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Evaluating a collaborative governance regime in renewable energy: Wind power and the Lake Erie Energy Development Corporation (LEEDCo)☆

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ABSTRACT

The Lake Erie Energy Development Corporation (LEEDCo) illustrates the leverage that the collaborative governance regime (CGR) brings to start-up renewable energy ventures. Called Icebreaker, the effort to build the first freshwater offshore wind farm in North America demonstrates that a CGR spearheaded by committed project advocates is critical to pave the way for renewable energy projects. With construction scheduled for 2021, this case study hypothesizes that collaborative leadership is a noteworthy trailblazing method for renewable energy projects. To assess this claim, this case study applies four propositions of the collaborative leadership model (i.e., activating, framing, mobilizing, and synthesizing) and hypothesizes that a committed project steward's capacity for synchronizing the project with existing regulatory constraints is the fifth key element of a successful CGR in the renewable energy context. Perhaps the lessons emerging from this case study will help to guide green entrepreneurs attempting to launch sustainable energy initiatives.

1. Introduction[1]

This article responds to the call in the literature for 'a more precise recipe for successful collaborative efforts' in the United States

☆ Baldwin Wallace prepares students to become contributing, compassionate citizens of an increasingly global society encouraging the pursuit of personal and professional excellence.

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particularly in the renewable energy context (Benton, 2013, 223; Schmaus, 2017, 1). The specific focus of this research is on the Lake Erie Energy Development Corporation (LEEDCo) seeking to situate a demonstration wind farm called 'Icebreaker' on Lake Erie off the coast of Northeast Ohio thereby opening the Great Lakes to the wind industry. Icebreaker has great national significance as there are no other wind turbines situated on the Great Lakes despite the wind energy potential of Lake Erie alone to supply a projected 10% of the annual U.S. energy portfolio or 742 GW, which is 20% of the total wind energy potential in the country (LEEDCo, 2019; Hudson 2012).[2] Icebreaker also holds regional significance. Northeast Ohio is uniquely prepared in the United States to support this industry from the ground up given its extant infrastructure and trained human capital (i.e., heavy manufacturing, engineering, and maritime industrial footprint) (LEEDCo, 2019). Concretely, Icebreaker holds the potential to create 8,000 jobs in Northeast Ohio alone generating nearly $14 billion in revenue (LEEDCo, 2019).

Revenue aside, the environmental advantages to offshore wind energy are immense. Cleveland ranked 10th worst in air quality of 187 metropolitan areas surveyed by the American Lung Association (2018). Since wind does not emit any of the greenhouse gases associated with other power sources, this is a sharp advantage. Also in contrast to coal fired power plants which still account for the majority of Ohio's energy portfolio, wind farms do not emit mercury which is significant for communities situated near the largest freshwater system in the world. In a similar vein, '[w]ind power needs no cooling water [and] so does not release heated water into lakes and rivers,' which is beneficial to aquatic life (LEEDCo, 2019).

It is finally worth noting the advantages of offshore projects as opposed to onshore wind farms. Offshore wind farms perform more consistently as the turbines are able to capture higher wind speeds thus better matching baseload power demands (LEEDCo, 2019). Likewise, ' … offshore wind avoids many of the conflicts posed by land-based wind projects including: visual impacts, noise, and shadow flicker' (LEEDCo, 2019).[3] This is helpful to circumvent community concerns about wind farms that are often articulated in well populated areas.

Despite all of the advantages enumerated above, the U.S. model of privatized energy poses significant barriers for newcomers to break into the market (see 'Wind Energy in the United States and Ohio' section below). Even so, research has suggested that alternative models such as the Public-Private Partnerships (P3) should be studied with greater care to ascertain what it will take to ensure that renewable energy projects are successful (Schmaus, 2017). Indeed, many international case studies examine the effectiveness of adopting a P3 in renewable energy ventures such as in Portugal (Martins et al., 2011), Greece and Italy (Manos et al., 2013), and Spain (Arbulú et al., 2017). Nonetheless, studies suggest that a rigid contractually based P3, "where businesses supplement public investment in return for reaping rewards such as tolls and fees" is less likely to be successful despite their rising popularity in the Trump administration (Worland, 2018; Maltin, 2019).

As such, this case study considers the advantages presented by the more flexible collaborative governance regime (CGR) particularly in the U.S. renewable energy sector (Vangen and Huxham, 2003; Emerson and Nabatchi, 2015). Unlike a P3, a CGR has been defined as a type of public governance system in which cross-boundary collaboration represents the predominant mode for conduct, decision making, and activity between autonomous participants who have come together to achieve some collaborative purpose defined by one or more target goals (Emerson and Nabatchi, 2015, 18).

This is also a "self-initiated" type of CGR "formed through the voluntary association of stakeholders who engage directly with one another based on self-interests and shared interests" (Emerson and Nabatchi, 2015, 170). This case study grounded in participant-observer research provides strong support for a number of axioms in previous projects such as the significance of a 'savvy' project steward with both managerial and political competence to shepherd the project by activating key players and resources, facilitating agreement on roles of various stakeholders, mobilizing commitment, and 'promot[ing] purposeful interaction among the projects participants' (Schachter et al., 2017, 646–647). Adopting a case study methodology and pursuing this particular study is defensible as this is both a revelatory case study in that the researcher secured 'access to a situation previously inaccessible to empirical study' as a participant-observer and a longitudinal one as the same case is assessed over 8 years at multiple points in time (Yin, 2017, 52–53). These two aspects make this case study particularly powerful as access to the research participants required a significant amount of trust building over a long period of time and the developments examined below unfolded in the energy sector quite slowly. As such, the primary value of this research is in providing strong support for a theory that has seldom been considered in this revelatory and longitudinal fashion. The details of this approach are explained further below in the methods section of the paper.

Regardless of the rationale for selecting a case study methodology, 'the processes being studied should nevertheless reflect the theoretical propositions posed by the case study' (Yin, 2017, 53). In this instance, collaborative leading involves four core theoretical propositions which one might note are elements of 'initiating leadership' that serve to 'drive' collaborative governance regimes towards dynamic collaboration (Emerson and Nabatchi, 2015, 26–27). Those initiating CGR leadership elements include fluency on the part of the leader in assembling a team (i.e., *activating*), helping the players to agree to their roles (i.e., *framing*), the capacity to inspire commitment in the stakeholders (i.e., *mobilizing*), and promotion of collaborative arrangements between stakeholders (i.e., *synthesizing*) (Schachter et al., 2017, 647). All of these variables are part and parcel of the 'system context' of the CGR under review (Emerson and Nabatchi, 2015, 41–43).

Equally so, the practical purchase of this study is confirmed with regard to the governance implications as renewable energy often involves a project's equity impact on the surrounding community (Schachter et al., 2017, 645). This is generally true of sustainability

[2] Lower estimates of wind power potential in the Great Lakes such as 136 GW of technical resource capacity were due to the concern over ice formation (Beiter et al., 2017, 47), which the Icebreaker project has circumvented through technological innovations.

[3] This phenomenon is caused by periodic shadows cast over adjacent properties as a result of the spinning turbine blades (Crocker Wind Farm, 2017, 2).

related projects which often need to be tailored to the unique needs of the implicated community (Koppenjan and Enserink, 2009). When renewable energy projects fail to take those needs into account, spectacular failure is likely as was observed in Nantucket Sound with the dissolution of the Cape Wind project, intended as the first offshore wind farm in the United States (Eckhouse and Ryan, 2017).[4] The Cape Wind case study explored in depth by Layzer (2016, 308–338), is a powerful counterfactual to LEEDCo's Icebreaker project as it demonstrates how stakeholders opposed to the purely private project used legal 'veto points' to stall forward progress repeatedly over a decade until the entrepreneur, Jim Gordon, finally abandoned the endeavor. Another helpful counterfactual is that of the failed New Jersey offshore wind project terminated upon the withdrawal of support by then governor and U.S. presidential candidate Chris Christie. In short, largely due to the absence of a strong CGR, Christie was able to reverse course on his support for wind energy in the state upon his entrance into the presidential race. This political setback ultimately spelled the end for the offshore wind project (Rahib, 2017). These counterfactuals lend helpful support to this research suggesting it is critical that the project steward lays the groundwork establishing a regulatory environment friendly for renewable energy. As such, a fifth element is hypothesized here: namely, the capacity of the project steward to bring the project in line with the regulatory environment and to shape that environment if necessary (i.e., '*synchronizing*'). The following begins by addressing the research methods before briefly introducing the background of the wind industry in Northeast Ohio. Thereafter, this research underscores the broader implications of this case study to further clarify the recipe for successful collaborative governance regimes (CGRs) in the United States along with suggesting avenues for future research.

2. Methodology

The early stages of this research began with a generous 2011 research grant from the McGregor Foundation. The grant afforded university researchers from multiple departments funding to engage in IRB approved fieldwork into each of the major sustainability initiatives in the Greater Cleveland Area. Each grant recipient was also assigned a funded summer research assistant. Grant recipients agreed to update these case studies over the course of the next two years. The author of this paper chose the local initiative of the Lake Erie Energy Development Corporation (LEEDCo) to research with the ultimate goal of assessing the success and impact of this collaborative governance regime's (CGR) initiative to situate wind turbines on the Great Lakes. The researcher had only passing knowledge of this wind demonstration project. Thus, this case study was chosen solely due to significant local media coverage suggesting a vibrant collaborative governance regime (CGR) which had activated multiple community stakeholders from the public and private sectors along with the connection to renewable energy. Likewise, given the ongoing significance of renewable energy projects in the national discourse, this topic seemed to hold significant policy import for Northeast Ohio and beyond.

As such, gathering the requisite data required significant fieldwork including penetrating the policy network. Recognizing the significant time investiture required, the researcher hired a second student research assistant to provide additional help with the interview and data collection process. As such, this project began as a case study based in semi-structured interviews and further supported by document collection provided by the research participants. A snowball interview sample method was employed to determine the network of individuals involved in this CGR along with the less clearly identified epistemic community of peripheral stakeholders. Although the background of the organization and network will be described in greater depth in later sections of this study, three examples drawn from the first interviewees contacted will suffice to demonstrate this snowball sampling process.

First, the author learned that one of the leading environmental attorneys in Northeast Ohio, Mr. Dave Nash, had been a significant advocate for launching the wind turbine demonstration project and had volunteered to serve on the external advisory committee for the Sustainability Program at the researcher's institution in the past. Thus, this attorney was a reasonable place to start to learn more about the founding community team behind the project given his previous rapport with the researcher's institution. Moreover, given the significant regulatory hurdles that stood in the way of an offshore wind project in the world's largest reserves of freshwater, speaking with an individual steeped in the legal challenge of achieving the project was desirable. Second, a review of LEEDCo's online website clarified that LEEDCo was overseen on a daily basis by its CEO, Dr. Lorry Wagner who is a trained nuclear engineer, along with paid staff members. Two of those staffers were alumni of the researcher's institution and fortuitously former students of the researcher. Thus, approaching the staff members for interviews of the entire LEEDCo staff was also straightforward and became a key source of primary data. Likewise, the LEEDCo staff was willing to maintain ongoing communications for quite some time including supplying access to technical documents and answering numerous follow up inquiries along with fact checking.

Third, LEEDCo's website highlighted that the community interfaced with the organization through public education events and through a Cuyahoga County City Planning Commission volunteer body titled the Great Lakes Energy Development Task Force (hereinafter 'Task Force'). The chair of the Task Force at the time was Assistant District Attorney, Steve Dever. As such, the researcher contacted Dever via E-mail to gain a sense both of how the organization operated internally and how it was interfacing with various regulatory bodies through this Task Force. Dever subsequently invited the researcher to participate directly on the Task Force by joining the meetings in downtown Cleveland and witnessing the perspectives of the stakeholders on the wind demonstration project firsthand.

Given this opportunity for immediate and unparalleled participant-observer insider access, the researcher agreed to the opportunity and began regularly attending these meetings. Typically, the meetings were visited by energy company representatives, natural gas and solar industry representatives, labor union representatives, wind industry entrepreneurs, wind financiers, representatives of

[4] For a more detailed discussion of the background of this case, see Layzer, Judith A. (2016). "Chapter 13: Cape Wind: If Not Here, Where? If Not Now, When?" in *The Environmental Case: Translating Values into Policy, 4*th *Edition*. Washington, D.C.: Congressional Quarterly Press, pp.421–462.

the Cleveland mayor's Office of Sustainability, council members of surrounding counties, representatives of local manufacturing firms, and an assortment of other community leaders including members of the public on occasion.[5]

Dever also asked whether the researcher's institution might be interested in hosting the Task Force. As this was an excellent opportunity for students to observe collaborative leadership in progress, the researcher organized and hosted the Task Force twice at Baldwin Wallace University first on November 8th, 2012 and then again on April 8th, 2013. The events were exceedingly well attended with over 50 guests present on each occasion from a multiplicity of backgrounds related to the wind project along with many students. While Wagner was the keynote speaker representing LEEDCo, competing industry representatives from the solar and natural gas sectors were also invited to speak as well given that the Task Force saw its mission as broadly supporting energy development in Northeast Ohio and not just wind or renewable energy. Natural gas was thus given significant attention as a topic with multiple officials weighing in such as Jennifer Fenderbosch, Councilwoman for the City of Avon Lake, speaking about her community's decision to retrofit all law enforcement vehicles with natural gas canisters and the efforts to build natural gas refilling stations at strategic locations such as by the Cleveland airport. Thus, the meetings were a transparent way for interested alternative energy parties to share knowledge, network, and build consensus around future projects in the region.

The researcher's data gathering and participation in this policy network continued into the summer of 2014. For instance, LEEDCo decided to survey thousands of local residents to ascertain whether they might be willing to pay higher energy bills for renewable energy from offshore wind turbines. LEEDCo employees, including student interns of the researcher's institution, went door-to-door asking residents to sign 'Power Purchase Pledges' indicating their support for Icebreaker. One LEEDCo team member hired for the summer was the researcher's advisee. The relationship between Baldwin Wallace University, LEEDCo, and the Task Force became sufficiently noteworthy that the local business magazine, *Cleveland Business Connects*, ran an article describing this cooperative relationship (Tramer and August, 2014).

As the initial McGregor Foundation grant required updating the research on the various sustainability related initiatives in the Greater Cleveland Area, a course titled "Sustainable Cleveland" was subsequently held at the university in the fall of 2015 for upperclassmen in the Sustainability Program. As such, the researcher returned to this topic once again with a new research assistant conducting additional interviews and updating the information collected based upon ongoing developments. Likewise, Wagner returned to the researcher's university to speak about the challenges and opportunities facing LEEDCo at that time. As funding for the wind demonstration project was in doubt along with a less favorable policy environment in Ohio for renewable energy (described below), it was unclear whether the project would move forward.

At this point, with the McGregor Foundation's original project expiring at the end of 2015, the researcher continued following this case study. Beyond the practical question of whether the project would ultimately move forward given the hefty financial price tag of over $120 million for the demonstration project, the researcher was seeking evidence that this collaborative governance regime would be able to successfully create the regulatory framework allowing for wind turbines to be built offshore. As the stated purpose of this project is to help launch the renewable wind industry in Ohio industry through a wind demonstration project, building an amenable regulatory environment, in addition to constructing the actual project, are the chosen measures of success. This definition accords with the literature given that "'[s]uccess'… is multidimensional, in that its definition changes as the project progresses' (Schmaus, 2017, 15). For purposes of this project, therefore, Stephen Page's definition of 'success' is adopted which is defined as the 'outputs and outcomes of the… projects that the collaborators launch' (Page 251). In this case, the two salient outputs as measures of success are (1) the regulatory environment and (2) the actual construction of the project.

Related questions considered in this project although not directly tied to these primary research questions were whether the momentum for this project and thus the glue for this CGR would be maintained in the subsequent years. Significantly, the Task Force largely went inactive in 2015–2016 as it became uncertain whether funding for the LEEDCo project would be secured. The Task Force tried to refocus its efforts on natural gas and the researcher was invited to join a committee on that topic. The researcher declined and ceased participating as this did not align with the original intent of the research project to evaluate a public-private partnership in renewable energy. Other participants did as well. Since then, however, multiple new events have transpired including the receipt of LEEDCo of significant funding for the Icebreaker demonstration project from the U.S. Department of Energy. Likewise, the researcher has maintained contact with the organization and stayed apprised of continuing developments.

As this discussion clarifies, the research underlying this paper has been gathered through a variety of means over the past 8 years with multiple research assistants, dozens of formal research participants, and many more informal interviews conducted through extensive participant-observer involvement. The following turns to more specifically addressing the background of the wind industry both in Ohio and the United States more generally along with the policy atmosphere towards wind energy. This discussion is important to set the stage for considering the larger industry context and thus the challenges facing Icebreaker.

[5] A sampling of regular attendees include (1) Paul Alsenas, Director of the Cuyahoga County Planning Commission, (2) Michael Challender, Sustainability Coordinator, The Lorain County Growth Partnership, (3) Neil Dick, Program Project Organizational Development Specialist (4) Jennifer Fenderbosch, Councilwoman for the City of Avon Lake, (5) Chuck Keiper, Executive Director at the Northeast Ohio Public Energy Council (NOPEC), (6) Bill Mason, Attorney at Bricker & Eckler LLP, (6) Jenita McGowan, Former Chief of Sustainability for the City of Cleveland, (7) Brian Davis, Mizar Technologies LLC, (8) Anand Natarajan, Energy Manager, Cleveland Mayor's Office of Sustainability, (9) Scott Sanders, Executive Director at the Earth Day Coalition, (10) Sarah Taylor, Independent Renewables and Environment Professional, (11) Larry Viterna, President of Nautica Windpower LLC.

3. Wind energy in the United States and Ohio

While Ohio is considered to be a national leader in wind-related manufacturing and has more manufacturing facilities that are wind-related than any other state (American Wind Energy Association, 2016), the future of wind energy in the U.S. and Ohio remains turbulent. Although wind turbine technology dates back to 1887 when Charles Brush built the first automated wind turbine for power generation in Cleveland (Eisenman and Charles, 1967), the wind industry in the United States has a long way to go and in Ohio is only just starting to make headway.

This is traceable to missed business opportunities at home dating back to the 1970s. The 1970s seemed to be a critical juncture for embracing renewable power with the Oil Shocks of 1973 and 1979 sending a stark message to the U.S. consumer of the danger of over dependence on foreign oil. Moreover, the technological possibilities for change seemed within reach as the National Aeronautics and Space Administration (NASA) at the Glenn Research Center in Cleveland, built a 100-kw turbine at the Plum Brook Station in Sandusky, Ohio in 1974 (Wittry, 2006). Yet, even though it achieved international acclaim, the program never caught on and was subsequently abandoned in 1981. Likewise, although the Oil Shocks gave a boost to energy conservation efforts, the subsequent decline in fuel prices in the 1980s resulted in a 70 percent cut by the Reagan administration in federal funding for conservation along with a drastic cut by almost two-thirds for research and development of alternative energy sources (Prestowitz, 2003). Today, the largest hurdle to U.S. entry into the market appears to be an international one as the U.S. arguably struggles to catch up to the rest of the world in wind technology and production. Particularly in the context of offshore wind power generation, the technological knowhow for building the necessary cables for transporting power along with patent rights for turbine designs are often found in foreign hands (Wagner, 2012).

As a result, some of the world's most impressive offshore facilities are found overseas. For instance, Japan originally proposed to expand a single wind farm off the coast of Fukushima, the site of the 2011 nuclear disaster (Burkart, 2011; Watanabe, 2012). Named the Fukushima Forward wind project, today it '… is set to become the world's biggest floating offshore wind farm with a total capacity of 16 MW' (Power Technology, 2014). South Korea also has produced and continues to produce wind farms. The country developed its first commercial-scale wind farm, the Tamra offshore wind farm, which is located in the coastal waters of Jeju Island. It is comprised of ten 3 MW turbines that have been manufactured by Doosan Heavy Industries and Construction. Despite a number of setbacks, the wind farm became operational in October of 2016 generating its first power (Verbruggen, 2016). Likewise, an additional 96.8 MW wind farm is planned for the Yellow Sea (Xin, 2019).

Offshore wind energy in China has exploded with '[n]ew offshore wind installations account[ing] for 360.5 MW in 2015 (100 turbines), up 57.2% from 2014' (Global Wind Report Annual Market Update, 2015, 2016). Over 50% of the installations were intertidal projects, while the rest were near shore projects. In addition, as of 2016, China already has massively installed 168,690 MW of wind power (Global Wind Energy Council, 2017). This represents a substantially larger amount than the United States which totals 82,184 MW (Global Wind Energy Council, 2017).

Aside from China, the European Union has heavily invested in wind energy development. Specifically, 12.5 GW, of which 10,923 MW were installed onshore while 1,567 MW were situated offshore, of new wind power capacity that was installed in the European Union during 2016. In fact, wind power is now the most installed form of power generation in Europe (European Wind Energy Association, 2017). Thus, from an international standpoint, wind power generation is just another accepted part of the energy portfolio. As a result, wind companies seeking to build turbines in the U.S. must survive in a competitive international marketplace where China and Denmark stand as the first and second largest producers of wind turbines in the world, respectively (Cusick, 2016). Likewise, countries like China and Vietnam have proven to be daring competitors with a history of dumping under-priced wind turbines on the U.S. market (Shen, 2012).

Setting aside international innovation and the failure to capitalize on early scientific discoveries, two additional hurdles to the wind power industry in the U.S. stem both from its newcomer status to the energy industry as well as the current policy atmosphere. As to the former point, wind power faces substantial start-up costs as it seeks to carve a niche in an admittedly saturated market that is heavily regulated. The U.S. is experiencing a nationwide boom in natural gas through the controversial method of hydraulic fracturing ('fracking') (Watson, 2012; Gartland, 2011). This nonrenewable if plentiful resource is proving to be a significant competitor to renewable energy as it provides consumers with a cheap and often lucrative alternative ranging from 3 to 12 cents per kilowatt hour depending on market prices (Sever, 2008). In fact, natural gas production stemming largely from shale is projected by the U.S. Energy Information Administration's Annual Energy Outlook 2012 to increase 'from 21.6 trillion cubic feet in 2010 to 27.9 trillion cubic feet in 2035, a 29% increase' (U.S. Energy Information Administration, 2012(a)). According to the Energy Information Administration, as of 2016, U.S. fracking now accounts for more than half of all U.S. oil output. This is rather shocking considering in the year 2000 fracking only made up 2 percent of American oil production. In addition, there were just 23,000 fracking wells that would pump roughly 102,000 barrels of oil a day. Now, there are 300,000 fracking wells that pump out 4.3 million barrels per day (Egan, 2016). Yet, many claim that contaminated underground water, chemical laden wastewater, and methane contamination are the unacceptable byproducts of the fracking process (e.g., see McGlynn for a balanced discussion 2011, 1054–1056). As a result, the U.S. Environmental Protection Agency (EPA) (2013) is taking an ongoing look at fracking to ensure that 'natural gas extraction does not come at the expense of the public health and environment.'

As to the latter point, the policy atmosphere towards wind energy has also been tempestuous with the White House prioritizing decreased dependence on foreign oil since the Obama administration (Krauss and Lipton, 2012). In fact, this policy has been remarkably successful with the U.S. now averaging net imports of petroleum of approximately 4.9 million barrels per day (MMb/d),

which equates to 25% of total petroleum consumption in 2016 (U.S. Energy Information Administration) as opposed to 60% in 2005 (Krauss and Lipton, 2012). As a result, this 'all of the above' strategy, endorsed by Republicans and Democrats alike, means that wind energy requires federal subsidies to remain competitive. Yet, despite concern that Congress would not renew the Wind Energy Tax Credit originally scheduled to expire in 2012, the 11th hour fiscal cliff agreement included a one year extension estimated at $12.1 billion for wind energy subsidies, which provided 2.2 cents in tax breaks for every kilowatt hour of electricity produced by wind turbines and other renewable sources (Trabish, 2013). This was perhaps due in part to the vocal support of continuing the tax credit scheme by current and past energy officials from Ohio, Pennsylvania, Iowa, and Colorado who indicated that tens of thousands of jobs are at stake (Spinelli, 2012). In fact, the American Wind Energy Association (2013) estimates that up to 37,000 of the 75,000 jobs in the U.S. wind energy industry might have been lost without the Wind Energy Tax Credit.

As of 2013 the Production Tax Credit (PTC), also known as the wind energy production tax credit, expired. However, on December 17, 2014, Congress extended the PTC for projects that would be built by the end of 2014 (Union of Concerned Scientists). Specifically, '[t]he Tax Increase Prevention Act of 2014 (H.R. 5771, Sec. 155) extended both the PTC and permission for PTC-eligible facilities to claim the Investment Tax Credit in lieu of the PTC through the end of 2014' (DSIRE). This legislation then expired on December 31, 2014. The Consolidated Appropriations Act of 2016 (H.R. 2029, Sec. 301) was then enacted in December 2015 and was effective January 1, 2015. It also extended the PTC and ' … the permission for PTC-eligible facilities to claim the Investment Tax Credit in lieu of the PTC through the end of 2019 for wind facilities' (DSIRE). The Consolidated Appropriations Act includes a phase-down in the PTC amount dedicated to wind facilities that scheduled to be constructed in 2017, 2018 and 2019. In 2017, the PTC amount was reduced by 20%. By 2018, the PTC amount was reduced by 40%. Finally, in 2019, the PTC amount is scheduled to be reduced by 60% (DSIRE).

For the short-term, therefore, the policy outlook for wind energy is positive which was due in great measure to the Obama administration. Certainly, the outcome might have been very different had Governor Mitt Romney been elected as opposition to wind power subsidies were part of his campaign platform. In Romney's words, the Tax Credit is 'money wasted on projects that do not bring us dividends' as '[t]he failure of windmills and solar plants to become economically viable or make a significant contribution to our energy supply is a prime example' of 'a politically favored approach' (Goad, 2012). Romney's position was not unique as some, including academics, continue to cast doubt on the promise of renewable energy (see Morriss et al., 2011). In opposing the tax credit extension, Senator Lamar Alexander (R-Tenn.) (Collins, 2017) continues to argue that limited funds should be applied to other more promising renewables. This perspective resonates with the Trump administration, which sought to cut the budget of the Department of Energy for energy efficiency and renewable energy funding by 72% in January of 2018 (Carter, 2018).

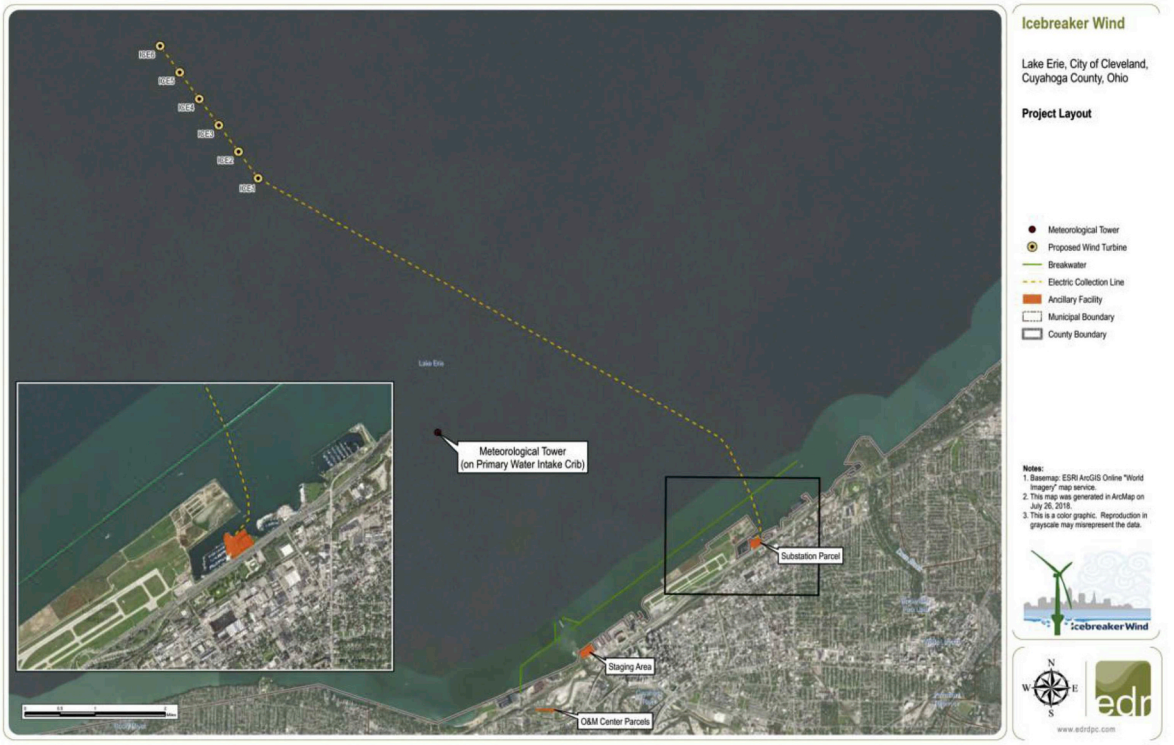
4. Case study

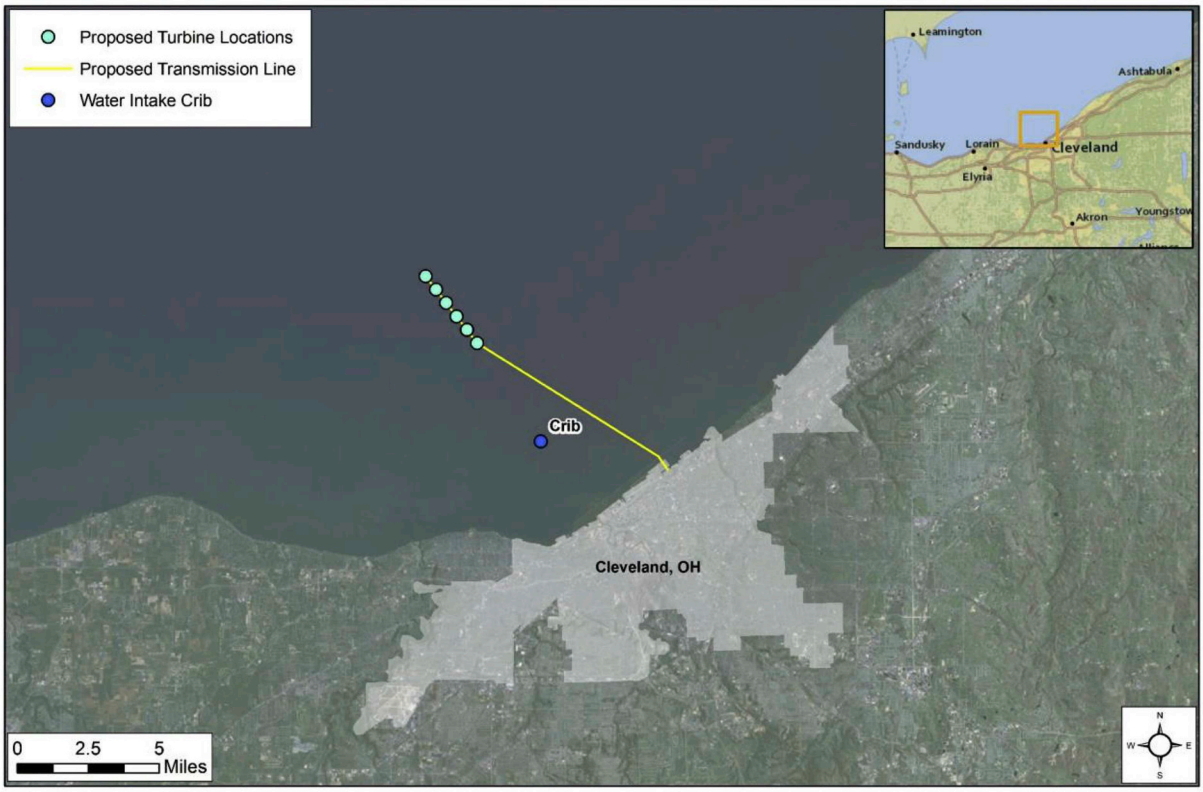
This case study is the story of the Lake Erie Development Corporation (LEEDCo). Tasked with navigating the crosswinds of federal and state regulatory jet streams to build the first freshwater wind farm in America, LEEDCo is the non-profit brainchild of nonprofit, public, and private interests in Ohio. Lake Erie has long been viewed by alternative energy enthusiasts as a golden opportunity. Since 2009, LEEDCo has advocated to make that possibility a reality by building wind turbines seven miles off the coast of Cleveland.

Called 'Icebreaker' after both the technical challenges to managing ice in the winter and 'breaking the ice' for this first U.S. freshwater wind turbine project, LEEDCo inked an agreement with MHI Vestas, a company that was created by Mitsubishi Heavy Industries of Japan and Vestas Wind systems of Denmark, to commission six wind turbines that will each have a generating capacity of 3.45 MW (Funk, 2016b, see Fig. 1: Icebreaker Project Location). Likewise, LEEDCo then partnered with Fred. Olsen Renewables (FOR) in 2015, a Norwegian investment firm, to assist in shouldering the significant costs of constructing and operating Icebreaker (LEEDCo, 2019). The plan is eventually to expand to a larger project with perhaps as many as several hundred turbines (Wagner, 2015).

In many ways, the story of LEEDCo's genesis and ongoing mission are a remarkable microcosm of both the triumphs and travails of wind energy. From an economic vantage point, despite the potential benefits to the regional economy, Icebreaker has often met reluctance as some have questioned the short-term economic viability, environmental impact, and practicality of wind energy (Rucker, 2012). More colloquially, some ask whether it will be 'a mistake on the Lake.' Given its long-term goal of paving the way for wind energy development in Ohio, LEEDCo has remained responsive to these concerns. For instance, LEEDCo switched from General Electric's turbines in July of 2012 to Siemens after concluding that the latter's design was more likely to generate sufficient power and profits offshore to justify the project (Karpinski, 2012). As of 2016, LEEDCo decided to use wind turbines from MHI Vestas for the project (Funk, 2016b). Likewise, LEEDCo has been careful to build its business models without the expectation of federal tax credit dollars seeking alternative and more predictable sources of funding (Wagner, 2012). At the same time, LEEDCo faces other significant economic challenges as Ohio has also seen declining energy costs in recent years, particularly in the natural gas market due to the exploitation of Marcellus and Utica Shale in the region (Gartland, 2011). This competition exerts pressure on LEEDCo to achieve the lowest feasible cost per watt to the consumer thereby ensuring that the energy ultimately generated offshore is an attractive source of power for Ohio utilities and possibly directly to citizens through power purchase agreements.

From a political standpoint, LEEDCo saw support fade when the Ohio state government administrations changed in 2010. Former Governor Ted Strictland backed alternative energy projects as well as promoted incentives such as the Advanced Energy Portfolio Standard (AEPS) to offset some of the high upfront costs. However, under Governor John Kasich, the administration was initially reluctant to support wind energy subsidies (Rucker, 2012). Likewise, the very rules that the wind industry has been operating under are now threatened with significant change in the form of 'cogenerated' power.





Source: Maps courtesy of LEEDCo and reproduced with permission.

Fig. 1. Icebreaker project location.
Source: Maps courtesy of LEEDCo and reproduced with permission.

By way of background, Ohio passed the Renewable Energy Portfolio Standard (RPS)[6] in 2008 which requires that 25% of the power drawn by Ohio utilities derives from alternative energy sources by 2025 (Haugen, 2012). While perhaps even stronger than the standards adopted by other states, the legislation is not without weaknesses. First, of the 25% 'alternative energy' sources, only 12.5% is actually classified as 'renewable' whereas the remainder need only come from 'advanced energy sources' which includes nuclear power, combined heat-and-power, along with 'clean coal' (Database of State Incentives for Renewables and Efficiency, 2012). Second, the 12.5% renewable incentive is not much of a boost to Ohio renewable energy projects as only 6.5% of the power is stipulated for in-state generation. However, there is a penalty called an 'alternative compliance payment' imposed by the law for failing to meet the annual benchmarks imposed by the RPS, which is presently $45/megawatt-hour (MWh), but is adjusted annually by the Public Utilities Commission of Ohio (PUCO) in reference to the changes of the federal Consumer Price Index.[7]

Returning to 'cogenerated power,' Ohio Senate Bill 315, passed in June of 2012 (Section 4928.01[36a.i-vii]) presents a significant challenge to the future viability of wind energy in Ohio. Specifically, the law seeks to undermine the RPS further by redefining 'renewable' energy to permit 'cogeneration,' which is the more efficient use of waste heat by otherwise nonrenewable sources. As defined by the statute, in addition to the classic sources of renewable energy including wind, solar, geothermal, hydropower, and biomass, 'Renewable Energy resource' means… Energy produced by cogeneration technology that is placed into service on or before December 31, 2015, and for which more than ninety percent of the total annual energy input is from combustion of a waste or byproduct gas from an air contaminant source in this state, which source has been in operation since on or before January 1, 1985, provided that the cogeneration technology is a part of a facility located in a county having a population of more than three hundred sixty-five thousand but less than three hundred seventy thousand according to the most recent federal decennial census.[8] Thus, an ordinary power station might update its technology to capture more of the waste heat generated during its regular operations and then claim that it is producing renewable energy. This has the grave potential to knock the wind out of the sails of even the minimal incentives for true renewable sources in Ohio including the wind industry (Wagner, 2012).

LEEDCO was dealt a sizeable setback in regards to energy policy when former Ohio Governor John Kasich signed a bill freezing the Ohio Renewable Portfolio Standard (RPS) in 2014 (Page, 2015). Kasich claimed that the reason for the freeze was to better understand the costs and benefits associated with supporting renewable energy. However, according to utility company filings, the RPS saved consumers roughly $230 million and reduced electricity rates by almost 1.5% (Page, 2015). This setback could make economic feasibility of the Icebreaker Project even harder to obtain.

However, in 2016 'John Kasich vetoed legislation that would have allowed investor-owned utilities to avoid making renewable energy investments for another two years' (Krouse, 2016). The bill would have extended a freeze on renewable energy standards, making them voluntary for 2017 and 2018 (Krouse, 2016). As a result, '[t]he veto of House Bill 554 means Ohio's traditional utilities as well as any other power company selling electricity [in Ohio] must supply an annually increasing percentage of power generated by wind, solar and other renewable technologies until that percentage is 12.5 percent in 2027' (Funk, 2016c). The standard was originally frozen at 2.5 percent, prior to 2014, but since then, standards have continued to increase. By 2017 the standard grew to 3.5 percent and then annually by 1 percent for until 2027 when it reaches its peak of 12.5 percent (Funk, 2016c). In 2017, Ohio legislators were once again attempting to end the REPS (Funk, 2017). However, this initiative seems to have ended for the foreseeable future as the new Republican governor, Mike DeWine, articulated an "all-of-the-above" energy strategy in March of 2019 including a strong commitment to renewable energy recognizing that 107,500 Ohioans were employed in the renewable energy sector in the latest 2017 figures (Duvelius and Tyler, 2019).

Despite both these economic and political challenges, wind energy retains a solid core of proponents, including officials at the Cleveland municipal and Cuyahoga County levels, who recognize that developing a wind industry in Cleveland would create sustainable jobs for decades, along with boosting the regional economy. The high costs associated with wind power, they assert, are due to the relative infancy of the industry. Thus, as the cost of construction in the region declines, opportunities for more expansion on the Lake will arise. Despite the odds, therefore, Icebreaker is fast approaching its goal for initiating construction in the summer of 2021 and LEEDCo's president, Dr. Lorry Wagner, posits that wide scale development may follow thereafter (Wagner, 2019). Indeed, the U.S. Department of Energy has lent a breath of fresh air granting LEEDCo a welcome $4 million (Murray, 2012), followed by another $250,000 grant in December of 2012 from the Cleveland Foundation (LEEDCo, 2012(a)), and finally given a strong gust in 2016 with another $40 million from the Department of Energy (Funk, 2016a).

The next section begins by providing the background of the formation of LEEDCo identifying the actors and factors involved in its initial creation along with the collaborative leadership aspects of this case. Subsequently, the technical and regulatory hurdles which LEEDCo and its predecessor, the Great Lakes Energy Development Task Force, have navigated are outlined. Finally, the case study ends with theoretical observations and recommendations for further research.

[6] Ohio Revised Code, Section 4928.64: Electric Distribution Utility to Provide Electricity from Alternative Energy Resources. See Ohio LawWriter at http://codes.ohio.gov/orc/4928.64 for the full text of the statute.

[7] See, the Public Utilities Commission of Ohio (PUCO) for links to the full text of the statute and Ohio's requirements http://www.puco.ohio.gov/puco/index.cfm/industry-information/industry-topics/ohioe28099s-renewable-and-advanced-energy-portfolio-standard/. The penalty may not fall below $45/megawatt-hour (MWh). The Solar Alternative Compliance Payment (SACP) is set and evaluated separately. See the Database of State incentives for Renewables and Efficiency (DSIRE) for a summary of Ohio's RPS standard http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=OH14R.

[8] SB305, Section 4928.01 [36a.viii-ix] also includes in subparagraph 8 'biologically derived methane gas' and in subparagraph 9 'energy derived from nontreated by-products of the pulping process or wood manufacturing process, including bark, wood chips, sawdust, and lignin in spent pulping liquors.'

5. Journey to a collaborative governance regime (CGR)

The journey that ultimately brought the Lake Erie Energy Development Corporation (LEEDCo) to life at the epicentre of this collaborative governance regime (CGR) is one that implicates a diverse array of public, private, and nonprofit stakeholders from across the Greater Cleveland Area. To this end, the four core elements of the collaborative leadership model (i.e., *activating*, *framing*, *mobilizing*, and *synthesizing*) are underscored below in the narrative. However, the story begins in 2002 with water rather than with wind. A prerequisite to any project is a group of committed policy entrepreneurs capable of softening the regulatory environment through engagement (Ryan, 2001, 230, 241; Page, 2010, 247–248). For this case study, this means briefly identifying the first efforts on the path to linking wind with Cleveland's larger sustainable movement as this clarifies the system context in which these drivers have been operating.

Perhaps the best place to begin is with an early project to make sustainable use of Cleveland's water's resources and an attorney. Attorney David E. Nash of McMahon DeGulis, LLP, the largest firm in Ohio concentrating its practice in energy and environmental issues in the Greater Cleveland Area, resolved in 2001 that he wished to give back to his community. He began assembling a team (*activating*) by having conversations with other like-minded individuals in the area including the well-known philanthropist, Albert Ratner, who connected him to Brad Whitehead, who at the time was the Senior Fellow for Economic Development at the Cleveland Foundation, and thereby Lisa Hong, the co-founder of the Corporate Sustainability Network (Nash, 2012). Concluding that their joint passions were for encouraging economic development in the Cleveland Area, they eventually pioneered a 'community action team' model for pursuing new business ventures thereby helping the players to agree to their roles (*framing*). The intent was to establish a looser coalition of individuals, strategically recruited, but without the administrative overhead, governance constraints, and other legal requirements attendant to seeking nonprofit status as a 501(c)(3) (Nash, 2012).

Thus, the plan was to inspire the commitment of various stakeholders (*mobilizing*) for the sustainable economic development platform in the Cleveland Area in the spring of 2002. To this end, Nash co-founded Sustainable Cleveland—now the Corporate Sustainability Network—and then worked with the Cleveland Leadership Center (CLC) [9] to create a new focus project on a proposal for 'H2Ohio' for sustainable use of Cleveland's water resources. The Cleveland Leadership Center also collaborated (*synthesizing*) with Cleveland Bridge Builders for the first time, which was a junior cadre of rising community movers and shakers. The more senior group looked into establishing a water institute for the region's water assets while the younger leaders worked on a market survey on the freshwater industry. While H_2Ohio later proved to be infeasible, the community action team model along with the concept of working on sustainability for Cleveland had taken hold.

Turning to wind, the initial concept of bringing wind energy to Cleveland had its start with the Cleveland Leadership Center's next class of 2004. Building on the momentum of the former H2Ohio Cleveland project, the new class was convinced that Lake Erie held promise for generating wind power. Once again, this confirms the observation in the literature that sustainability related projects often need to be tailored to the unique needs of the community (Koppenjan and Enserink, 2009), which was determined through the groundwork noted to be energy rather than water in this instance. This shift in focus from water to energy indicates a return to the first proposition of the collaborative leadership model which requires assembling a new team (*activating*). Thus, through a 2004 class project developed by President Ronn Richard and his Leadership Cleveland Focus Team, the Cleveland Foundation provided a grant to Green Energy Ohio to install an offshore wind monitoring station in the Cleveland Crib on the Great Lakes (Watterson, 2012). Named for its metal cage structure, the 'Cleveland Crib' is the main intake for the city's water supply and rests three miles north of the city in Lake Erie. This ideal site for the monitoring station thus provides access to wind speed and temperature in Lake Erie while solar panels supply the power needed to operate the tower. Rising 165 feet from the surface of Lake Erie, today the Cleveland Crib Wind Monitoring Station remains the only one of its kind on the Great Lakes (Green Energy Ohio, 2005). Thus, the wind monitoring tower became a focal point helping the players to agree to their roles (*framing*).

The second legacy of the Leadership Cleveland Class of 2004 was planting the seed of another monument to wind power. Specifically, the class approached the Great Lakes Science Center with the idea of installing an onshore wind turbine as a show of support for wind energy (Sievert, 2004). This quite directly satisfies the third proposition of the collaborative leadership model as this well placed wind turbine that appears to be floating on the Lake from a distance given its placement as close to the water as possible was precisely intended to inspire commitment in wind energy of involved stakeholders (*mobilizing*). The project was adopted and today the large wind turbine at the Great Lakes Science Center still spins as a quiet promise of more to come and helped to further cement the collaborative leadership arrangement between the various stakeholders (*synthesizing*).

As an equally important footnote, this project saw the introduction of the individual who was to become the key project steward capable of navigating various circles to push wind energy forward. Specifically, Dr. Lorry Wagner, a professional nuclear engineer with a doctorate from Purdue, had extensive experience in wind turbine technology. At this time, he was the President of Azure Energy LLC in Solon Ohio, which was the lead actor in the installation of the wind turbine at the Great Lakes Science Center. We will return to Dr. Wagner again the context of the formation of LEEDCo, the key CGR that was to emerge from these early activities.

Despite this groundwork of starting small, thinking big, and moving fast, building an offshore wind industry in Cleveland required a more organized leadership structure. Thus, for this third phase, we once again see the four propositions of the collaborative leadership model at work. First, the Cleveland Sustainability Network and the Cleveland Foundation early on connected with County

[9] The Cleveland Leadership Center (CLC) is the premier leadership non-profit for Cleveland focused on 'building and engaging civic leadership capital' (CLC). To accomplish this mission, the CLC offers a variety of renown leadership programs and other opportunities to inspire direct activism including Leadership Cleveland, Bridge Builders, (i)Cleveland, Look Up To Cleveland, and the Civic Leadership Institute.

Prosecutor Bill Mason and Assistant Prosecutor Steve Dever to discuss the next steps of how to go about building an industry (Nash, 2012; Dever, 2012). Significant support from key government actors would provide an important boost to the project and serve to safeguard the public's best interests as wind energy ultimately was intended to benefit the region rather than private concerns (Nash, 2012). In so doing, they also helped to provide 'process legitimacy' as the collaborators on the endeavour were more likely to participate given the sense of fairness and transparency the prosecutors office brought to the table (Page, 2010, 250). Once again, we see another new team being assembled (*activating*) with the right skill sets to move the project forward.

In large part as a result of these meetings which drew in other key regional actors, the Cuyahoga Regional Energy Development Task Force was formed in 2006 amidst enhanced momentum from the sharp spikes in fossil fuel prices that were particularly challenging for the regional economy. Later renamed the Great Lakes Energy Development Task Force, its mission statement is revealing as it provides an early clue to the chosen composition of the original Task Force,

> The Cuyahoga Regional Energy Development Task Force is to propose to the Commissioners and community a plan that will establish advanced energy as a critical component of the Region's energy portfolio and economic development profile designed to promote the Region's prosperity, health, welfare, and safety. This Mission shall include, but not be limited to, investigating and seeking to implement, where appropriate, advanced energy projects relating to energy supply such as renewable wind power and solar power, production of bio-fuels, such as ethanol, from bio mass materials or agricultural products, co-generation of electricity from surplus heat or steam from industrial facilities or other utilities, supporting the State of Ohio's Third Frontier Program related to fuel cells and projects relating to energy demand (Cuyahoga Regional Energy Development Task Force, 2007).

As both the name and the title of the initial Task Force seemingly implies, a preliminary goal would be to determine the participants in the project. This required bridging the gap between city and county governments with two different if complementary visions (Karpinski, 2012). Quite explicitly, we see the roles of the players clarified (*framing*). However, the first priority of the Task Force even at this early stage was indeed bringing a wind farm to Lake Erie (Watterson, 2012).

Perhaps unsurprisingly, the next steps were to inspire commitment of the stakeholders (*mobilizing*) and encourage additional collaborative arrangements (*synthesizing*). To represent the interests of the public in proceeding with the project at this early stage, Prosecutor Bill Mason was selected to chair the original Task Force. He also had the support of 24 other key notables from the region who served on the team (Kroll, 2009). For instance, Andrew Watterson, Manager of Sustainability for the City of Cleveland whose initial role in 2005 was to help facilitate the construction of the wind monitoring tower on Cleveland's water intake crib for Green Energy Ohio, represented the city's interests (Watterson, 2012). At the same time, Paul Alsenas, Director of the Cuyahoga County Planning Commission, served as a representative for the larger regional interests. Additionally, Professor David Matthiesen of Case Western Reserve University (CWRU) lent his expertise in energy. Likewise, then Assistant County Prosecutor Steve Dever who is currently the executive director of the Task Force sought the support of then Cuyahoga County Commissioner Tim Hagen to help reach the initial funding goals. Two years later in 2008, CWRU also provided enhanced research support through the newly established Great Lakes Energy Institute also funded in part by the Cleveland Foundation (GLEI 2012). In total, the Task Force received $2 million in initial support from a variety of sources including the Cleveland Foundation, Cuyahoga County, CWRU, the City of Cleveland, the Fund for Our Economic Future, the Cleveland-Cuyahoga County Port Authority, and the Generation Foundation (Kroll, 2009). All of these supporters brought a similar vision of hope that Cuyahoga County and, by extension, Ohio could serve as a world leader in the development of clean and advanced energy opportunities for the next generation (Dever, 2012).

The first project of the Task Force was to complete a thorough study of the feasibility of wind energy. Consequently, the Task Force commissioned a $1 million study of the project's feasibility which included dropping an 80 pound, $22,000 sonar unit into Lake Erie to measure ice thickness (Kroll, 2009). Moreover, with the Cleveland Crib Wind Monitoring Station in operation a year earlier and therefore capable of providing valuable data on the conditions for wind turbines (Green Energy Ohio, 2005), the Task Force would ultimately be well-armed with the requisite data. Consistent data monitoring was critical to ensure the reliability of energy production as well as to quiet any potential fears of underproduction. By 2008, the crucial feasibility study had concluded that offshore wind turbines were feasible and capable of harnessing significant wind power. Thus, when the data was retrieved from the sonar device and the project completed by April, the news was positive.

As a result, the culminating act was the establishment of the engine to see the project through. To be clear, a CGR titled LEEDCo, the Lake Erie Energy Development Corporation, was thus formed in August of 2009 after an agreement was reached among members of the Great Lakes Energy Development Task Force. The entrepreneur behind the pilot project, Dr. Lorry Wagner, now returned to become the president of the organization and the lead spokesman for offshore wind in Northeast Ohio. Through a multiplicity of venues he has crafted a simple message to capture public interest asserting that LEEDCo is 'trying to build a project and then an industry' (Wagner, 2012). Thus, when taken together, these activities were critical for establishing the conditions 'favoring collaborative governance includ [ing] mutual history and trust amongst participants; a shared sense of urgency, interdependence, and future interactions; a clear distribution of authority; and entrepreneurs or conveners willing to pay the costs to initiate public action' (Page, 2010, 247).

6. Building a project and then an industry

The question then arises whether Wagner's timing was right to begin the collaborative leadership steps of activating, framing, mobilizing, and synthesizing. To be sure, keeping the various constituencies activated while raising the necessary capital to see the project through would be a daunting task. Fortuitously, Ohio's demand for energy is immense as Ohio consumes 143.5 million megawatt hours (MWh) per year (U.S. Energy Information Administration 2012(b)). In 2018, the state's power production is mainly based on coal at 59.76%, natural gas as 24.18%, and nuclear at 13.56% (Ohio Public Utilities Commission). Renewable energy

sources, including hydroelectric power, only supply roughly 2% of Ohio's net electric generation (U.S. Energy Information Administration). Ohio produces very little renewable energy, ranking 45th in the nation for most renewable power generated in 2011 (EIA 2012(b)). In fact, Ohio ranks in 37 out of the 50 states in terms of on the list of least green states according to one account (Taylor, 2018), which is actually a substantial improvement over its last place rating in 2011 (Huffington Post: Green, 2011). Even so, positive news appears to be on the horizon as Ohio ranked second in the country after Michigan with over 105,000 clean energy jobs in 2017 (Skebba, 2017). In this setting, LEEDCo's initial project aimed to add a 20–30 MW wind farm to Ohio's grid, which could produce around 50 to 60 thousand MWh per year that would power over 5,000 homes (LEEDCo 2012(b)). Each MHI Vestas' turbine generates 3.45 MWs of power, with the project now committed to installing 6 turbines. Ohio already produced 174,812 MWh of wind energy per year in 2011 (U.S. Energy Information Administration, 2012(b)).

Even so, LEEDCo continues to struggle to find the most cost-effective way to install these turbines, which required Wagner to establish collaborative relationships with firms that possess cutting edge technology including the Norwegian firm Fred. Olsen Renewables. Without a doubt, an offshore wind farm is an engineering feat. Specifically, the wind turbines will individually be supported by a monobucket. Based on suction bucket technology, the underside of the bucket is open and sits on the lake bed. It is critical to note that the bucket cannot be installed any more than 0.5° from vertical meaning that exactitude in their placement is essential. In turn, the turbines should be mounted on a nearly vertical pile. Over time, it will settle under its own weight to establish a seal. Then, by pumping the water out, the differential pressure will drive the monobucket into the lakebed (Dvorak, 2015). Monopoles were considered, but found to be a challenge in Lake Erie soils, predominately due to the soil depth only being 80 feet and the emergence of bedrock. This environment would not create enough lateral stability for a monopole (Dvorak, 2015).

Wagner estimates that offshore wind turbines may require a payback period of 20 years before the investment is recovered. Since onshore wind is between 4 and 7 years, he concludes that this discrepancy is due to the infancy of the new offshore wind energy industry. While better wind speeds may be found farther out in the lake, unfortunately even though LEEDCo preferred to build them further from the city, they were not approved by the US Fish and Wildlife Service because the research was already complete. As this reveals, collaborative governance regimes (CGRs) are certainly not easy to establish and they require the prowess of a sophisticated project steward to maintain. Perhaps most importantly, the public sector typically spends much longer than the private sector in deliberations. This played an important part in the complex permitting process in this case.[10] Since Icebreaker promises to be the first freshwater wind project in the United States, it does not have the advantage of precedents to call upon for support in navigating the complex process of seeking approval of the numerous public agencies involved. As Dave Karpinski, Vice President of Nortech explains, '[f]rom a developer point-of-view this is not moving fast enough' (Karpinski, 2012).

Even so, due to Wagner's persistence, in 2011 LEEDCo was approved for a submerged land lease in the lake. Permitting for the project is nearly complete with construction on the horizon (i.e., 2021), costing roughly $125 million (LEEDCo). However, permitting was delayed in October of 2017 due to requests for additional information on potential wildlife impacts (Miller, 2018). The matter appears to have been resolved as of September of 2018 by an agreement between LEEDCo, the Sierra Club, and the Ohio Environmental Council such as bird-safe lighting and seasonal curtailment (Kowalski, 2018). LEEDCo continues to remain optimistic as it awaits the final decision of the Ohio Power Siting Board (2018) since the technical staff of the Board recommended proceeding with construction in their 2018 Technical Report recognizing the importance of not being too far out ahead of what regulators might be willing to approve. This proves the initial foresight of the Great Lakes Wind Energy Center's Final Feasibility Report in 2009, conducted by Juwi which is a world leading firm in renewable energy, that the goal should be to 'test and prove concepts, and promote technological and commercial development,' rather than 'to provide attractive economics as with a large-scale, commercial project' (Driedger-Marschall et al., 2009, 13–16). Establishing the precedent and thus breaking the ice in the policy sector is the ultimate key for those who would see Ohio tilting in the wind.

Aside from the technical aspects of the project, the overarching strategic business plan of wind energy advocates deserves note. Specifically, the ultimate goal is not only effective, but also orderly offshore development, which means offering 'speculators to work

[10] LEEDCo has amassed an impressive track record of approvals from various government bodies at the federal and state level since its inception. By way of example, federal regulatory review of the Icebreaker Project was completed by U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Coast Guard, U.S. Department of Defence, the Federal Aviation Administration, U.S. Department of Energy, U.S. Department of State, and Department of Homeland Security. The following are some examples of the certifications, permits, and approvals obtained from those agencies: Section 401 Water Quality Certification, Section 404/10 Permits, Positive US CG NVIC Recommendation, No Hazard to Air Navigation Determination from FAA, Statement 7 ESA Consultation Complete, Demonstrate Compliance with Clean Air Act, FONSI from USACE (NEPA), Approval for Alteration and Use of a Federal Navigation Project, and Letter of Concurrence from US Dept of State (IJC) Project Does not Impact Water Levels and Ice Flows. Ohio State authorities involved in the regulatory review included the multiple divisions of the Ohio Department of Natural Resources (i.e., Coastal Zone Management, Division of Wildlife, Division of Soil and Water Resources, Division of Watercraft), Ohio Power Siting Board, Ohio Department of Health, Ohio Department of Agriculture, Ohio Development Services Agency, Public Utilities Commission of Ohio, Ohio Environmental Protection Agency, Ohio Department of Transportation, The International Joint Commission, Ohio Historic Preservation Office (SHPO). Some of the state requirements obtained include a Submerged Land Lease, Statement Section 106 SHPO Consultation Complete, CZMA Consistency Opinion, and OPSB Certificate. To satisfy the requirements of the above federal and state agencies, LEEDCo collected massive data over multiple years including 5 years of Nexrad Weather Radar data (spring and fall), Marine Surveillance Radar (Merlin), a year of boat survey data, acoustical surveys (i.e., a year of data from microphones located onshore and at the Cleveland Water Intake Crib, multiple literature reviews of the available scientific literature, and risk assessment modeling. For an up-to-date rendition of the Icebreaker project's regulatory highlights including timelines of LEEDCo's progress, charts, maps, and other visual aids, please visit LEEDCo's website at: http://www.leedco.org/index.php/about-icebreaker.

through LEEDCo rather than cut[ting] deals with individual counties and port authorities, which could result in tying up large tracts on speculation, without any assurance of development' (Feather, 2010). As such, maintaining the support of both leaders and citizens in lakefront counties is a top priority for LEEDCo. Ashtabula County Commissioner, Peggy Carlo, for example, determined the importance early on of 'having a seat at the table' (Feather, 2010). Today, Ashtabula remains a strong presence with J.P. Ducro, IV serving as the county's appointed representative on LEEDCo's Board of Directors. Other county representatives currently serving on the Board include Lake County Commissioner, John Hamercheck and Lorain County Commissioner, Ted Kalo, along with County Executive Kathy Dahlkemper of Erie, Pennsylvania.[11] As these are elected representatives, maintaining effective relationships is a significant challenge for even the most savvy project champion. Thus, in addition to *activating*, *framing*, *mobilizing*, and *synthesizing*, felicity in *synchronizing* a project with the regulatory context is a critical fifth hypothesis to be added to the collaborative leadership model. Particularly where projects have a long time horizon from inception to completion as in the technically complex, heavily regulated, and competitive renewable energy sector, the prowess of the project steward to navigate the regulatory thicket over time is critical to the venture.

7. For further study

Considering the positive headwinds at the national policy level on renewing the Wind Energy Tax Credit along with the support of the U.S. Department of Energy (DOE), LEEDCo has continued to press onward and upward. Wagner's team is hopeful that LEEDCo's receipt of the additional large grant of $40 million will mean that the launch of the project is just around the corner. This was certainly in tune with the goals of the previous Obama administration (Department of Energy, 2012). Likewise, this CGR has continued to expand in novel directions. For instance, in April of 2019, LEEDCo partnered with the Cooperative Institute for Great Lakes Research (CIGLR) at the University of Michigan to share scientific data and research (LEEDCo, 2019). This collaborative effort involves 21 research organizations and the U.S. National Oceanic Atmospheric Administration (NOAA) (Lillian, 2019).

In the meantime, this revelatory, longitudinal case study responds to the call of the literature highlighting the critical importance of the system context and drivers that go into establishing a collaborative governance regime (CGR). As the foregoing analysis hypothesizes, an effective project steward must also be capable of *synchronizing* the undertaking with the extant regulatory parameters. That capacity implies both a high level of technical expertise along with a longer-term project commitment that is not necessarily associated with the brand of serial entrepreneurship typically associated with start-ups ventures. This case study also confirms that incentivizing CGRs like LEEDCo is an important part of the narrative to encourage long-term community projects like those in renewable energy specifically or any new technology more generally. Better understanding of how innovative policy entrepreneurship leverages all community assets that can be brought to bear is an important lesson.

Certainly additional lessons will emerge as well as this case study is read in juxtaposition to other projects faced with similar political, regulatory, and economic hurdles. As noted, other case studies involving renewable energy projects in the United States and specifically offshore wind energy have taken very different turns including the failed projects Cape Cod, Massachusetts and New Jersey which both suggest that absent an effective project steward, renewable energy projects are vulnerable to shifting political winds. However, there are also other success stories worth theoretically reviewing such as the first successful Brock Island Wind Farm off the coast of Rhode Island.[12]

What is clear is that this case study helps to drive the literature forward by paying "closer attention to the system context and drivers" in a CGR through a deep analysis of the Icebreaker Project (Emerson and Nabatchi, 2015, 223). Drawing upon the seminal research of Emerson and Nabatchi (2015, 162–163) which identifies three "species" under the CGR "genus" (i.e., self-initiated, independently convened, and externally directed), it is fairly clear that this case study falls into the "self-initiated" category as Icebreaker's "participants c[a]me together after being inspired and galvanized by a set of core stakeholders" in the Cleveland area. With the help of sophisticated project stewardship capable of synchronizing disparate interests in building this project within a constructed clement regulatory environment, this voluntary association has survived various challenges due to being anchored in common interests. This is not to suggest, however, that the two other species of CGRs are less successful in the renewable energy context. Nonetheless, those categories await further exploration.

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[12] For more information, visit http://dwwind.com/project/block-island-wind-farm/.

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