier of science was introduced as a compelling rhetorical substitute for the vanished American terrestrial frontier, and it has been serving in that function ever since in the public discourse of American scientists and politicians" (Ceccarelli, 2013a, p. 11). Along with other endeavors requiring significant public support, science relies heavily on the myth of the frontier in constructing the frontiers of science metaphor. Given the staying power of the frontiers of science metaphor, it is no wonder that energy professionals who are discovering and developing new techniques for producing and transmitting energy position themselves as pioneering in the frontiers of offshore wind technology alongside engineers who built skyscrapers that enabled dense human settlement in economically desirable locations, dam builders (and policy makers) that opened new agricultural production, and astronauts preparing to explore Mars.

It is crucial to understand that, at least in U.S. readings, the frontier is characterized by both risk and opportunity, and its heroes may be both audacious adventurers and solemn stewards (Slotkin, 1985). These two characterizations of the wilderness have operated simultaneously; with the goal of taming or subduing the dangerous wilderness central to the first, and the goal of achieving harmonious stewardship with nature central to

the second (Dorsey, 1995; Jones, 2011). Adding to the complexity of the frontier myth is its tendency to be pervasive in the face of incongruence. That is, “despite their inconsistency with current scenes, frontier images continue to inform” worldviews commonly observed in the United States (Peterson, 1990, p. 10). In this study, we explore how offshore wind professionals have begun painting themselves as contemporary frontier heroes.

## METHODS

Our study of the expert-to-expert rhetoric of offshore professionals began with using the SPEED framework to identify how offshore wind scientists and engineers talked among themselves about the social and technical aspects of offshore wind technology at professional conferences (Stephens et al., 2008, 2013). SPEED, which is theoretically derived from Luhmann’s (1989) theory of social systems, is an interdisciplinary systemic approach for examining system level energy change that recognizes and includes the intertwined nature of both social—cultural, economic, environmental [science], legal-political—and technical functions in sociotechnical change. We chose to conduct analysis with SPEED because it required us to look at the communication of these experts holistically and iteratively. SPEED is broad enough to allow for themes to emerge inductively in the data while also offering an initial set of factors that influence energy transitions. In this case, SPEED allowed us to hone in on the culture factor as a window into identity while avoiding pre-conceived notions of how our participants might communicate. The frontier myth emerged out of our analysis of the data coded in the culture node in the SPEED framework, which allowed us to understand how scientists and engineers defined their cultural identity as professionals within the offshore wind community. This analysis grew out of our curiosity about (1) how offshore wind professionals used communication to simultaneously describe and shape an emergent identity, and (2) how that identity complemented (or not) culturally ingrained identities among the U.S. public. In the next few sections, we will further detail our data collection and analysis.

## Data Collection and Processing

Our data for this study is the expert-to-expert rhetoric of LCET scientists and engineers, specifically offshore wind scientists and engineers. We collected data through ethnographic observation at professional wind energy conferences held from February 2015 through November 2016<sup>1</sup>. These conferences provided a forum for technical discussion focused on wind energy development in the United States, with some discussion of its relationship to international development. Most participants were natural (both physical and life) scientists and engineers, what we termed “offshore professionals” above. Their research spanned the wind energy industry, including (a) conducting

environmental impact analyses, (b) studying topics such as the impact of turbulence, the aerodynamic properties of turbine blades, and the effects of high frequency sound on migrating marine mammals, and (c) designing new technologies such as floating foundations for offshore wind facilities. A smaller group, mostly project developers and government officials, focused on policy, permitting, and supply chain.

While attending the first conference, we noticed that those who worked in the offshore wind industry eagerly described their participation in a relatively unexplored U.S. energy sector as a grand adventure. Because we wanted to further explore this form of identity construction within offshore professionals, for this paper, our data set included only utterances from offshore wind professionals with at least a bachelor’s degree in engineering or natural sciences who currently work in the field of wind energy development. We excluded participants (including those who had such a degree) who were not currently working in technical aspects of the industry (e.g., policymakers) because of our specific focus on scientist and engineer communication practices within energy communication. This gave us 23 interviews and 41 conference sessions.

Several types of presentations, ranging from individual talks to panel discussions (*sessions* hereafter), were digitally recorded to capture the rich *in situ* discourse that may be absent from more formal texts (Middleton et al., 2015). These could include jokes among presenters and comments that hold cultural value for offshore professionals but would not be found in publications or official documents (Middleton et al., 2015; Horton et al., 2016). We also conducted and recorded ethnographic semi-structured interviews with both participants who had given formal presentations and those who had not. We employed informant directed interviewing with broad questions concerning the wind industry to encourage informants to introduce and explore their own values and beliefs (Peterson et al., 1994).

