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석사학위논문

풍력발전에 대한 지역주민의 인식에 관한 연구
- 제주도 거주 내국인과 외국인을 대상으로 -

A comparison of perceptions towards wind power
among local and foreign residents
of Jeju Island, Korea

제주대학교 대학원

행정학과

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2014년 2월

**A comparison of perceptions towards wind power
among local and foreign residents
of Jeju Island, Korea**

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(Directed by professor Kee Min)

**A thesis submitted in partial fulfillment of the requirement
for the degree of Master of Public Administration**

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This thesis has been examined and approved.

Department of Public Administration

GRADUATE SCHOOL

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Abstract

South Korea is becoming a world leader in renewable energy technology. As a country that imports 98% of its energy, it has made a bet on renewable technology in its “Low Carbon/Green Growth” energy development policy. Jeju Island, famous for its seemingly endless supply of wind has become the centerpiece of wind energy development in Korea. In 2012, Jeju announced its “Carbon Free Island Jeju by 2030” To meet its goal by 2020, Jeju plans to install on-shore wind turbines 300MW, offshore turbines (1GW) and solar panels (30MW). There are currently eight onshore wind farms operating in Jeju producing 107MW of electricity.

The research in this study focuses on the attitudes of people towards wind power on Jeju Island. The perceptions of the foreign residents can provide a unique insight into the discussion of attitudes towards wind power. Korea is a newcomer to the development of wind power and Jeju Island is the first place in Korea to provide power by the wind. As Jeju proudly states in its advertising and mottos, “To the world with green wind” and “The world comes to Jeju and Jeju goes to the world,” the Jeju residents are concerned about their world image. The foreign residents can provide perspectives from their experiences in their home country to which the local residents might not have been exposed.

The purpose of the study is to compare the attitudes of foreign and local residents of Jeju Island and see if there is a difference. The results are then compared to the literature. The comparison between the two groups using an independent samples t-test highlights the concerns of the Jeju Island people. On the whole, the Jeju Island people have more concerns about wind power than the foreign residents. The local residents have less general support, more concerns about the environmental effects of wind farms, more doubts about economic effects of wind farms, and less knowledge about wind farms in general. The results also

show that Jeju residents express the desire for public control of wind farms, which could help improve support while bringing community benefits.

Although large general support is found, it is recommended that the local residents' concerns be considered if Jeju is to meet its carbon free goal by 2030. Public participation can be encouraged through the promotion of knowledge about wind energy in general and about Jeju's wind energy plans.

Keywords

Wind farm, Wind power, Wind energy, Public perceptions, Korea, Jeju Island

국문요약

대한민국은 이제 신 재생 에너지 기술 분야의 세계적인 선두 주자로 발돋움 하고 있다. 바람으로 유명한 제주도는 한국 최고의 풍력발전 후보지이다. 현재 제주에는 146MW 의 전력을 생산하고 있는 풍력발전소가 있다. 지난 해 제주도는 “2030 년 탄소제로의 섬, 제주” 계획을 발표했고 이 목표를 달성하기 위하여 앞으로도 많은 풍력발전 시설이 설치될 예정이다.

본 연구는 제주도의 풍력발전에 대한 사람들의 태도와 인식에 초점을 맞추고 있다. 제주거주 외국인의 태도는 풍력발전에 대한 논의에 독특한 통찰력을 제공 할 수 있다. 한국은 풍력 발전에 새롭게 발을 디뎠고 제주도는 국내 최초의 풍력발전소이다. 제주가 자랑스럽게 “녹색바람 세계로”, "세계가 찾는 제주, 세계로 가는 제주 " 등의 모토를 내세우는 것을 보면 알 수 있듯이 제주 주민들은 세계인이 가지는 제주의 이미지를 중요하게 생각하고 있다. 제주거주 한국인은 외국생활을 경험했을 가능성이 낮고 제주거주 외국인은 각자의 모국에서 경험을 바탕으로 한 관점을 보여줄 수 있다.

연구의 목적은 제주거주외국인과 제주거주 한국인의 인식을 비교하고 차이가 있는지 확인하는 것이다. 이 결과는 다른 문헌 비교될 수 있다. 독립 표본 t-검정을 사용한 두 그룹 간의 비교를 통해 제주도 사람들의 우려를 확인할 수 있다. 대체로 제주거주 한국인은 외국인보다 풍력 발전에 대해 더 염려하고 있다. 제주거주 한국인은 일반적으로 더 적은 지지를 보여줬다. 풍력발전의 환경적 영향에 대해 더 많이 우려했고, 풍력발전의 경제적 효과에 대해 더욱 의심했으며, 그리고 풍력발전에 대한 전반적인 지식이 더 적은 것으로

나타났다. 또 제주거주 한국인은 풍력발전이 정부에 의해 운영되기를 바라고, 여기에서 나오는 경제적 효과는 지역사회의 이익을 위해 사용되어야 한다고 생각하는 경향을 보였다.

아무리 충분한 지원이 있다고 하더라도 제주지역주민의 우려가 고려되지 않고서는 ‘2030년 탄소제로의 섬, 제주’라는 목표를 달성할 수 없다. 지역주민의 참여는 풍력발전에 대한 전반적인 지식과 제주의 풍력발전계획을 아는 것으로부터 이끌어 낼 수 있다.

Definitions

Wind Turbine – A single device usually with three blades that spin to generate electricity

Wind Farm – A group of wind turbines

Wind Power – Electricity created from wind farms

Wind Development – The construction of wind farms

NIMBY – Not In My Backyard

NIABY – Not in Any Backyards

YIMBY – Yes in My Backyard

PIMBY – Please in My Backyard

KW – Kilowatt

MW – Megawatt

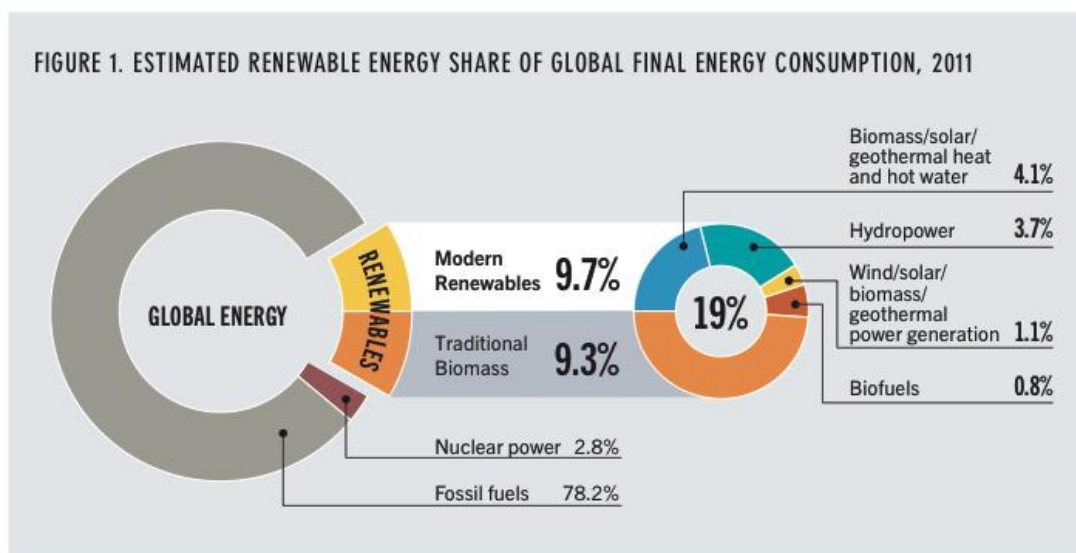
GW- Gigawatt

I. INTRODUCTION

1. Background

The adoption of renewable energy technology around the world is gaining pace. In 2010, renewable energy sources supplied 16.7% of global final energy consumption with 8.2% of that total coming from modern renewables as can be seen in figure I-1. By the end of 2011, total renewable power capacity exceeded 1,360 GW, providing more than 25% of global power-generating capacity (REN21, 2012).

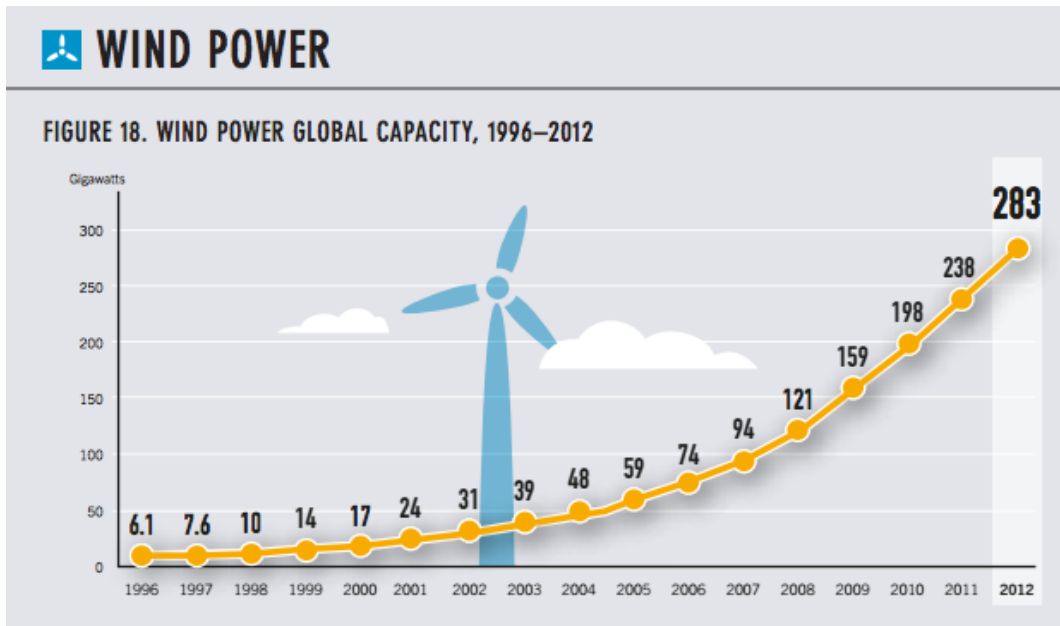
<Figure I-1> Estimated renewable energy share of global final energy consumption, 2011



Source: REN21 (2012)

Wind power has become one of the most visible symbols for renewable energy technologies. Figure I-2 shows how worldwide wind power capacity increased 20% in 2011 to 283 GW making this increase rate the largest of any renewable technology (REN21, 2012). At the same time, onshore wind turbine prices fell between 5% and 10% (UNEP 2012). Wind power has come and it is here to stay.

<Figure I-2> Global wind energy capacity (REN 21)



Source: REN21 (2012)

Energy demands are a reality and driver of the modern economy. South Korea is not blessed with the natural resources that many other developed countries can enjoy. Instead, South Korea must import nearly 98% of its energy needs. This puts a significant strain on South Korea and as the country develops, this strain is forcing it to find an affordable and self-sufficient solution. As a result, South Korea is intent on becoming a world leader in renewable energy technology. Since 2008, the former President of Korea, Lee Myung Bak announced a “Low Carbon/Green Growth” development policy to promote green energy. A large part of this plan comes from wind power.

Jeju Island, famous in Korea for its seemingly endless supply of wind, has become the centerpiece of wind energy development in South Korea. Jeju is the home to the first wind farm in Korea. There are currently eight onshore wind farms and two offshore demonstration sites with plans to build more.

Jeju Island is a known and well-established destination in the domestic tourist market. Seoul to Jeju is the world's busiest commercial passenger air route with 9.9 million passengers per year. People come to Jeju to escape the big cities of mainland Korea to relax in the island's natural beauty and fresh air. Jeju is the home to three UNESCO World Natural Heritage sites, South Korea's largest mountain, and stunning beaches. Needless to say, Koreans are proud of Jeju Island.

Relationships between local people and governments are an integral part in the development of renewable technologies. Wind power has been met with resistance in all parts of the world, from the first large scale wind power development installations US in the 1990s to the NIMBYs in the UK, although wind power in general has broad support, the resistance has been fierce at times.

2. Purpose

The research in this thesis will focus on the attitudes of people towards wind power on Jeju Island. Concerned about the rapid growth of wind power developments and possibility of corresponding growing conflicts (or lack of) over wind development in Jeju, this study seeks to find the reasons.

The perceptions of the foreign residents can provide a unique insight into the discussion of conflicts on wind power. Korea is a newcomer to the development of wind power, and Jeju Island is the first place in Korea to provide wind power. They will provide their perspectives from their home country's experience that the local residents might not have had. The foreign residents included in this study have enough interest to spend a year or more of their lives living on the island. Their interest in the island might focus around different perspectives than that of the local people. A comparison between the two groups can highlight the concerns of the Jeju Island people. In regards to wind power, the front page of Jeju's English language website (english.jeju.go.kr) says "To the World with Green Wind."

Jeju Island's motto is "The world comes to Jeju, and Jeju goes to the world." Jeju Island's people are obviously concerned with how the world views their home, and this study can provide some insights on how Jeju compares with the world, and how the world might view Jeju.

3. Format of Thesis

The thesis is organized as follows. Chapter two will begin with a brief background of Jeju Island and of its energy history. The discussion on the literature will discuss the complex formation of attitudes towards wind power. I will identify major theories from the literature that explain attitudes towards wind farms. Chapter three will introduce the survey, the questionnaire that was used to measure the attitudes and perceptions of the local and foreign residents of Jeju Island. Chapter three will also present the hypothesis and describe how the survey will be evaluated. The attitudes and perceptions of the residents are compared and the results are presented in chapter four. Finally chapter five will present the conclusions, policy implications of the research, and future directions.

II. LITERATURE REVIEW

1. Jeju Island

Jeju, the largest island in South Korea (1,849km²), is located approximately 100km south of the mainland. The island is a shield volcano with Halla Mountain rising predominantly in the center and is a generally flat and oval shaped. Jeju's population of nearly 600,000 is concentrated into two cities, Jeju City in the north and Seogwipo City in the south. Jeju is divided administratively into the cities and into north and south rural areas. Jeju is well known throughout Korea for its natural beauty and its abundance in three resources: wind, rocks and women. Of these three abundances, much attention recently has been focused on the wind.

Jeju's economy is traditionally based on agriculture and marine products. Jeju's most famous and unique cultural asset is the Hanyeo, women who free-dive for shellfish and other marine products. Jeju tangerines are also hugely popular throughout Korea and play a large part in the local economy (Ko, 2008).

In recent years the focus has moved from agriculture to tourism. In fact, tourism is grows at 4.5% annually and makes up 70% of Jeju's economy (Woo, 2013). According to the island's official website, english.jeju.go.kr, Jeju receives 8.7 million tourists annually. Tourism comes both domestically and internationally with 2 million international visitors coming in 2013. The tourists come by cruise ship and by air. Jeju is within close proximity to many urban centers. Budget airlines now offer flights direct from Shanghai, Tokyo, Hong Kong, Taiwan, and Bangkok.

In developing its tourist economy, Jeju proudly and heavily promotes its international environmental designations. The island was first designated as a UNESCO

Biosphere Reserve in 2002. Since then, it has also become the home of three UNESCO World Natural Heritage sites and eight UNESCO Global Geopark sites. Jeju utilizes this green image to its fullest extent in promoting its tourism-based economy.

South Korea imports 98% of its energy from other countries making it the world's ninth largest energy consumer with coal, oil, and natural gas accounting for 84.2% of the country's energy use (Whang, 2011). It is the second largest importer of liquefied natural gas in the world behind Japan and two-thirds of South Korea's electricity is provided through thermal power plants (Kim et al, 2008) making South Korea the eighth largest emitter of greenhouse gasses in the world (Whang, 2011). As pollution becomes a concern, Korea is looking further and further into renewable energy sources including biomass, hydro, solar, and wind (Kim et al, 2008).

In 2008, the Lee Myung-bak administration announced a "Low Carbon, Green Growth" strategy in an attempt to improve Korea's national economy by replacing its dependence on fossil fuels with focus on sustainable development green technology and green industry South Korea showed its commitment to green energy when it allocated 81% of its 2008 fiscal stimulus package to renewable energy sources (Economist, 2009). Studies show that Koreans are willing to pay for green electricity (Yoo, 2009).

Following President Lee's initiative, in 2012 Jeju announced its "Carbon Free Island Jeju by 2030" plan in which Jeju plans to be fully self-sustainable with renewable resources by 2030. To meet its goal by 2020, Jeju plans to install onshore wind turbines (300MW), offshore turbines (1GW), and solar panels (30MW). In addition to renewable energy, Jeju is the home of the smart grid test bed where the consumer has real-time communication with the power company and is able to sell energy that is created through solar panels affixed to the house back to the power company (Jeju Weekly, 2012).

The electricity on Jeju is primarily provided by three sources, thermal, HVDC, and wind farms. The two HVDC lines connect Jeju to mainland Korea's power grid and provide 30% of Jeju's receiving power. The several thermal plants spread throughout the island provide 70% of the island's electricity consumption. The remaining power is brought to Jeju's grid by the wind farms. In 2011, Jeju's summer peak load reached 656MW with an anticipated load of 706MW for 2013 (Yoon et al, 2009).

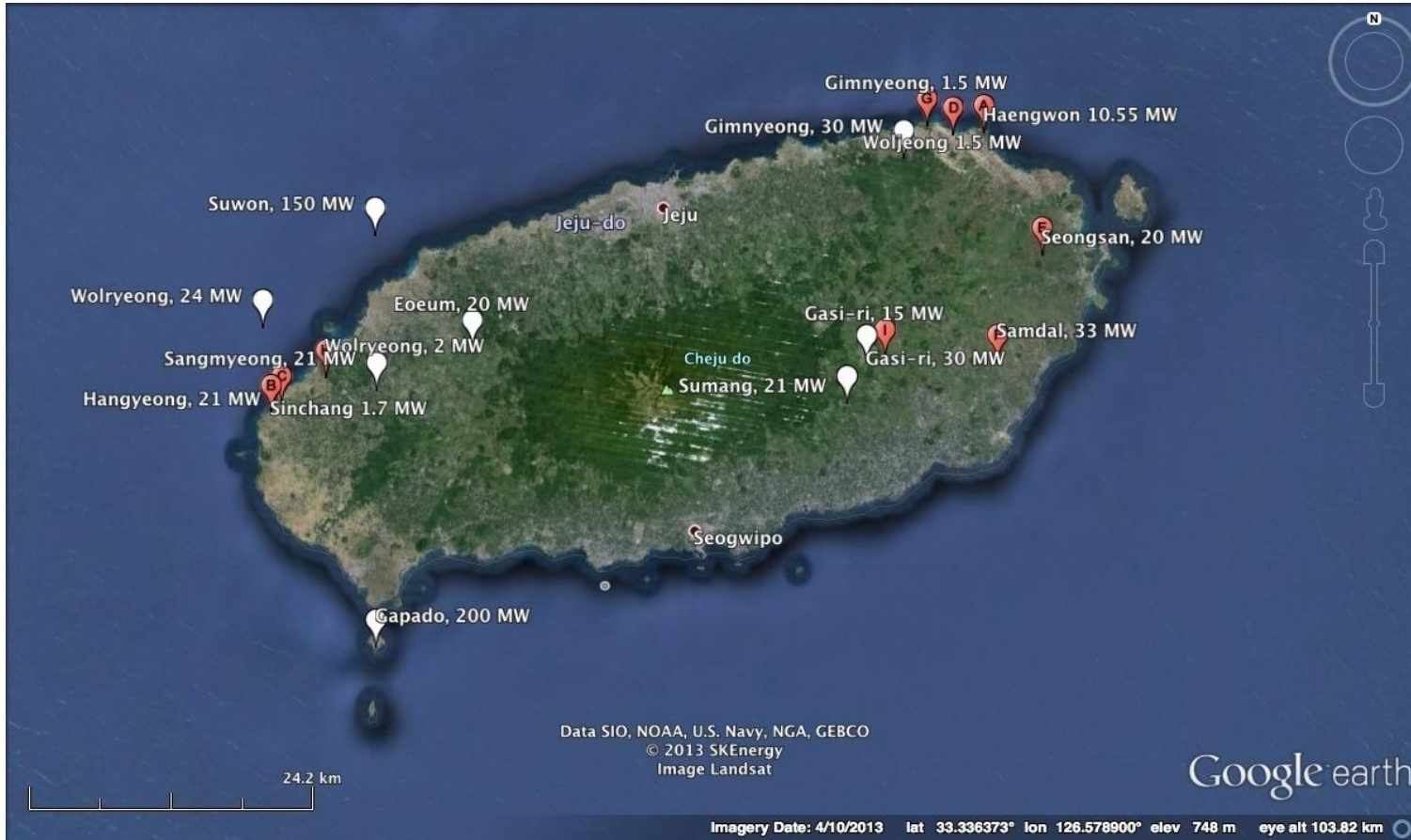
Jeju is home to the first commercial wind farm in Korea. The 9.8MW capacity Hangwon wind farm was finished in 2003 and is located on the northeast coast of Jeju. This was followed by the 6MW capacity Hankyung wind farm on the west coast of the island. A reasonable capacity factor of a wind farm is 20% (Lu et al, 2009). The average monthly capacity factors for the Hangwon and Hankyung wind farms are 20.5%. These capacity factors are high compared with other countries (England 27%, Denmark 20%, Germany 15%) showing the strong potential for wind power in Jeju (Kim et al, 2008).

In 2012, Funded by the Jeju Special Self Governing Province, the Jeju Energy Corporation officially opened. The Jeju Energy Corporation as a public enterprise whose purpose is to help Jeju achieve its renewable energy goals. The Jeju Energy Corporation presented its initial plans to build two offshore wind farms totaling 350MW off the west and southwest coasts of Hallim and Daejeong (Jeju Weekly, 2012).

There are currently eight wind farms operating in Jeju as of 2012 are presented in Table II-1. The wind farms produce a maximum capacity of 106.25MW. The wind farms are owned and operated by not only the public Jeju Energy Corporation, but also various private entities. Table II-1 also explains how the planned projects of how Jeju will meet the wind power aspect of its self-sustainable goal by 2030. Projects by various private companies totaling 146MW are currently approved by the local government and under review. The locations of the current wind farms as well as the planned projects are shown in the map of

Figure II-1. As you can see in the map, most wind farms are located along the coast with a notable exception at Gasi-ri, which is located in the mid-mountainous areas. Korea's land area is limited so development has been focused on the coastal areas (Lewis, 2011).

<Figure II-1> Map of Jeju wind development projects (Lettered tags are currently operating, white tags are planned projects)



Source: Google Earth (2013)

<Table II-1> List of Jeju wind development projects: present and planned

	Location	Output	Completion Date	Operator	Other	
Currently Installed and Operating	Haengwon	10.55	2002	Jeju Energy Corporation		
	Sinchang	1.7	2006	Jeju Energy Corporation		
	Hankyeong Complex 1 & Complex 2	21	2004 & 2007	Korea Southern Power Company		
	Woljeong	1.5	2006	Korea Institute of Energy Research		
	Seongsan	20	2010	Korea Southern Power Company		
	Samdal	33	2009	Hansin Energy		
	Gimnyeong	1.5	2010	-		
	Wolryeong	2	2011	STX		
	Gasi-ri	15	2012	Jeju Provincial Government		
	Total:	106.25				
Approved and under Review		146	2013	SK, Hanhwa, POSCO, Doosan, Kimnyeong Cooperative, Korea Midland Power Co.	Planned for approval as of January 2013	
Planned Projects	Onshore	47.75	-	-		
	Total:	300	2015			
	Offshore		30	2013	POSCO, Doosan	
			150	2015	KEPCO	MoU with Jeju Government
			200	2017	Korea Southern Power Company, Samsung Heavy Industries	MoU with Jeju Government
			620	2020	Jeju Energy Corporation	
			300	2025	Jeju Energy Corporation	
			700	2030	Jeju Energy Corporation	
Total:	2,000	2030				

Source: Jeju Energy Corporation (2012)

Jeju Island is taking its new role as the leader in Korea's wind development seriously. The World Wind Energy Conference was held on the Jeju in 2009 helped to push development in the Asian region (Mostafaeipour, 2010). Jeju National University also promotes local development with its Test and Evaluation Center for Clean Energy Development.

Korea's wind industry is a relative newcomer in the world stage. Korea is well established domestic manufacturing sector is playing a key role. Due to Korea's lack of onshore wind sites, Korean conglomerates are exploring offshore wind potential. Many of Korea's largest industrial conglomerates have entered the wind industry and in less than ten years they are already manufacturing state-of-the-art turbines. Samsung, Hyundai, Daewoo, Doosan are some of the well-known international firms developing wind turbines. Doosan's first prototype offshore wind turbine was placed off the coast in Jeju Island in 2009. Samsung is also developing a 5 MW offshore turbine with plans to manufacture and export internationally two places such as the US and China. Due to Korea's small domestic market, the firms must focus on the international market (Lewis, 2011).

2. Attitudes and Perceptions

Countries that produce wind power tend to have strong overall public support. Studies repeatedly show general support levels towards wind power in general up to 90%. Nevertheless, the minority that does not support wind power can be loud, vocal, and successful. If there is such overall support, the question has been why then does the majority of wind power projects not seem to get off the ground? Researchers have focused on this 'social gap' and why wind power is met with fierce opposition (Krohn & Damborg, 1999; Bell et al, 2005).

An attitude is a mindset, or a tendency to act in a particular way due to both and individuals experience and temperament. Researchers use attitudes to try to explain people's behaviors. Attitudes define how we see situations as well as define how we behave toward

<Table II-2> A compilation of attitudes towards wind power from different sources

	Attitudes for	Attitudes against
(Simon, 1996) from (Krohn & Damborg 1999)	Renewable energy is very much an alternative to other energy sources The climate change theory must be taken seriously Wind energy is limitless unlike fossil fuels. Wind energy is non polluting Wind energy is safe	Renewable energy cannot solve our energy problems Wind turbines are unreliable and dependent on the wind Wind energy is expensive Wind turbines spoil the scenery Wind turbines are noisy
(Swofford 2010)	Allows land to be reverted to its natural state Allows multiple land uses Is a safe energy source Is a clean energy source Is a renewable energy source	Increases property values Causes TV interference Creates a disturbing noise from turbines Creates a strobe effect from turbine blades Requires too many number of turbines Is an unattractive feature of the landscape
(Wolsink 2000)		Noise pollution causing annoyance Spoiled scenery Interference with natural areas, particularly bird endangerment Unreliability of the energy supply The (supposed) expensiveness of wind as a source of energy
(Devine-Wright 2005)		Visual Impact (Size, Shape, Color, Landscape or Environmental Context)
(Graham 2009)	Attitude towards wind power in general National good/security of supply	Cumulative effects of neighboring projects Proximity to important features Perception of developer Economic effects (property values) Social impact Local impacts of construction Local environment

the situation or object. They are influenced by our social world and our social world influences the attitudes. They are a result of our learning, our modeling of others, and of our direct experiences with people and situations (Pickens, 2005).

Perceptions, very much related to attitudes are the process by which organisms interpret and organize sensation to produce a meaningful experience of the world. Perceptions are formed in a four-step process: stimulation, registration, organization, and finally interpretation. It's important to note that perceptions might not be the same as reality. Selective perception also occurs when an individual limits the process of certain external stimuli by selectively interpreting what he or she sees, based on beliefs experience and attitudes (Pickens, 2005).

Similar to Graham's (2005) study on attitudes towards wind farms, this study will use 'attitude' as referring to a negative or positive stance towards a wind farm or aspects of a wind farm. 'Perception' is used to refer to the person's views or observations about the wind farms.

There is a large amount of research to date on attitudes towards wind farms coming from Europe and the US. Table II-2 shows a compilation of these attitudes from different sources. The table is divided into attitudes for wind power, positive attitudes and attitudes against wind power, negative attitudes. It is interesting to note that many studies are focused on solely the negative attitudes rather than the positive attitudes. Many factors are repeated throughout the studies such as noise, impacts to the environment, and unreliability. This table is only a sampling of the numerous studies available. Other studies also commonly show the most heavily weighted negative attitude is the impacts of wind turbines on the landscape.

Positive attitudes towards wind energy in Table II-2 follow mainly on the socio-economic path. People who think renewable energy is safe, clean, limitless, and provides energy security commonly have positive attitudes. Also, people who believe climate change must be taken seriously and people who have positive attitudes towards wind power in general will have a generally positive attitude.

<Table II-3> A summary of factors identified in past research as affecting public perceptions of wind farms and renewable energy

Category	Aspect
Physical	Turbine color Turbine size Turbine acoustics Farm size and shape
Contextual	Proximity to turbines Landscape context
Political and Institutional	Energy policy support Political self-efficacy Institutional capacity Public participation and consultation
Socio-Economic	Shareholding
Social and communicative	Social influence processes (media, social networks, trust)
Symbolic and ideological	Representations of wind turbines
Local	Place and Identity Processes Local or community benefit and control NIMBYism
Personal	Previous experience and knowledge

Source: Devine-Wright (2005)

General attitudes of wind power in places have been found to develop along a U-shaped curve. Attitudes are generally high before a project is announced. Attitudes then turn negative during the development and construction phases, but return to their generally high levels after completion of the project (Wolsink, 2000). Krohn and Damborg (1999) succinctly said, “positive acceptance of wind power is largely based on public attitudes towards wind energy, while negative opposition of wind power is based on negative public attitudes towards wind turbines.

It might be more useful to look at factors affecting public perceptions of wind farms and renewable energy compiled into categories as in Table II-3. Devine–Wright (2005) described seven different categories of factors that affect people’s perceptions.

Researchers once exclusively and still sometimes use only the commonly cited and catchall NIMBY theory behind negative attitudes towards unwanted land uses to describe opposition to wind power. This is despite the fact that recent studies show that resistance towards wind power is complex and cannot simply be attributed to NIMBY alone. Other theories used include place attachment, the theory of social representations (Devine-Wright, 2005) and multi-dimensionalism (Brannstrom, 2011).

Since much of the research towards wind power has been through surveys of attitudes. Aitken in his (2010) study gives us some reminders to think about when we study attitudes towards wind power. Aitken states five key assumptions that are noted through the literature when discussing attitudes towards wind power that the researchers need to watch out for.

<Table II-4> Five assumptions of attitudes towards wind power

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

Source: Aitken (2010)

Each of these assumptions has some major flaws. The public support of wind power is not static, and in fact has shown overall declines in recent years. As was stated earlier, studies show that support for wind power can follow a U-shape, where support for wind power is initially strong, dips during the planning phase, and then regains support after completion of the project.

Aitken's other assumptions found in the literature include that because wind power continues to have such high support, the opposition is then categorized as 'deviant.' This view encourages researchers to consider opponents to wind power simply as something to overcome rather than to learn from them or incorporate their view. People who oppose wind farms might have good reasons for their opposition and it is the researcher's role to find the reasons and explain how both sides can benefit.

As the review progresses, different factors contributing to the public's attitudes towards wind will be analyzed. Wolsink (2000) identified factors that contribute towards people's attitudes about wind farms and towards their inclination to resist, their attitudes towards clean energy, their attitudes towards the environmental effects of wind turbines lead towards their attitudes towards wind power. A persons' attitude toward wind power, NIMBY, interference factors (birds, shadow flicker), and political efficacy all lead towards resistance to wind power. The next sections will look closely at these factors.

3. Clean Energy

One factor that influences people's perceptions towards wind power is their perception towards clean and green energy in general. The biggest factor driving wind energy development is the movement towards clean, green and renewable energy. As the world becomes increasingly aware of the effects of climate change, countries are taking action to reduce the effects of fossil fuels.

Wind energy has become the symbol of the green energy movement. Wind turbines among a grassy field with blue skies in the background can be found on advertisements, and magazine covers of anything promoting renewable energy. Pictures of peacefully rotating turbines in the breeze are clearly marketed producing the opposite feelings of large smokestacks spewing large amounts of pollution into a smoggy sky. Support for wind energy in general is unescapably linked to that of clean energy.

Opponents of wind energy often remark about the unreliability of the wind. The wind does not always blow. Wind power companies often provide statistics of the kilowatt (KW), megawatt (MW), and gigawatt (GW) production power of a turbine, but if the wind is not blowing, the turbine produces no electricity. In fact, a reasonable capacity factor of a wind farm is 20% (Lu et al, 2009). There is also nothing more harmful to the perceptions of wind power than that of a strong breeze blowing but a turbine standing still. Turbines require maintenance and the upkeep of a wind farm is highly visible and easily scrutinized. A local town that is being compensated for the use of their land for a wind farm that sees a turbine standing still only sees money that is being thrown away.

Szarka (2005) describes how policy development needs to focus in part on societal engagement to achieve social acceptance. He describes two categories for the motivation of social acceptance. The first are people who are driven by “green values.” As Figure II-2

<Figure II-2> Social acceptance of renewable energy innovation



Source: Wüstenhagen et al (2007)

shows, acceptance of technologies is an important aspect of socio-political acceptance. Following this model, in general, clean energies must be accepted first before the community and the market accept them.

Survey researchers often include questions about clean energy and find broad support. Theron et al. (2011) produced a study in Central Illinois on the public's beliefs and attitudes towards wind energy. They found that 82% of people in the community support wind energy. The people in the community believed that wind farms are good for the environment, jobs, and rural development. Finally, they found that the people believed wind energy's top attribute is the reduction of foreign oil dependence. Slattery et al (2012) suggest approaching wind energy from a perspective of a clean and safe source of energy is more persuasive than arguing for more renewable sources of energy based on reducing our carbon footprint.

4. Environmental Issues

As Pasqualetti (2004) elegantly states, "Like the gold rush of the 1850s, the modern wind rush started in California." The modern wind farm first appeared in the 1980s with the development of Altamont Pass outside of environmentally progressive San Francisco. The developers were expecting widespread acceptance but were surprised at the fierce resistance (Pasqualetti, 2004). The irony behind wind power, the environmentally friendly energy source, is that even though it started with lofty environmental goals to abate climate change, in many the origins of its resistance had environmental origins.

Throughout the literature, in other parts of the US and in many places in Europe, opposition towards wind energy trends towards an environmental standpoint. The complaints developers face about wind energy include such factors as noise, damage to wildlife, and damage to scenery. These complaints lead to negative perceptions of wind power development.

The environmental effects are found in many studies to affect resident's opinions more than other factors. Visual impact is a major factor in the reaction of the public to the development of new wind farms (Molnarova, 2012). Perceived unity of the environment and personal attitude toward the effects of wind turbines on landscape aesthetics and recreation caused intentions to oppose according to Johansson and Laike (2007). On the other hand, Warren and McFaydyen (2010) found that visual impact is one of the most significant concerns but majorities regard wind turbines visual impact as positive.

The environmental conflict is an interesting conflict because the environmental benefits of wind energy are the reasons given for its implementation over fossil fuels yet it's other environmental negatives that cause the conflict. Warren et al (2005) call this unique conflict the "green on green" conflict that puts environmentalists against environmentalists.

Public perceptions about wind turbines killing birds also persist. Damage to birds, animals, and wildlife are a commonly cited problem by environmental groups opposed to wind power. The fierce resistance came after the experience of California's first large-scale wind farms in Altamont Pass mentioned earlier (Pasqualetti, 2004). Hundreds of birds were killed including 39 golden eagles per year. Pasqualetti lists many resources that show that Altamont might have been the exception rather than the rule and that although it is true that wind farms can hurt bird populations, the damage can be greatly exaggerated. Mortality rates should be kept into perspective, especially when compared to everyday common thing such as glass windows, house cats, automobiles and airplanes.

Johansson and Laike (2007) performed a study on the importance of visual perception and attitudinal factors in public intention to oppose wind farms. They found that if the turbines didn't fit in with the landscape, the residents were more likely to oppose. On the other hand, if the residents showed positive attitudes to the environment or wind turbines, these attitudes should be strengthened.

Perhaps wind energy's biggest advantage over other forms of renewable energy is its relative lack of an environmental footprint. The amount actual ground that a wind turbine takes up is in reality very small. Access roads need to be built and a power station nearby, but the remaining ground can be preserved for multiple land uses. Farmers can lose very little land and reap the economic benefits.

5. NIMBY

NIMBY (Not-In-My-Back-Yard) is the catchall phrase that is the commonly stated argument for opposition to locally unwanted land uses. NIMBY has not only been an argument for many forms of public projects ranging from energy production facilities including nuclear and coal to other public facilities including hospitals and nursing homes (Wolsink, 2000).

NIMBY provides a simple explanation to opposition: those opposed to the siting of a particular facility have a "strong aversion to living next to that kind of facility being proposed and are predisposed to reject it." It is a result of a high amount of fear regarding the risks and uncertainty about a facility that leads to opposition (Armour, 1991).

Indeed, studies show that in regards to existing noxious facilities, the closer the people live to a facility, the more likely they are to be concerned. Furuseth and Johnson (1988) performed a survey around a publicly owned landfill facility in Charlotte, North Carolina. They found that the majority of people living near the facility had no problems, but for those who had concerns, "there was a definite relationship between the degree of concern and distance from the facility."

In the media and common parlance NIMBY is commonly used as a pejorative, with a negative connotation, to describe opposition. In recent times, wind development opposition particularly takes a large brunt of this abuse. People who are opposed to wind farms will be

negatively labeled “NIMBYs” and their views are looked down upon as selfish and shortsighted (McCaffery, 2011).

Recent studies however have reduced NIMBY to only one part of the explanation to opposition to locally unwanted land uses. Devine-Wright (2005) notes that the research up to this point merely describes opposition to wind power rather than explains the opposition. He also contends for lack of empirical support for the NIMBY concept. Empirical studies in different regions come up with inconsistent findings, particularly in terms of the proximity hypothesis that opposition to wind power increases as you measure closer to the turbines. Devine-Wright’s study shows how many different factors there are to describe opposition to wind power. He shows how each ‘independent variable’ affects how wind turbines are perceived and that the existence of such complexity shows the inadequacies of NIMBY explanations.

Swofford (2010) studied NIMBY effects in Texas. His study is an example of a study that found that although landowners in Texas situated closest to wind turbines were least favorable towards them, they still indicated an overall positive attitude. Swofford regarded those who did not support the turbines were too small of a minority to indicate NIMBY-like behavior. The NIMBY theory taken literally should show an overall opposition by people within close proximity of the turbines whereas Swofford’s study only showed a small opposition.

Many other acronyms have come out of the NIMBY name. NIABY (not-in-anyone’s-backyard) is the situation where people will totally oppose any project whether the project is close to them or far. This situation represents total opposition to the project. Sowers (2006) notes that “NIMBY is quickly becoming NIABY (Not In Anyone’s Backyard). The sophistication of opposition groups, particularly on the west and eastern

coasts of the US has grown such that no matter what developers do, there is no chance for compromise.”

YIMBY (yes-in-many-backyards) is the situation where people have no problem agreeing with having a proposed project sited in close proximity to their house or near any other house. YIMBY people will generally see the public utility in the project and accept the burdens on behalf of the public good. YIMBY originated in distribution of hazardous waste management in Southern California in the 1980s. The YIMBY philosophy requires that everyone take responsibility for his or her fair share of the waste problem. It involves scaling down, decentralization and diversity to supply needed, but hard-to-site public infrastructure (DiMento et al, 2011).

PIMBY (Please-in-my-backyard) is the developer’s dream where the local residents not only want a planned project to be in their neighborhood, but they might even fight to get a project to be sited in their area rather than another area. PIMBY situations might happen when economic incentives are involved that help the community or individual. Swofford (2010) in his study believes that his findings show that most respondents support wind farms while a small minority, only 13.8%, oppose wind farms, which he claims suggests more of a PIMBY effect. Sowers (2006) also notes despite his NIABY findings, numerous instances in the Great Plains states where local reaction is positive and reflects that of PIMBY.

Research has found instances of PIMBY even in fiercely protective areas such as the UK. In a detailed study on spatial, temporal, and NIMBY effects on attitudes towards wind farms, Warren et al (2005) found what they termed an “inverse NIMBY” phenomenon. The closer you get to the wind farm, the higher the support level. They determined that this support level was due to the economic benefits.

The variables going into wind power and renewables are different than that of other noxious facilities. The argument for siting nuclear power stations is much more two-sided

than wind energy. There are much fewer local benefits and much more damaging effects that can occur to local residents when a noxious facility is sited near their home. A new nuclear power plant can provide much more negative effects and there will be more people who don't want nuclear at all near them. Wind power on the other hand can provide much more benefits than any of these other commonly cited facilities.

NIMBY, however, is still included as a theory in current studies and sometimes shows relevance. Toke (2005) found that the attitude of the half dozen or so people who live closest to the proposed wind farm do have a major influence on the planning outcome at the local authority level. He also found that opposition to wind farms is only sustainable when there is a local feeling to maintain it. National campaigns only have an influence on the national political environment rather than having a direct impact on local planning.

Despite the persuasiveness of the NIMBY perspective, there are some reasons to question it. First, in a survey, it's questionable whether people will actually respond to a real situation the way they might in a hypothetical one. Also, NIMBY reflects a limited analysis of conflict. Conflict involves the interrelated aspects of attitudes, behavior, and incompatible goals and values of the parties involved. All aspects of the conflict must be assessed. Finally, the NIMBY perspective labels only one party, the opposing residents. It puts all the 'blame' on the public and leaves out the significance of the roles of the other key actors in fostering conflict (Armour, 1991).

Recently, researchers are attempting to find other ways to describe local opposition to wind turbines. One such proposed theory by Devine-Wright (2005) is that local opposition is a form of place-protective action. Using a social constructivist perspective and social representation theory, change of place is described through the stages of becoming aware, interpreting, evaluating, coping, and acting (Devine Wright 2009).

6. Community benefits

Economic issues are another major category that can either contribute negative or positive attitudes towards wind energy. Impact on property values, the unreliability of the energy supply, the (supposed) expensiveness of wind energy, and the perceptions of the developers are reasons cited for negative attitudes. It's interesting to note that many of the economic issues that affect attitudes towards wind turbines deal with perceptions of possible consequences that might or might not come to fruition. The perceived expensiveness of wind energy and perceptions of the developers may have little to do with facts, but nevertheless plays a role in negative attitudes. On the other hand, the PIMBY situation, described earlier shows that economic issues can turn into positives for both developers and local residents.

Wind power has taken off worldwide due to economic incentives provided by the governments of developed countries. The US extended its wind production tax credits through 2013. In 2012, South Korea replaced its feed-in tariff with a renewable portfolio standard. There is money to be made in the wind energy industry.

To attract communities, the developers have learned to share the profits and areas in need of development come begging for the money to come in. This situation is where the PIMBY (Please-In-My-Backyard). The farmers on whose land the developers built on might get a percentage of the returns. Developers stress the tax benefits that the communities receive. The developer might provide other incentives such as new roads or schools. The developers also emphasize the jobs that will be created and the money that will flow into the community when the turbines are being built. Someone needs to be in the area to maintain the turbines.

Sowers (2006) conducted interviews in the US Great Plains, which are well known for their wind power potential. In his interviews with farmers in Iowa with wind turbines on their land, the check that comes in the mail more than offsets any inconveniences created by the turbines. One landowner said, "I have not heard anyone complain who wasn't getting

paid.” The neighbors on the other hand get the costs but none of the benefits. Surprisingly none complain. One farmer says, “We think they are good for the farmer community.” Another says, “Every day that these turbines can buy for this community is worth whatever they look like, and whoever said the place has to look pretty anyway? Go up to three-hundred-pound hog covered in [manure] and tell me if you think that it’s beautiful. It is one of the ugliest things on Earth but to me it’s a beautiful sight, because it allows me to live in this nice house, in this nice community.”

Toke (2005) found that in England, “the failure to ensure wider local ownership or perceived disbursement of significant local economic benefits must be viewed as a major shortcoming in developer strategies.” Numerous other studies mention and recommend not only community benefits but community ownership as well. Warren and McFaydyen (2010) recommend changing the development model towards community ownership. Maruyama (2007) mentions that the principal actors in the community Wind power projects are complex but share various economic interests and a “sense of social commitment, participation, and contribution.”

Benefits can take the form of direct financial payments. For example, wind energy in Illinois can create up to \$1 million per year in local property taxes in addition to \$4000-\$5000 per megawatt for the land owners (Theron et al, 2011). Benefits that cause people to demand development on their land are not limited to direct financial incentives. People tend to site additional land uses as a benefit, as well as the ability for the land to revert to its natural state (Swofford, 2010).

7. Public Participation

A common explanation for siting disputes is poor public relations on the part of facility proponents. Armour (1991) says that the problem is more than simply an image

problem. The way proponents act and deal with residents' concerns is a major factor in the success or failure of a planned project.

Armour goes on to detail six broad public relations errors that tend to be made in siting planned projects.

Local participation in the planning process is a crucial factor in getting wind projects accepted and education is another way of getting the public involved to avoid unnecessary conflicts and opposition (Swofford, 2010). Participation in the siting process is not the only

<Table II-5> Six public relations errors in siting planned projects

It's our agenda:	The proponents over-emphasize their own point of view, leaving the community's alternative perspectives behind
It's the big picture that counts:	Too much emphasis on policy and not enough perspective on the local citizens.
Going public too late:	Perhaps the most common, early public consultation ensures that unique local concerns and issues are met.
Bunker mentality:	Proponents when attacked tend to restrict the amount of information available, when transparency is crucial to alleviate conflict.
Poor format/ poor form:	Reliance on public meetings and open house methods are not effective when proponents don't possess the skills to effectively conduct these kinds of meetings.
Leave it to the hearing:	Proponents tend to rely on lawyers as a means of resolving issues. This restricts the flow of information.

Source: Armour (1991)

way the public can be involved. Great deals of success have been attributed to public ownership of wind turbines.

Christensen and Lund (1998) explain that the likely reason wind is accepted in Denmark is due to the government rules of local ownership and partnership in wind turbines.

At the time of their research, 48% of turbines were locally owned in partnerships of 40-50 families.

On the other hand, Cowell (2011) questions the role in community benefits in wind farm siting decisions. The conventional view is that increasing the flow of community benefits increases the social acceptability of the facilities. They found that the significance of the benefits to the community changes whether or not the community has control and influence over the project. The payments to a community play an important role in the siting process, but they are not a determinant of the decision to proceed. They argue that the rationale of expediting consent of these community benefits obscures other justifications such as the role of these benefits in promoting environmental justice and how they might improve the long-term sustainability of the area.

In addition to poor public participation, flawed siting processes can also contribute to conflicts (Armour, 1991). Not only do we need to work on our understanding of opposition to siting, studies also show that more communication and deliberation by decision makers, experts and stakeholders is needed (Owens and Driffell, 2008). Haggett (2011) recommends that the public should be provided with a key role in decision making about offshore wind projects. Jones and Eiser (2009) found in their study that NIMBY was a factor, but instead uncertainty regarding proposals. They, as well as other studies (Jobert et al, 2007) recommend early, continued and responsive community involvement and they recommend the developers need to know how to manage social acceptance. The second part of Szarka's (2005) call for policy development to focus on societal engagement to achieve social acceptance is a "rent-seeking" behavior driven by ownership. Szarka emphasizes the need for enhancing community participation stakeholder involvement.

III. APPROACH AND METHODS

1. Survey Approach

1) The survey

To meet the objectives of this research, a quantitative approach was utilized. A questionnaire survey was distributed that highlights dimensions of support or opposition towards wind farms on Jeju Island.

The questionnaire survey focused on comparing the support, opposition, and perceptions of wind power among foreign residents and Korean residents. The questions were chosen and categorized based on the research of Wolsink (2000) and Devine Wright (2005). Twenty-three questions about perceptions focus on the following topics:

- General Support for Wind Power
- Clean (Green) Energy
- Environmental issues
- Economics and Community Benefits
- NIMBY
- Knowledge

The survey was written in English and translated into Korean before distribution. The cover letter gave a brief introduction describing the purpose of the survey as a comparison of attitudes of local and foreign residents. The cover letter then gave a brief description of the current state and plans of Jeju's wind energy projects. After the twenty-three survey questions, the survey contained six demographic questions asking gender, age, education, income, employment, and location in Jeju.

The English language version, to be distributed to the foreign residents, contained two additional demographic questions. The first additional question asked the foreign residents how many years they've lived in Jeju. This is an important demographic that can show how deep of an attachment the respondent has to Jeju. It is reasonable to assume that most respondents of the Korean language survey are long time residents of Jeju so this question was not asked in the Korean language survey.

The second additional question asked whether the respondent was a foreign resident or Korean resident. This was placed to prevent a local Korean resident from answering the English survey. Since all respondents of the Korean survey answered an earlier demographic question about where they live, it is reasonable to assume that the people answering the Korean surveys were Jeju residents.

In total, the Korean version of the survey to be distributed to the local residents contained twenty-nine (29) questions in total and the survey distributed to the foreign residents contained thirty-one questions (31) in total.

2) The number of the sample

The questionnaire survey was distributed during October of 2013. In total, 109 local residents and 101 foreign residents were selected to take the survey. The total sample size was 210 people ($n = 210$). A large number was chosen due to the difficulty of obtaining a truly random sample.

3) The recruitment of the sample

The local residents were selected from all parts of Jeju Island. Rural and urban residents were included. Jeju Island is divided into four administrative zones, Jeju City, Jeju (northern) rural areas, Seogwipo City, and Seogwipo (southern) rural areas. Students from the Jeju National University College of Social Science were given copies of the Korean

survey and instructed to distribute the survey to the local residents in their hometowns. Students were carefully and randomly selected according to their location to ensure an even distribution. The survey for the foreign residents was provided both online and on paper. The paper surveys were distributed at two different sporting events, in which both foreigners and Koreans participated. The online surveys were sent through email. As the survey for the foreign residents was written in English, only residents who have full command of the English language were selected. All samples chosen were assumed to have some knowledge or experience with wind power.

2. Assumptions about the Hypothesis

It will be assumed that the distribution of the survey will produce a random sample. A large sample $n > 100$ was acquired, so due to the Central Limit Theorem, approximate normality of the sampling distribution of the sample means is assumed and so the “*t*-test statistic” will be used.

3. Independent Variables:

1) Local Residents

The distributors were instructed to give the survey to local residents, Korean residents of Jeju Island. Although there were no questions on the survey to check how long the respondents have lived in Jeju it is reasonable to assume that the majority of survey respondents have lived in Jeju for their entire lives.

2) Foreign Residents

The distributors were instructed to give the survey to the foreign residents of Jeju Island Korea. Foreign residents are people who have come to Jeju to live, work, or study for

an extended period of time, usually at least one year or more. It is reasonable to assume that the foreign residents have a reasonable amount of interest in Jeju Island that they have chosen to reside away from their home country.

4. Hypothesis

As stated before, the purpose of this study is to (1) investigate the local and foreign attitudes and perceptions towards wind power on Jeju Island and (2) compare the opinions of the local residents and the foreign residents to see if there is any difference.

The perceptions of the foreign residents can provide a unique insight into the discussion of conflicts on wind power. Korea is a newcomer to the development of wind power, and Jeju Island is the first place in Korea to provide wind power. They will provide their perspectives from their home country's experience that the local residents might not have had. The foreign residents included in this study have enough interest to spend a year or more of their lives living on the island. Their interest in the island might focus around different perspectives than that of the local people. A comparison between the two groups can highlight the concerns of the Jeju Island people.

Research Question 1:

Do foreign residents have a different attitude towards the support of wind farms and wind power than local residents on Jeju in general?

Research Question 2:

In which factors, clean energy, environmental, socio-economic, NIMBY, and knowledge factors of wind power do foreign residents and local residents differ?

Research Question 3:

How do these factors compare with what the literature says about the public's perceptions towards wind farms?

5. