

Testimony of Scott Woodward on Senate Bill S.106 (“An act relating to establishing the Municipal Self-Governance Program”)

March 12, 2019

Dear Members of the Senate Government Operations Committee,

My name is Scott Woodward and I am a resident of Pomfret, Vermont. I come to you today in my individual capacity as a Selectboard member of Pomfret and as a resident of Vermont with a particular interest in municipal governance. My comments today reflect my views only and do not reflect the views of the Pomfret Selectboard. Prior to serving on the Selectboard, I served on the Pomfret Planning Commission and am also a current member of the Pomfret Capital Planning Committee. Beyond my involvement in town government, I’m also an alumnus of Vermont Law School. In addition to earning a J.D., I also earned a Masters of Environmental Law and Policy. I have also published commentaries on Vermont Digger related to the subject matter of S.106:

- “Municipal budgets will drive the future of town government” (<https://vtdigger.org/2015/08/19/scott-woodward-municipal-budgets-will-drive-the-future-of-town-government/>);
- “Vermont’s ‘homevoter’ effect” (<https://vtdigger.org/2016/08/10/scott-woodward-vermonts-homevoter-effect/>);
- “Land as an issue in Vermont’s affordability crisis” (<https://vtdigger.org/2018/11/09/scott-woodward-land-as-an-issue-in-vermonts-affordability-crisis>)

I applaud the intent of S.106. I do believe that local government needs attention in Vermont and I’m in accord with the notion that local government can be creative in devising and implementing solutions to local problems. I’m not convinced, however, that S.106 is the best way to effect the intent of the bill. I’m not sure the problems we have in Vermont are structural and if they are fundamentally structural, whether there might be better ways to tackle the issues related to local government. In short, I would ask the committee to contemplate and answer whether we need to alter Dillon’s Rule and experiment with self-government or whether local government is becoming weaker for other reasons? From a legal standpoint, there’s a real risk in having hybrid models of government coexisting in Vermont, particularly in a era of increasing regionalization. The spirit of S.106 is worthy, but there are better ways to accomplish its goals.

It’s my belief that local government is becoming weaker for other reasons unrelated to municipal law. To fulfill the intent of S.106, but in a different way, my recommendations to the committee are as follows:

- 1.) Identify those state laws, policies and procedures that inhibit or delay creativity and figure out how to redraft them in a way to allow for greater flexibility. In this regard, there may be an opportunity to reshape the commission contemplated in

section 5804 to be a commission that identifies obstacles and makes recommendations to the legislature on removing barriers that stand in the way of more creative local government problem solving;

- 2.) Spend the time to really understand the unifying theme that weakens local government. In this regard, I recommend that the legislature commission a study on the “homevoter” effect. There’s a strong correlation between state and local policies, particularly land-use policies, and home values. It’s my position that the “homevoter” effect is actually the root of Vermont’s local government challenges, whether it’s school financing, the encouragement of new businesses or the creation of the kinds of housing we need in Vermont. With my testimony today, I offer to the committee a paper by students of Professor of Economics William Fischel at Dartmouth College on how two wind turbine projects were rejected by voters in Grafton, VT and Grafton, NH. I also recommend to each committee member to read Professor Fischel’s book, “The Homevoter Hypothesis: How Home Values Influence Local Government Taxation, School Finance, and Land-Use Policies”;
- 3.) While it may not be in the purview of this committee, the legislature should look into whether a property value assurance program, similar to those in other parts of the country, and which Professor Fischel recommends in his book, might do more to strengthen local government (see chapter 11);
- 4.) The committee should identify laws within the current municipal law schema that create problems for local government and modify those laws. I’m happy to work with the committee to identify some of the laws that create problems and I’m sure VLCT could offer a list as well. There are opportunities to streamline and make our current municipal law schema more efficient than it is today;
- 5.) Lastly, I encourage the committee to craft a bill that would provide a mechanism to develop a vision for Vermont. It’s the vision for the future that should drive changes in local government. My personal vision is that I would like to see local governments become more self-reliant, but that doesn’t necessarily mean that we need greater self-government. The legislature should focus on creating the mechanisms for local governments to more easily work with each other, whether it’s fire protection, road maintenance, capital equipment acquisition, etc. As an aside, we do not need the regional planning commissions to become regional governments. Local governments should be encouraged to work together and the legislature should make every effort to facilitate that process.

Scott Woodward  
Pomfret, Vermont

$\Sigma$  voter reject wind turbines in ~~VT~~ VT  
NH towns, much discussion of effect on  
home ~~value~~ values.

## **A Tale of Two Cities**

*A survey of voters in Grafton, NH and Grafton, VT and why industrial wind projects were rejected in both cities*

Term Paper by Matthew Kim, Ben Wilson and Maximilian Wieland  
Instructor: William Fischel

Very good feedback. Some summary of  
interviews would be helpful. Overall analysis  
sound, but should check the claims about home  
value declines in Grafton etc.

## **Abstract**

With global climate change becoming a mounting worldwide concern, forward-thinking companies like Spanish-based Iberdrola Renewables have taken major steps over the last decade to adopt clean energy alternatives. The company has honed its interest specifically in wind energy production in Vermont and New Hampshire, which is a region well-known by environmental engineers for its consistent wind flows and well-positioned Appalachian ridgelines<sup>1</sup>. In this paper, we will discuss Iberdrola's recent proposals in Grafton, NH and in Grafton, VT, which constituents considered "extremely frustrating" and "divisive." We offer a wide range of economic analyses for both towns, but to start we explain the strong voter turnout and highly educated opinions in both towns through the "median voter" model, Oates' Regression, and Hedonic Price Theory. Further, we analyze the back-and-forth discussion between Iberdrola and the "Graftons," as we refer to them, through the Theory of Entitlements, exactions, and the Coasian Bargaining Theory. We believe that these two towns also provide a look into the behavioral economics of environmental quality, which can be explained through the Environmental Kuznets Curve. Lastly, we will further explain the behavioral economics of the "sour" cash payment offered to Grafton, VT and the reason why people like John, a 42-year-old town member, were originally pro-wind but changed their opinion in response to the cash payment.

## **Motivation and Methods**

Before we began our fieldwork, we established a general hypothesis. In keeping with the Coasian Bargaining Theory, we posited that the tax base subsidy and/or cash payment to both Graftons were not substantial enough to win over voters. To complete our study, we traveled to Grafton, NH and Grafton, VT to speak with several constituents. We asked numerous questions to these individuals and recorded their responses by hand:

- Are you from here?

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<sup>1</sup> Union of Concerned Scientists, retrieved on ([http://www.ucsusa.org/clean\\_energy/smart-energy-solutions/increase-renewables/wind-power-in-new-england-1.html#.WDSinryXjtg](http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/wind-power-in-new-england-1.html#.WDSinryXjtg))

- Did you take part in the most recent wind turbine complex vote that would have gone up in \_\_\_\_\_ (Zone 8 for Grafton, NH; Stiles Brook for Grafton, VT).
- How did you vote?
- Why did you vote that way?
- How far do you live from the project location?
- Did the cash payment/tax revenue influence your voting decision?
- Why or why not did this payment influence you?

*own home?*

While it is not technically possible to make statistical inferences from our data due to sample size and a lack of control variables, our survey allowed us to add color to a narrative on the way home owners vote when faced with a potential house price devaluation and compromised environmental quality. Despite many surface-level differences between the two Graftons, answers to the above mentioned questions were remarkably homogenous, including glowing reviews of the handsome 6' 5" Iberdrola salesmen.

### **Background on Grafton, New Hampshire**

The town of Grafton, New Hampshire was originally granted in 1761 and regranted in 1769. The town takes its name from Augustus FitzRoy, who was the 3rd Duke of Grafton. Located in scenic northwest New Hampshire, the 42.6 square mile town frequently attracts tourists interested in viewing fall foliage. The land is primarily used for subsistence farming and mining purposes, as there is a large supply of mineable mica in the area. According to the 2010 US Census, the town has a population of 1340 citizens. The median income for each household in Grafton, NH is \$38,654 compared to a US median of \$49,445<sup>2</sup>.

### **Background on Grafton, Vermont**

The town of Grafton, Vermont was founded on April 8<sup>th</sup>, 1754 and originally named Thomlinson. The name was changed to Grafton in 1791 by Joseph Axtell after his hometown in

<sup>2</sup> Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data (DP-1): Grafton town, Grafton County, New Hampshire". U.S. Census Bureau, American Factfinder. Retrieved July 10, 2012.

Massachusetts<sup>3</sup>. Throughout the 19th century, the town was notable for its woolen mills, the soapstone quarry and as a hub for stagecoach travel. Grafton had a population of 679 in 2010, up from the lows of 400 during the Great Depression but down from the highs of over 1000 before the Civil War<sup>4</sup>. The town is 38.37 square miles in size, and has a median household income of \$51,667 compared to a US median of \$49,445<sup>5</sup>.

## RESULTS

### Iberdrola Renewables Regional Background in The Graftons; Grafton, NH

A world leader in renewable energy, Iberdrola Renewables currently possesses a renewable asset base of over 14,000 megawatts (MW), which is spread throughout 12 countries in the world.<sup>6</sup> The company boasts over 150 years of experience in energy production and has earned high regards as the second largest clean energy producer in the U.S.<sup>7</sup> Over the last decade, Iberdrola has taken major steps in growing its renewable energy efforts, pledging to drive forward environmental ethics and stewardship efforts. In 2008, Iberdrola completed New Hampshire's first commercial wind farm in Lempster. Later, in 2012, Iberdrola continued their efforts in New Hampshire by building a wind farm complex in the Town of Groton. In 2013, Iberdrola set forth a proposal for 37 towers in Alexandria, Danbury, and Grafton (all towns in NH) that would each be 454 feet tall.<sup>8</sup> As the company claims, each project uses 100% renewable resources, and the windmills release no pollution into the surrounding environments. As an added incentive, the company cited that the implementation of wind turbine projects would create jobs and provide local landowners with the possibility of cash payments and/or tax deductions<sup>9</sup>.

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<sup>3</sup> Grafton Municipal Website, retrieved at (<http://graftonvt.org/>)

<sup>4</sup> 2010 Census American Community Survey (ACS), Grafton Vt

<sup>5</sup> Ibid.

<sup>6</sup> Business Overview, Avangrid Renewables, retrieved at (<http://www.avangridrenewables.us/business-overview.html>)

<sup>7</sup> Ibid.

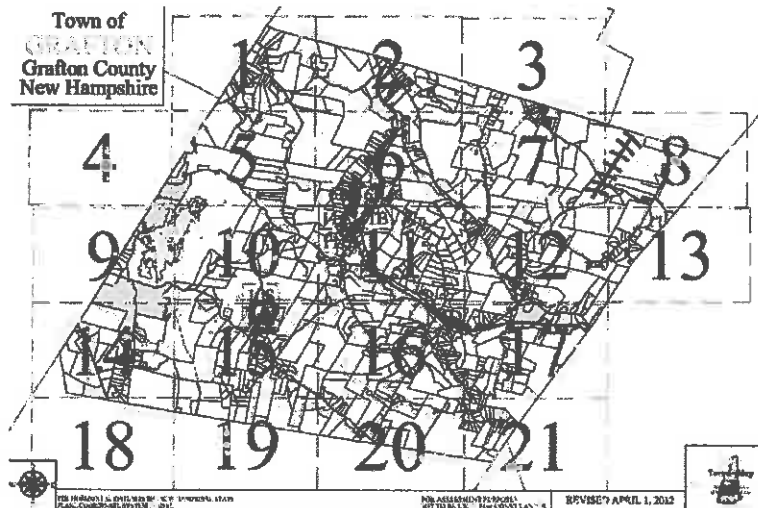
<sup>8</sup> Grafton Board of Selectmen, *Wild Meadows Wind Power Project*, October 17<sup>th</sup> 2007

<sup>9</sup> Ibid.

**Figure 1.1:** New Hampshire (left in dark green); Grafton County (right in red)



**Figure 1.2:** Grafton Town; Wind Project (zone 8) in blue



## Grafton, VT

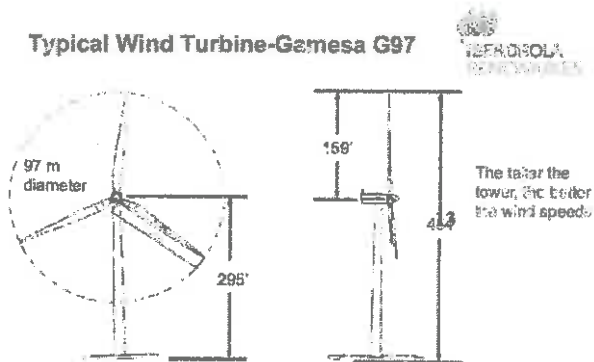
In 2012, Iberdrola entered a lease agreement with Meadowsend Timber Limited, the owner of Stiles Brook, a 5,000-acre tract that is located mostly in Grafton, VT and Windham, VT.<sup>10</sup> In the lease, both entities agreed to make available large-scale commercial wind installation. In 2013, Iberdrola set up three 197-foot meteorological towers used to test the wind in each site and announced their intention to set up 28 turbines (492 feet tall) that would generate over 97 megawatts (MW) of power. In 2015, Iberdrola announced that the company would pay

<sup>10</sup> Fahrer, Mike, *Developer Details Plans for What Would be State's Largest Windfarm*, on [vtdigger.org](http://vtdigger.org)

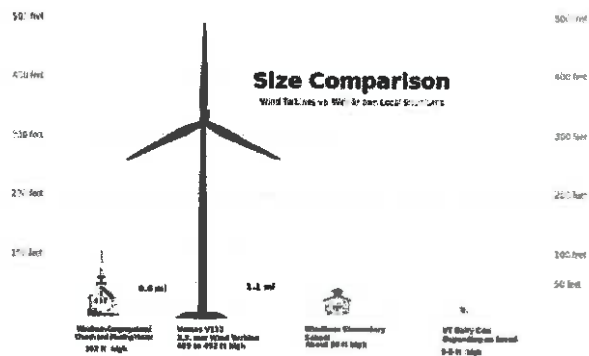
\$1 million in property taxes each year to Grafton and Windham (which they would later increase to \$1.5 million). In addition, the company estimated that states could receive up to \$700,000 in state education compensation.<sup>11</sup> Leading up to the November 8, 2016 vote, Iberdrola also approached individuals of Grafton and Windham with annual cash payment incentives of \$1162 and \$428, respectively.<sup>12</sup> On Election Day, both towns had a voter turnout above 75%.



**Figure 1.3:** Map of Windham, VT and Grafton, VT with town boundaries delineated with red boundary. 20 wind turbine locations for Windham are marked in light green, along with 8 turbine locations in Grafton (also in green).



**Figure 1.4:** A diagram of Iberdrola's wind turbine



**Figure 1.5:** A size comparison of Iberdrola wind turbine to buildings in Windham, VT

<sup>11</sup> Ibid.

<sup>12</sup> Fahrner, Mike, *Vermont Sec of State Questions Iberdrola Payments to Voters*, on vtdigger.org

<sup>13</sup> Grafton Board of Selectmen, *Wild Meadows Wind Power Project*, October 17<sup>th</sup> 2007



## Grafton, NH Opposition to Iberdrola Project

In 2012, Iberdrola Renewables released their plans to construct an industrial wind turbine complex in Grafton, Danbury, and Alexandria, NH that would sit upon the ridgelines of the Melvin, Forbes and Tinkham mountains. Residents living within a mile from the \$200 million project immediately vocalized concerns<sup>14</sup>, citing a lawsuit from Herkimer County, NY against Iberdrola in which more than 60 residents claimed that 37 wind turbines were causing health problems and dampening housing values:

“[Iberdrola] failed to adequately assess the effect that the wind turbines would have on neighboring properties including, but not limited to, noise creation, significant loss of use and enjoyment of property . . . diminished property values, destruction of scenic countryside, various forms of trespass and nuisance to neighboring properties, and health concerns, among other effects.”<sup>15</sup>

Don, who has been living in Grafton for over 20 years, cited housing values in Lempster in response to their 2008 wind project: “The houses in Lempster were always \$250,000. I can buy a house in Lempster, now, for \$60,000, and this is because you can see the wind turbines from the backyard.”<sup>16</sup> Cindy Kudlik, an outspoken anti-wind activist, mentioned in an interview that “what’s happened in Groton, NH is exactly what the more savvy residents of Grafton wanted to avoid. The lies told by Iberdrola about their Payment In Lieu Of Taxes being better for them has played out as expected there. Not only have their taxes increased but they’re also dealing with the physical ailments caused by the low frequency noise and are unable to sell their homes to move away without taking huge losses.”<sup>17</sup>

<sup>14</sup> Bryce, Robert, *Backlash against Big Wind Continues*, on nationalreview.com

<sup>15</sup> Citizens of Albany vs. Iberdrola October 2012, retrieved at [https://www.scribd.com/doc/114674283/Hardscrabble-Wind-lawsuit#download&from\\_embed](https://www.scribd.com/doc/114674283/Hardscrabble-Wind-lawsuit#download&from_embed)

<sup>16</sup> Don and Matt, Grafton NH respondents

<sup>17</sup> Cindy Kudlik, Grafton NH respondent



*Figure 1.6: Wind turbines in Groton,*

As NIMBYist concerns continued to mount in 2013, Grafton’s Office of the Selectmen drafted an ordinance to put an end to Iberdrola’s wind complex plans. Because the town has never had any zoning regulations and there are no county-wide zoning regulations, this ordinance was a rights to sustainable energy future and community self-government ordinance that acted primarily as a public statement against Iberdrola’s initiatives.<sup>18</sup> Clause A of Section 4 established that “[i]t shall be unlawful within the Town of Grafton for a corporation or any person using a corporation, to engage in land acquisition necessary for the construction of an unsustainable energy system, or to engage in construction or siting of any structure used in the operation of an unsustainable energy system.”<sup>19</sup> Clause E of Section 2 further states that the Town of Grafton defined unsustainable energy systems controlled by state and federal policies rather than community energy policy, and it specifically cites industrial scale wind power.<sup>20</sup> While Iberdrola had a legal right to build in Danbury, Alexandria and Grafton, the company nevertheless decided

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<sup>18</sup> Grafton Office of Selectmen, Grafton NH

<sup>19</sup> ORDINANCE

<sup>20</sup> Ibid.

to back out after the strong anti-wind opinions culminated in the Grafton, NH 2013 ordinance, a conservative decision to avoid the unwanted blemish to their reputation.

### Grafton, VT Opposition To Iberdrola Project



Not unlike the residents of Grafton, NH, the residents of Grafton, VT (and neighboring constituents of Windham, VT) voiced similar concerns regarding Iberdrola's proposal in 2014 to build wind turbines on a ridgeline called Stiles Brook. Stiles Brook Forest, a 5,000-acre property owned by Meadowsend

*Figure 1.7: Road construction on Lowell Mountain in Vermont. Construction roads for vehicles must be 40 feet wide and highly compacted, creating contamination and runoff problems for local wildlife.*

Timberlands Ltd, runs directly between Windham, VT and Grafton, VT.<sup>21</sup> While constituents cited the same detrimental health effects as a

primary reason against the wind proposal, we also found other opinions on the issue. In a newsletter published by *Friends of Windham*, a key environmental concern that constituents emphasize regarding turbine erection is water run-off. The topography of Windham and Grafton, VT is an important environmental factor. "The Stiles Brook tract is generally at an elevation of about 1,900-2,400 feet...heavy rainfall events, predicted to become more numerous in the future, cause the north and south branches of Saxtons River to swell. They converge in Grafton, which is why it and the towns further downstream have a recurring problem with flooding."<sup>22</sup> The land found in Windham and Grafton is heavily porous. This soil does not absorb water well, and as a natural barrier to flooding, patches of land like the "Meadowsend tract functions like a cluster of 'sponges' that absorb downpours"<sup>23</sup>. Critics of the turbines argue the construction process would result in an irreversible change to the area's topography. "A significant amount of land that is presently able to absorb rainfall and snow melt will become hard packed stone" which would

<sup>21</sup> Fahrer, Mike, *Wind Developer Iberdrola Changes Plans*, on vtdigger.org

<sup>22</sup> Friends of Windham, *The Environmental Impact of Wind Turbines on the Windham, Grafton and Townshend Ridgelines*

<sup>23</sup> Ibid.

“clearly increase the potential for flooding.”<sup>24</sup> Grafton, VT constituents also cite irreparable impacts on wildlife—similar to those concerns mentioned by Grafton, NH residents.

In a last-minute effort to sway voters’ opinions, Iberdrola also introduced a cash payment to the constituents of Grafton. “In Grafton, [Iberdrola] set aside \$215,000 for voter payments. The town’s 504 registered voters would each receive \$427 a year, or \$10,665 over 25 years.” Based on an interview conducted with a Grafton, VT constituent, the cash payment seemed to leave a sour taste in the mouth for most constituents. “It seemed like there was a larger motive at play,” remarked John, a 42-year-old resident of Grafton.<sup>25</sup> “I was originally going to vote pro-wind, but with the announcement of the sudden cash payment, I questioned where Iberdrola’s motives really lied.”<sup>26</sup> Interestingly, however, this payment differed drastically from the offer that Iberdrola made to Grafton, NH. Instead of a tax revenue paid directly to the town of Grafton, NH, Iberdrola believed that this time around, a direct cash payment to the citizens of Grafton, VT would work in their favor. We discuss the possible economic implications in our economic analysis. Though Iberdrola’s cash payment abided by the law, we were unable to conclude whether these cash payments acted auxiliary to Iberdrola’s plan.

Further, a Grafton, VT constituent named Miriam remarked in an interview that she voted no because “another dimension that people have to consider is that these projects don’t do what they purported.”<sup>27</sup> Uncertainty regarding the erection of these wind turbines and their effect on the Grafton economy worried constituents. “The Economic Committee of the Grafton Select Board [had] been studying the economic impacts of the proposed industrial wind development” and findings confirmed that “certain combinations of household income and property values will see no tax benefit because of the tax adjustments.”<sup>28</sup> In an interview with Elizabeth, a member of the Grafton Woodlands Group, the wind turbines slowed the sale of homes in the surrounding area.<sup>29</sup> By law, real estate brokers are required to disclose information regarding potential construction in the area; as such, Elizabeth claims that the sale of homes in Grafton and

*check out*

<sup>24</sup> Ibid.

<sup>25</sup> Field interview with John; 42, from Grafton, VT.

<sup>26</sup> Ibid.

<sup>27</sup> Interview with Miriam, 11/21/16.

<sup>28</sup> The Vermont Journal, *Iberdrola project could have an adverse impact on Grafton's attractiveness*

<sup>29</sup> Interview with Elizabeth, 11/21/16.

neighboring Windham had declined drastically.<sup>30</sup> This reflects potential homebuyers' fear that wind turbines would negatively impact the attractiveness to buy homes in the area.

With experiences from places like Grafton, NH, Iberdrola stated that while the vote is not binding, they would still respect Grafton and Windham's votes.<sup>31</sup> The developer could have ignored the town votes all together; however, Iberdrola recognizes the importance of public opinion. In the same interview with Elizabeth, she outlined that towns like Windham "do have a zoning bylaw that very specifically prohibits industrial wind development," yet "it did not matter."<sup>32</sup> Since wind energy is a publicly scrutinized debate, we presume Iberdrola strived to preserve their image such that they could build wind turbines in a different location in the future. Conclusively, in November, 2016, Grafton, VT (and Windham, VT) decided against Iberdrola's proposal. In Grafton, VT, 393 constituents voted: 235 voted no, and 158 voted yes.<sup>33</sup>

## ECONOMIC ANALYSIS

There are many economic theory applications that can help explain why voters and residents in Grafton, VT and Grafton, NH rejected Iberdrola's proposals. The Median Voter Model, Hedonic Price Theory, and Oates' regression analysis on capitalization help us understand why voters paid close attention to the vote and the voter turnout was so high. The Coasian Bargain in tandem with the theory of exactions and entitlements helps us understand why Iberdrola offered to compensate the towns and their residents, and that there was an efficient outcome that Iberdrola and the residents of both Grafton's could have met. Adding a tax price to the median voter model helps explain the effect an increase in town revenue from Iberdrola payments would have had on the tax price, as well as how a possible change in house values might have dampened this effect. Finally, the Environmental Kuznets Theory will help explain why voters in both towns rejected cash payments and reduced tax bills in favor of saving the environment they cherish. Ultimately, this section will section will look at possible explanations behind the negative reaction to the cash payment offered to individual Grafton, VT residents.

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<sup>30</sup> Ibid.

<sup>31</sup> Bielawski, Michael, *Voters in Windham and Grafton Anxious for Wind Turbine Vote*, in National Wind Watch, November 7<sup>th</sup> 2016

<sup>32</sup> Bielawski, Michael, *Voters in Windham and Grafton Anxious for Wind Turbine Vote*, in National Wind Watch, November 7<sup>th</sup> 2016

<sup>33</sup> *It's Official: Grafton and Windham vote NO to Iberdrola* on [graftonwindhamwind.org](http://graftonwindhamwind.org)

## **Application of the Jury Theorem and Capitalization**

The Jury Theorem says that if half of the population is more than half 'right' concerning a given election topic, the median voter will vote the correct result more than half of the time. The main function of the theory is to validate the median voter. The theory counteracts the ignorant voter and low voter turnout arguments which question whether voting outcomes are efficient. This study found that the voters in both Graftons were neither ignorant, nor was there a low turnout. In each town, if the surveyed individual was eligible to vote, they responded saying they had voted, except for one responder in Grafton, VT, who nonetheless was very knowledgeable about the topic. There was no respondent that was eligible to vote that did not have at least a substantiated and impassioned opinion. Voter turnout in Grafton, VT was almost 80%. In Windham, voter turnout was above 90% and thus the highest in the state of Vermont in the 2016 election. In fact, one respondent in Grafton spoke of a "deep divide" that emerged in the town. A pro wind voter referenced the abundance of anti-wind and no wind signs that "littered the town" but had come down by the time of our visit. Understanding why especially rural voters are knowledgeable about local issues and are politically active relies on the Hedonic Price Theory and that local amenities and other characteristics are capitalized in house values.

The Hedonic Price Theory suggests that a price can be derived from individual characteristics. Wallace Oates devised a statistical study published in 1988<sup>63</sup> that proved specifications such as the number of rooms, the quality of the local school, and local income distribution are capitalized in home values. For example, a greater number of rooms is associated with a premium house value, while poor SAT scores depreciate home values within a given community. Applying the median voter model to the capitalization study suggests that voters will take capitalization into account when making decisions on which way to cast their vote. In theory, suburban and rural towns have more engaged voters due to the high proportion of owner-occupied housing and the implications for real-estate asset values. Although house values have historically remained constant, since the '70s, house prices have been increasingly volatile, rising dramatically and falling heavily during the great recession. A house is usually an individual's largest single investment. Due to increased price volatility, homeowners engage themselves with local issues that might affect the price of their most valuable asset.



As previously stated, the median voter was validated by the elections in both Grafton, VT and Grafton, NH, with informed opinions and high voter turnout, complying with the Concordant Jury Theorem. Residents in Grafton, VT spoke of a deep divide in the community because of the election. The opinions of the town residents comply with Oates' findings that individuals are concerned about the way town planning and local decisions affect house values. Both towns are small and consist largely of owner-occupied housing. In 2000, Grafton VT had a 76% owner-occupied housing rate. Residents in both Grafton, VT and Grafton, NH referenced a potential fall in house prices, as a result of wind turbine construction, as a concern they considered when voting. Residents in Grafton NH referenced the precipitous house value decline in Portsmouth, NH and Lempster, NH due to recent wind park construction. A resident in Grafton, VT admitted she voted against the wind farm because her family recently moved into the area which would have seen the wind turbines erected close by.

*check this?*

Both Graftons had high voter turnout and voters with informed opinions, confirming the Jury Theorem. Residents in both towns cited concerns over house values thereby conforming with Oates, Hedonic Price Theory, and Tiebout. From an economic standpoint, Iberdrola can address these concerns by bargaining and eventually compensating residents for their legal property entitlements.

### **Application of the Theory of Entitlements, Exactions, and the Coasian Bargain in both Graftons**

Property owners have basic rights conferred on them by zoning and property law. Those rights include rights of exclusion, use, and transfer. Property owners have the right to exclude others from their property, the right to use the property for the purpose they wish, and the right to transfer the property to a third party, to sell or to rent. It is possible to put a monetary value on these entitlements, and negotiate the value of a given entitlement. In the examples of Grafton, VT and Grafton, NH, the residents' right to exclude Iberdrola and use the land to maintain a pristine natural environment is worth a dollar price. The tax rate in a given school district is given as:

$$\frac{\text{Public Good Expenditure}}{\text{Sum of Tax Base (Aggregated Home Values)}} = T$$

or,

$$T = \frac{G}{V}$$

There is a key difference in the compensation arrangements, and therefore Iberdrola's estimate of the dollar value of each town's legal property right entitlements. In Grafton, NH, Iberdrola's compensation scheme involved revenue to the town. In Grafton, VT, Iberdrola put together a package of entitlement payments and exactions. As well as town revenue in the form of scholarships for local fire services and the like, Iberdrola offered an unusual solution. The company offered direct cash payments worth around \$400 per resident per annum to purchase the legal property entitlements off the residents of Grafton, VT.

Figure 2.1 Entitlements Diagram

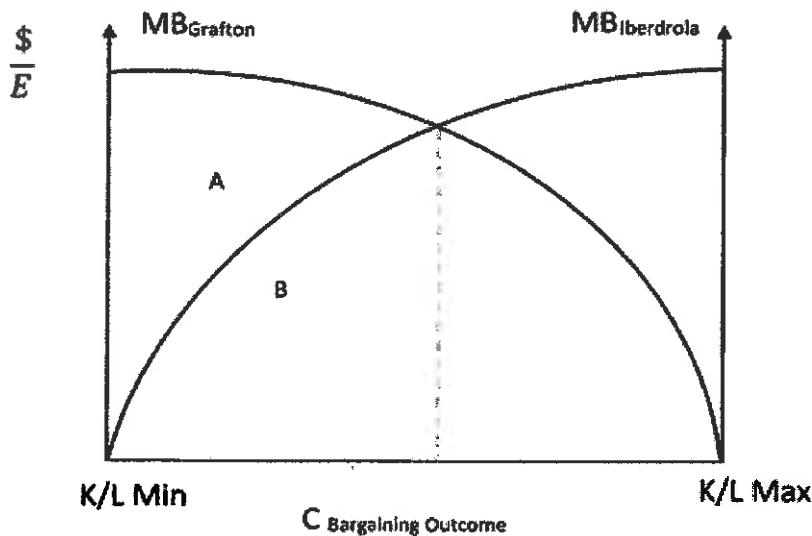


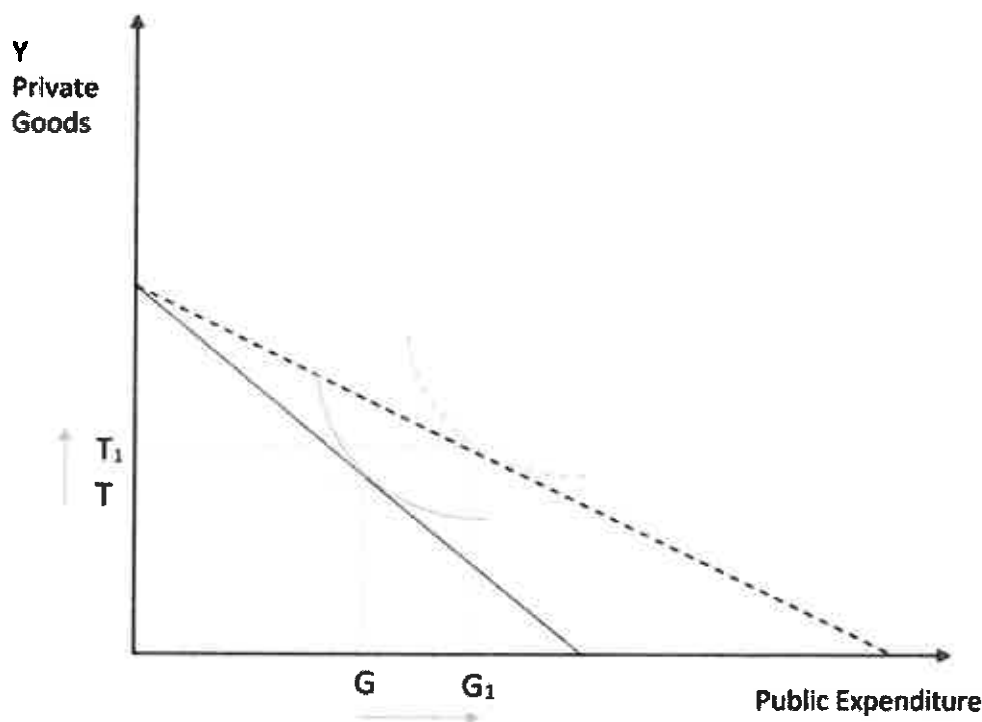
Figure 2.1 is an entitlement diagram, which represents entitlements in dollar value, as well as a marginal benefit schedule for each stakeholder in the bargain between Iberdrola and Grafton (applies to both VT and NH). While Grafton's marginal benefit schedule is maximized at a minimum capital to land ratio, in other words no wind turbines, Iberdrola's marginal benefit



scheduled is maximized at maximum capital to land ratio, in other words, the maximum number of wind turbines that each mountain ridge reasonably accommodates. Economist Ronald H. Coase posited that the initial allocation of entitlements has no effect on the eventual allocation of entitlements and thus the outcome of a bargain, given minimal transaction costs. In other words, a bargain with minimal transaction costs can lead both parties to reach

$C_{\text{Bargaining Outcome}}$ , where marginal benefit is maximized. This outcome is thus Pareto optimal.

Prior to the election, Grafton enjoys maximum marginal benefit since there are no wind turbines in either town. Iberdrola suffers minimum marginal benefit. Coase would suggest that the efficient outcome is  $C_{\text{Bargaining Outcome}}$ . The amount Grafton gains versus the efficient outcome is the sum of areas A and B. The cost to Iberdrola of buying Grafton's entitlement and therefore reaching the Coasian efficient outcome is B. In Grafton, VT, the cost of B was \$428 per annum per resident, in addition to lowering the tax rate for residents by adding revenue to the town's tax base, which amounts to \$1,500,000 on top of \$700,000 for school grants. In Grafton, NH, B would be Iberdrola's payments to the town worth \$150,000 per annum.



*Figure 2.2 Tax Price change because of Iberdrola's contribution to town revenue*

Figure 2.2 shows the change in the tax price of both Graftons that would occur as a result of the Iberdrola offers. The payments to the town reduce the amount of money spent on public services (mainly the local school). This lowers the nominator in the equation (2.1)

$$T = \frac{G}{V}$$

where G is expenditure on public services and V is home values. Figure 2.2 depicts the median voter tax price

$$T = \frac{V_i}{V/N}$$

where  $V_i$  is the value of the median voter's property and N is the household population of the community. However, the median voter tax price is derived from the tax rate equation. For argument's sake, we assume that a potential reduction in the price of housing does not offset the reduction in government expenditure as a result of the Iberdrola offer. Therefore, T will come down, which means a reduction in the tax price to the median voter. This shifts out the budget constraint of the median voter, and allows for a greater expenditure on public services, such as better schools, a professional fire service, or better roads for example, as seen by a shift in figure 2.2 from G to  $G_1$ . In addition, some of the Iberdrola money will go to reducing taxes for both Graftons. This is shown on the diagram as a shift from T to  $T_1$ .

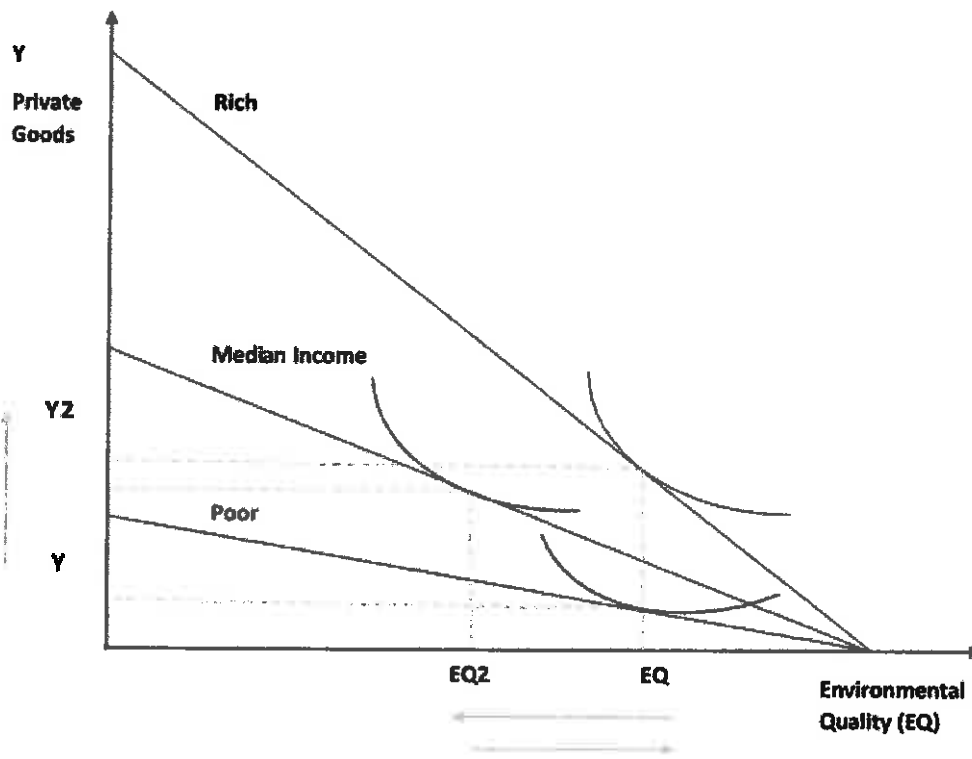
In both Graftons, respondents cited concerns about wind farms actually increasing the tax price to the median voter. For this to happen, the wind turbines would have to reduce house prices in the area, and therefore reduce the denominator in equation 2.1. Instead of the budget line shifting outward in figure 2.2, the budget line for a community in which wind parks reduced the property tax base would shift in, thereby reducing incomes and reducing the amount of money spent on public goods such as schools. In the case of Grafton, NH, the owner of the general store in neighboring Danbury told us that the community was weary of cases in Lempster and Portsmouth where tax prices had crept up due to house price devaluation, despite town revenue increases due to payments by Iberdrola. The environmental Kuznets Curve is a possible way of explaining why the residents of both Grafton's turned down Iberdrola's offer, while exposing an important difference in the behavior of the two communities.

*some confirmation would help, the belief is important, too*

## Environmental Kuznets Curve

The Environmental Kuznets Curve presents a trade-off between environmental quality (EQ) and increased private income (Y). Increased private income can come in the form of more jobs through industry for example, or a tax break. The theory predicts, as shown by figure 2.3, that there is a backward bending supply curve, in that low-income communities (or countries) have little or no industry, but inhabitants enjoy a high level of EQ as the nature around them is left in-tact. Industrializing countries or middle income communities tend to allow industry to move in. Incomes rise but at the cost of environmental quality. Incomes move to Y1 from Y, but EQ drops to EQ2. As a community becomes richer than the median, incomes increase from Y1 to Y2, but some of the income growth is substituted for improved environmental quality, which moves back to EQ from EQ2.

*Figure 2.3: Environmental Kuznets Curve shows the trade-off between EQ and Y, applicable to both Grafton VT and NH*



This framework can be applied to explain both why both Graftons voters cited environmental concerns most frequently in substantiating their vote against the Iberdrola project, as well as highlighting a key difference between the richer Grafton, VT and the poorer Grafton NH and their reasons for rejecting the plans. Grafton, NH has a median household income of \$38,654.<sup>34</sup> This is compared to Grafton, VT which has a median household income of \$51,667 compared to a US median of \$49,445.<sup>35</sup>

Both Graftons should therefore demand EQ rather than EQ2, but for different reasons. This is confirmed by the type of response received from residents of both Grafton, VT and Grafton, NH. In Grafton, NH, the environmental concerns were largely based on wildlife and hunting. Residents cited the harm wind turbines inflict on birds and deer population. In Grafton, VT, the focus was on the visual disturbances of the turbines to town residents and tourists. Groton, NH, which has a median household income of \$44,583 agreed to the construction of wind turbines. Although this narrative cannot be substantiated with statistical evidence in this study, it seems as though residents of Grafton, NH objected to wind turbines on grounds of disturbing the wildlife around them. In theory, Groton, NH agreed to wind turbines in a manner typical for a middle-income country or community. Although it is difficult to prove, the Kuznets Curve predicts a community like Groton being willing to sacrifice some of its environmental quality to advance its median income. Grafton, VT on the other hand sits above the national US median household income, and is willing to forego even higher incomes to preserve its environmental quality, but for different reasons than Grafton, NH. It is therefore not surprising that respondents in both Grafton, NH and Grafton, VT did not care for tax price reductions or cash payments respectively, and that their decision to vote on wind turbines was heavily influenced by environmental concerns.

✓  
criticism?  
Groton

### The Cash Payment vs Town Revenue In lieu of Taxes

The difference between a cash payment and an increase in town revenue in lieu of taxes is important to explain, since four respondents in Grafton, VT complained about money going to individuals, citing that they might have changed their mind had Iberdrola offered more money to

<sup>34</sup> Profile of General Population and Housing Characteristics: 2010 Demographic Profile Data (DP-1): Grafton town, Grafton County, New Hampshire". U.S. Census Bureau, American Factfinder. Retrieved July 10, 2012.

<sup>35</sup> 2010 Census American Community Survey (ACS)

community projects. Intuitively, one would assume individuals respond to cash payments more favorably than payments to the town. Furthermore, cash payments to individuals are often cheaper than large scale projects donated to a given community as part of an exaction to purchase entitlements. However, voters often respond more favorably to community projects over relatively menial cash payments, as was the case in Grafton, VT, even though a payment to the community is technically nothing but a cash payment to the median voter. The logic possibly stems from the idea that a payment to the median voter entails a substitution effect which results in higher public spending, rather than 100% of the cash payment going to increasing Y (private income).

not in m.v.  
Berry

## Conclusion

The Graftons study reveals that in some cases, exactions simply cannot win over homeowners. While in both cases Iberdrola had the legal backing to complete each project, the Grafton homeowners in New Hampshire and Vermont continually decried the importance of environmental quality and steady, long-term housing values. Together, both examples show that important theories of public economics hold. For one, voter turnout was extremely high in both Graftons and the vast majority of voters revealed informed opinions on the matter. This proves the Condorcet Jury Theorem and disproves the notion of an ignorant and lazy voter. Both Graftons also prove that high levels of homeownership correspond with political engagement, as outcomes may be capitalized in home values. This is in keeping with Oates and Tiebout. Finally, the idea that both communities cherished environmental quality but for slightly different reasons lends weight to the concept of an environmental Kuznets Curve. In fact, the ever present fear of wind parks leading to house price devaluation and a staunch defense of environmental quality disproved our initial hypothesis which assumed bargaining parties would reach an agreement, in keeping with Coase.

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## **Interviews**

Interview with Miriam, 11/21/16, Grafton VT

Interview with Elizabeth, 11/21/16, Grafton VT

Interview with John, 11/19/16, Grafton, VT

Interview with Don and Matt, Grafton NH

Interview with Cindy Kudlik, Grafton NH