After audio recordings of the sessions and interviews were transcribed, the research team reviewed transcripts for accuracy, separated text into individual utterances as the unit of analysis, and created a unique label for each utterance. Finally, the transcripts were reviewed one last time before being entered into NVivo 10 qualitative software (QSR International, Doncaster, Victoria, Australia).

## Coding and Textual Analysis

We began our analysis with a comprehensive examination of the data, organized according to the SPEED categories mentioned above—cultural, economic, environmental [science], legal-political, and technical<sup>2</sup>. Each utterance could be coded into as many categories as were appropriate. After SPEED codes were assigned, each coded utterance was further coded as having a positive or negative tone. For example, a reference to the need to avoid or carefully schedule “loud pile driving,” because it posed an environmental risk to marine life, was coded under environment,

<sup>1</sup>Data collection was approved by the Institutional Review Board at the University of Texas at El Paso (771749-1). Data were collected and managed in accordance with the World Medical Association’s Declaration of Helsinki and the Belmont Report, produced by the U.S. National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.

<sup>2</sup>To establish intercoder reliability (ICR) two team members independently reviewed and coded a set of transcripts. ICR was calculated with a weighted Cohen’s kappa ( $\kappa = 0.95$ ). Once this level of ICR was established, coders continued following the same protocol to insure accuracy and consistency throughout the data set.



and as having a negative tone. If the industry's awareness of this risk, and its efforts to carefully schedule (or minimize) the risky activity was part of the utterance, it also was coded as "identity culture."

Preliminary analysis conducted during the coding process made certain themes highly visible across the data, such as the preponderance of utterances with the culture node (**Appendix**). We also found plentiful resonance between offshore professionals and the frontier myth within the culture code. To further examine practices of identity composition among offshore wind professionals, we focused our next stage of analysis on the culture category, which we further subdivided into how offshore professionals identified their own culture, and how they characterized the culture of others. We labeled utterances that were self-descriptive as "identity culture," and those where participants described groups other than themselves as "characterization culture." We did not however, ignore other categories that were co-coded. Rather, we examined their resonance with the culture category. We then used an inductive approach guided by grounded theory (Strauss and Corbin, 1994) to further examine the data that was coded as "culture identity" with positive or negative tone.

We supplemented our coding with analytic memos written throughout the coding process. After discovering that our analytic memos indicated the presence of frontier imagery in the discourse, we conducted more detailed examinations. For example, we conducted text searches to find all instances where the words "frontier" and "safety" were used together. We then examined the context for these words to determine whether they were directly relevant to the industry's emerging identity.

## FINDINGS

Upon completion of SPEED coding, we found that the cultural frame dominated offshore professional discourse (**Appendix**). **Table A1** indicates that cultural and technical utterances were most frequent. Consequently, we became interested in what cultural discourses were meaningfully shaping the discourse at these conferences. Our iterative examination of cultural utterances enabled us to identify the use of the frontier myth by our participants. Textual analysis of relevant data coded as identity culture, or utterances where offshore wind professionals were describing themselves as a professional community, revealed three major themes, all of which demonstrate the use of frontier imagery. First, offshore wind professionals articulated European primacy in wind deployment, echoing European primacy to the colonial U.S. Second, offshore professionals framed themselves as heroes who have accepted the task of de-risking the frontier, as they face the dangers of erecting offshore structures. Lastly, they described an *offshore revolution* (their words) that features the ideals of independence and American exceptionalism through expansion. These themes illustrate how our participants grapple with their own frontier, including the precarious standing of the offshore wind industry in the U.S. The perceived need to develop improved technologies, demonstrate

environmental stewardship, overcome apprehension about offshore wind's economic feasibility, and address aesthetic considerations all exemplify the industry's volatility and suggest why our participants identified themselves as frontier heroes. By navigating the turbulent waters of an industry nascent within the U.S., offshore professionals seek to unlock the potential for penetration of the offshore wind resource throughout the U.S. and beyond.

## Recognizing European Primacy

Like the European settlers of yore, offshore professionals identify themselves in relation to their European forbearers. Consequently, they seek to build from Europe's successes in offshore wind technology. As voiced by one informant, "short of industrial espionage, I encourage the sector here [U.S.] to reach out to those who are experienced in Europe. . . . We'll be stealing your technology" [followed by laughter] (WP084). In addition to technological resources, U.S. offshore professionals are eager to glean insight into how to grow their industry from successes in Europe. "The European experience has offered us a large amount of experiences to draw from, numbers to evaluate and thereby forecast what our jobs and the financial requirements of this industry are" (WP027). These quotes indicate an awareness that offshore wind has yet to become mainstream in the U.S., while also suggesting an eagerness to become such. Our informants expressed their clear intent to build from the European industry:

If you look at the European model, there were a number of small projects that were implemented first, before there were really full, commercial-scale projects, and a lot of those were explicitly to be used to harness the learning curve (WP115).

Like early, short-lived colonial settlements, the offshore wind industry had to take some losses before deploying successful projects (Eckhouse and Ryan, 2017). The text from conference sessions is replete with descriptions of parallels between offshore wind development and frontier exploration and settlement, including noting the need to rely on small-scale experimental developments to secure the prosperity of more permanent, full-scale projects. One participant notes how offshore wind development in Massachusetts "allowed [offshore professionals] to remove the veils of misconception and replace that with the truth gleaned from northern Europe, the British Isles, and Block Island. And these experiences will translate into an attractive commercial market for the offshore wind industry, and over time, reduce energy costs for U.S. rate payers" (WP074). Within the U.S. offshore wind context, offshore professionals evoke the first successful English settlements in North America Jamestown VA and Plymouth MA in their arguments about sparking offshore wind in the U.S. One informant seeks to convince offshore professionals that "the same winds that brought the Pilgrims to Plymouth Rock will now power a new generation of jobs here in Massachusetts" (WP080). The way that offshore professionals see their efforts to bring offshore wind technology to the U.S. as related to the first colonial forays into the U.S. frontier provide a rich context for the second and more extensive theme in our analysis: de-risking the frontier.

## Block Island and De-risking

As the first successful offshore wind farm in the United States, Block Island serves as a metaphorical flag planted and a trailhead pointing toward the future. The importance of Block Island to our informants cannot be overstated. At one meeting, an informant proclaimed that “Block Island project is the reason we can have this conference” (WP023). From their perspective, it signifies a turning point for U.S. offshore wind; the point where their industry goes from bystander status, where they were looking enviously across the Atlantic, to the status of frontier heroes who offer this technology as a way to dramatically change the U.S. energy landscape. “The Block Island wind farm will be the first offshore wind farm in the United States, but it is just the beginning of something much, much larger” (WP023). This can be read as an allusion to frontier settlements in North America. Like these settlements, the U.S. offshore wind industry has experienced failures along the way.

Our informants described how their industry has experienced its own missteps. For example, Cape Wind, intended to be deployed in the scenic Nantucket sound, experienced delays for over 10 years (Stephens et al., 2014) leading to its eventual cancelation (Eckhouse and Ryan, 2017). Similarly, Kitty Hawk Wind Farm, while having secured its federal lease, is not expected to put “steel in the water” any time soon (Ouzts, 2017). Nonetheless, Block Island stands as a beacon of offshore wind energy deployment at the fringe between the more established onshore wind and new possibilities offshore: Our informants offered it as a momentous event that future offshore energy explorers will look back on for encouragement.

Block Island serves as the outpost, the first successful structure on the frontier. As one informant noted: “I think we’ve done much of the work to clear a path, a repeatable path, something that can be done over and over again to build out offshore wind in the United States” (WP023). Central to this clearing a path is the de-risking of offshore wind. Our informants noted that few developers are willing to accept the economic uncertainties associated with being early adopters. “Project developers are reluctant to do anything without some sort of answer.... As we all know, the [wind] industry is more or less at a standstill currently for new development. And it is due to that” (WP031). Consequently, by communicating the de-risking they are actively conducting, the offshore wind industry in the U.S. sets itself apart from the old guard of cautious, less ambitious energy industries, which includes onshore wind.

At their professional conferences offshore professionals recognize, discuss, and even embrace the additional risks such as volatile weather conditions, lack of a secure supply chain, and arrested development due to potential impacts to marine life, that come with offshore development. According to our informants, because the most salient risks faced by the offshore wind industry are human and wildlife safety, they are mobilizing to enhance both crew safety and the wellbeing of the marine ecosystem. Their expressed concern for the safety of both human laborers and marine wildlife echoes the idea of frontier heroes as stewards. While the frontier myth includes a strand that focuses on de-risking the wilderness through domination of both place and native peoples, offshore professionals propose doing so through

technological advancements and adherence to policies they have established to protect workers, marine mammals, and the overall marine ecosystem. They frame themselves as stewards who use technological innovation to ensure safety for their crews and nearby marine life.

For example, weather disturbances pose immense risk for crews engaging in the deployment of offshore wind energy infrastructure. Improved weather forecasting and refinement of turbines has increased their ability to safeguard workers.

We’re now in the position where we’re confident to be able to stop turbines... And, of course, if we can do that, we’re also reducing the risk to people..., reducing the amount of time people have to spend offshore and therefore put at safety risk (WP084).

Here they highlight technology, rather than force, as the offshore professional’s path to enhance crew safety. Offshore wind professionals do not muscle the forces of nature so much as they finesse them with technology and best practices that enable safer deployment of offshore wind energy. This is in line with Goodwyn’s (1971) notion that a distinguishing feature of some iterations of frontier heroes is the ability to harmonize with nature.

Offshore wind professionals also de-risk deployment with technologies such as floating foundations. The jacket foundation, a steel structure that relies on three or four piles drilled into the seabed (4C Offshore, 2013), has been a mainstay in the offshore oil industry, and is easily adapted for offshore wind deployment. Since they are planted at the bottom of the ocean, they take a considerable amount of time to install, which means workers are exposed to weather risks. Our informants discussed deploying floating foundations where possible to cut down on the time their crew spend offshore. “And with the weather risk you have offshore, when you’re doing floating, you can assemble the whole thing. Tow it out. And maybe spend just a couple days offshore” (WP172). They recognize that, as less established technologies, floating foundations bring increased economic risks due to smaller demand (IRENA, 2016). However, although offshore wind professionals value lowering costs through technological advancement, they insist crew safety is not negotiable, as “there really should be no price too high to pay for crew safety” (WP015).

Our informants expressed similar concerns for marine wildlife, along with seeking technological advances to alleviate potential problems. Mitigation of risks to wildlife is an important topic at their professional conferences. Certain technologies are favored because they cause less disturbance to marine life. Suction bucket foundations, for example, require no pile driving. This makes their installation less disturbing to the habitat of nearby wildlife. Monopiles also are favorably regarded for their low wildlife impact. As one participant put it: “I used to think monopiles were a disaster. But actually they’re not...and in terms of the environmental impacts; as a noise level they’re the bee’s knees” (WP182). This statement illustrates professional interest in foundation technologies that minimize disturbance of underwater habitats in a variety of ways, ranging from lower

noise levels to shortening the time period when disturbance is occurring.

In addition to identifying specific technologies that diminish risks, offshore wind professionals enthusiastically describe an ongoing search for other measures to de-risk offshore wind energy. They explain, for example, that rigorous studies are needed to make wind energy deployment safe for marine life. The knowledge attained from conducting environmental surveys then enables improved site planning.

By using this kind of baseline information on wildlife movements and habitat use, we can make more informed decisions for siting development... We can start to identify or continue to identify some approaches to avoid or minimize potential conflicts between wildlife and future offshore wind farms (WP002).

Although some of the mitigation measures are simply part of complying with legal mandates, the measures they choose to highlight also give insight to offshore wind professionals' goal of de-risking their industry and demonstrating stewardship of the seas. For example, they told us, "we're working now on plans for construction-related surveys....The right whale migration is really important to right whales. And so, we want to look out for that" (WP177). There is no doubt that offshore wind professionals may view mitigation measures as nuisances or roadblocks. However, several of our informants expressed a personal interest in developing protective measures for marine wildlife. De-risking offshore wind deployment for improved ecosystem management is indicative of their perceived environmental stewardship.

It is important to acknowledge the pragmatism of offshore wind professionals, like other frontier heroes before them. While mindful of ecosystem health, they are primarily motivated by offshore wind deployment. One informant stated, "the North Atlantic right whale mitigation measures demonstrate that flexibility can absolutely be used in our agreements to mitigate endangered marine mammals" (WP183). This statement illustrates a stewardship ethic wherein people care for the environment alongside responsible technological development. Offshore wind professionals' desire to protect wildlife, then, can be seen as part of an effort to demonstrate that offshore wind deployment need not endanger the marine ecosystem, so long as developers function as responsible stewards of this frontier.

## Offshore Revolution

A third theme that emerged is the offshore revolution. When discussing energy system change, our informants identified as being part of an offshore revolution rather than an incremental evolution (Stephens et al., 2014), and being part of that revolution filled them with "patriotic pride" (WP086). Mentions of technological revolution resonate with frontier myth imagery as scientists and engineers explore the limits of what is understood as technically feasible. As an emergent industry, participating in the offshore revolution is consistent with a pioneering identity that offshore wind professionals are composing. Our informants communicated the offshore revolution by referencing innovative technologies to reach energy

resources, enable large-scale infrastructure projects, and further national energy independence.

Professionals attending these conferences explicitly positioned themselves "at the forefront of the current energy revolution" (WP080). Like the references to Block Island being the first foray into offshore wind energy for the U.S., the notion of being "at the forefront" resonates with the frontier myth. Their claims justified by the novelty of the challenges faced by the offshore industry. Among these challenges are the varying water depths found at prospective sites for offshore wind farms, which make harnessing the wind resource especially difficult. To accommodate varying water depths offshore engineers have to innovate.

You know, putting it in where you're in 30 meters of water say, then there's a lot you can draw on in terms of the jacket design, the foundations, all that. Then if you think about the next frontier for offshore wind, it's going to floating wind turbines (WP118).

The innovation of floating foundations makes offshore wind development in the deeper waters off the U.S. west coast possible. Floating wind turbines are a relatively new technology with the first three floating wind turbines being installed in 2009 (Madslie, 2009), followed by an experimental scale model, Voltorn U.S., being deployed off the coast of Maine in 2013 (Danko, 2013). The positive predisposition toward new technology positions offshore wind professionals at the forefront of the U.S. energy revolution.

While floating wind turbines open a path to previously unattainable wind resources, the magnitude of the offshore wind resource also offers the opportunity for new large-scale infrastructure development. U.S. history is punctuated with giant infrastructure projects such as the construction of huge dams, building the interstate highway system, and Neil Armstrong's 1969 moon landing. Our informants described the offshore revolution as offering the opportunity to demonstrate that, "we actually can build big things in this country again" (WP086). This energy revolution is being ushered in at a time when the possibilities for large-scale infrastructure projects seem to have vanished. "We've been told so many times that those areas, the eras are over, you know, the big infrastructure projects, the eras of kind of great manufacturing in this country" (WP086). However, our informants proclaimed that, as the first commercial U.S. offshore wind farm to be successfully deployed, Block Island has broken the stagnation:

To see that happen was such a point of pride. And I just cannot wait until this all; and the first turbines are spinning off the coast of Block Island. And we can say, "You know what? America can do big things again." There is no bigger game when it comes to renewable energy (WP086).

A third aspect of the offshore revolution is increasing energy independence. Part of the appeal of offshore wind energy in the United States is that it promotes self-reliance. Any frontier requires a degree of self-reliance to prosper, and our informants saw themselves as promoting self-reliance for their fellow citizens. Offshore wind professionals expressed their

frontier identity by promoting energy independence through the deployment of clean offshore wind energy produced and consumed within the United States. One presenter proclaimed:

Instead of continuing to support the biggest multinational oil companies, we should be supporting the most entrepreneurial clean energy companies in the world that are sitting in this room here today. . . You are the energy revolutionaries. You are the ones who will tell OPEC once and for all that we don't need its oil any more than we need its sand (WP080).

This bold declaration illustrates the conviction that, as their industry flourishes, so does the United States. Replacing fossil fuel with wind energy is an ambitious goal that will require a revolutionary effort, which offshore wind professionals are happy to undertake.

These professionals frame the offshore revolution as extending beyond an economic or environmental activity to encompassing a service to their country. That service extends beyond immediate improvements to electric grids and invites publics to join ranks with offshore wind professionals as American heroes. "What we want to do here in Massachusetts is really start something that, frankly, Americans will be benefiting from for decades to come" (WP086). By creating a sustainable asset in the form of offshore wind infrastructure, offshore professionals are braving both the metaphorical and material winds that threaten revolutionary change. They are de-risking offshore wind energy for future generations.

We get the offshore wind industry off at scale right out of the gate here, [with] the revolution that you can ignite up and down the coast. I think it will truly be inspiring and make folks believe that we can actually come back with solutions at the scale of the climate crisis that we're facing (WP086).

Like early frontier heroes, offshore professionals see their role as trailblazers who inspire the masses to follow them into an unfamiliar energy future.

In sum, we found that U.S. offshore wind professionals are composing an identity that tracks the U.S. frontier narrative from European settlement, through de-risking, and culminating in the revolutionary creation of an independent identity. This frontier identity may contribute a heuristic framework that increases credibility for wind energy specifically and for LCET more generally.

## SELF-REFLECTION AND THE FRONTIER MYTH

Although the frontier myth is deeply sedimented into U.S. culture, and as we demonstrate here within offshore professionals' rhetoric, the specifics of its usage remain controversial. Tirman (2009) warns the myth has led to arrogant notions of American exceptionalism and destructive wastefulness. Similarly, Ceccarelli (2013a) warns that unreflective use of the myth has accentuated a science culture that glorifies individualism, competition, and traditional masculinity to the detriment of both science and broader society. We do not

intend to argue that our participants are seeking to right the wrongs of the frontier, nor that they consciously use the frontier myth when articulating their identity. Yet, the tendency of our informants to identify themselves as pioneering stewards, rather than subjugators, speaks to the possibility of redirecting this contemporary usage of frontier imagery away from the brutal celebration of empire building articulated as Manifest Destiny (Slotkin, 1985; Worster, 1994). Although we recognize this as an optimistic perspective, it is not impossible. In fact, the offshore professional rhetoric exhibited in both conference presentations and interviews is complementary with Tirman's suggestion to reinvent the frontier myth "into something more vital" such as "launching ideas for reform and renewal" (2009, p. 37). Offshore professionals articulate a frontier myth that highlights the values of stewardship, which may open inroads for offshore wind professionals to be attentive to the goals of environmental justice (Martin, 2013) to pay attention to who benefits and who is harmed by any technological change.

U.S. offshore wind professionals see themselves as responding to an energy and environmental crisis that requires them to build coalitions with publics. They have taken the first steps, de-risking the industry enough to deploy Block Island as proof of their sincerity. Furthermore, their energetically confident self-identity as willing leaders may ameliorate public suspicion toward scientists and engineers, as well as promoting trust and social acceptance (Rand and Hoen, 2017). Identification with a myth that is part of the U.S. public's collective consciousness may prove fruitful when communicating with publics.

Here, we turn to Burke's discussions of identification and alienation. He describes identification as a sense of sharing that provides a basis for consubstantiality wherein people "have common sensations, concepts, images, ideas, attitudes that make them *consubstantial* [emphasis in original]" (1969, p. 21). Scholars from both rhetorical (Burke, 1984) and communication theory (Peters, 2012) have posited alienation as the igniting exigency for communication, and essential for identification. Burke describes alienation as experiencing the world as "basically unreasonable" and thus, existing in a state of deprivation. He suggests that people attempt to ameliorate their alienation by "forming [an] alliance to a new rationale of purpose" (1984, p. 216). This new rationale of purpose, we contend, could be grounded in mutual understandings of values that resonate with the frontier myth among offshore wind professionals and end users of the resulting electricity. Harkening back to the images of frontier heroes and positive attitudes about progress and independence that are widely shared, if not well understood, in the United States, may offer new opportunities for identification and consubstantiality. This alignment could begin to alleviate alienation of publics from the political decisions over energy deployment, an area of politics is not always "owned" by polis. Alleviating alienation from this, or any other political process, is not synonymous with producing agreement. Rather, it may simply contribute to more lively disagreement. Furthermore, following Peters (2012), if the key communicative question with which humans grapple is how far to go beyond the individual self, then fostering consubstantiality via identification with end users of the electricity produced by offshore wind farms falls well within the realm of reason.



## Strategic Coalitions

Despite our hopeful outlook, we recognize that any serious effort to build coalitions from a shared identification with the frontier myth requires both recognition and repudiation of the central role played by frontier imagery in the intentional decimation of Native American populations (Slotkin, 1985; Nash, 2001), the wanton destruction of centuries-old forests (Worster, 1994), and other efforts to subjugate Earth and its inhabitants (Slotkin, 1985; Worster, 1994; Tirman, 2009; Slatta, 2010). Further inquiry into indigenous perspectives toward offshore wind energy and other LCETs may contribute to de-colonializing the energy system and directing energy system change toward less oppressive relationships, and even toward building opportunities for energy justice and energy democracy that explicitly protect the sovereignty of people who have been historically marginalized (see, for example, Clarke, 2010; Imasato, 2010; de Onís, 2018; Na'puti, 2019).

Under these conditions, a revised frontier could attract diverse stakeholders to promote the development of strategic coalitions that increase both efficiency and inclusion (Endres et al., 2009). While such coalitions are likely to be temporary and goal oriented, they may also be effective. The articulation of the frontier myth among offshore wind professionals provides a variety of possibilities for building coalitions with publics. Some will identify with the entrepreneurial adventure of tapping into a new market and energy resource. Conservation groups can relate to concern for marine ecosystems. Still others may support deployment of offshore wind energy to increase energy independence. And others may investigate the benefits and harms of offshore wind energy for historically marginalized communities and for more-than-human beings. Offshore wind energy professionals' enthusiasm for an energy revolution may be contagious and conducive to further conversation about, and alignment with, the goal of increasing identification across a broad group of actors with distinct political ideologies. This may unite disparate groups that support offshore wind energy and other LCETs, if only because they contribute to domestic energy security and independence.

This analysis has focused on discovering and exploring ways that a particular group of LCET professionals employ frontier mythology in composing their identity. Recognizing this commonality between energy professionals and non-technically oriented energy users need not go any further. As noted by Ceccarelli (2013b), RoS scholars have tended to prefer a passive role in the study of science. On the other hand, along with other scholars (Sprain et al., 2010; Cozen et al., 2018), we follow Cox's (2007) claim that environmental communication research demands that we risk neutrality by suggesting potential applications to, in this case, energy transitions. Learning that offshore wind professionals attending professional conferences saw themselves as frontier heroes in the stewardship model led us to imagine opportunities for building a sense of community with people who are alienated from science and technology. The nascent identity of our informants suggests their consubstantiality with publics who share an enthusiasm with notions such as independence and self-reliance, and who even seek out risky activities for recreation. Despite its limitations, this

study contributes to a conversation that recognizes and respects difference while being grounded in the shared culture of the U.S. frontier myth.

## CONCLUSION

This study explored how U.S. offshore wind professionals compose an identity grounded in the narrative of the frontier. The emergent status of this industry provides fertile ground for scholars to explore the rhetorical composition of professional identity. And, in this case, understanding how offshore wind professionals have employed frontier imagery offers opportunities for building a sense of community with publics and policy makers, thus, contributing to Sismondo's (2008) call for research within an engaged paradigm of STS. The analysis also offers one pathway for rhetorical scholars who wish to extend their impact beyond theoretical insight into the realm of policy (Ceccarelli, 2013b).

As such, frontier mythology is a heuristic that U.S. offshore professionals might consciously use to increase identification with and trust in their industry. By identifying themselves as stewardship-oriented frontier heroes, U.S. offshore wind professionals offer publics an opportunity to experience a sense of consubstantiality with scientists and engineers who, like them, seek to build a stronger community. The optimistic imagery their discourse evokes could transcend political boundaries; enabling publics to participate in conversations around energy policy that begin not from a position of alienation or apathy, but as partners in a joint venture.

## DATA AVAILABILITY STATEMENT

A partial and anonymized version of the datasets generated for this study are available on request to the corresponding author.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by University of Texas at El Paso Institutional Review Board for Human Subjects. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

All authors have made a substantial intellectual contribution to the work, and approved it for publication. NH developed the research topic, conducted analysis, wrote the first draft, and participated in all revisions. CH collected data and coordinated its management, processing, and analysis. DE and TP developed the analytical framework and obtained funding for the research.

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## APPENDIX

**Table A1** | Number of utterances per SPEED category.

Category	Definition	Utterances
Cultural	Normalized cultural practices and actions (a set of practices and actions within the culture) that are used to represent what it means to reside in a particular community	9877
Technical	Refer to technological advances and represent traditional ideas of progress that facilitate human control of the natural world. They are articulated largely through discussions of the technical feasibility of deploying a particular technology	4558
Political-Legal	Refer to the regulatory structures that have developed in a given society, and represent cultural norms that have become codified. Includes political structures currently in place, and represent the ability to directly influence policy decisions	1999
Environmental	Represent the bio-physical system human society inhabits, with relations between humans and the larger ecosystem at their center (e.g., climate change)	1373
Economic	Monetary profit and loss, and represent the ability to pay for relevant products. They are articulated largely through financial and market reports at both public and private levels	2005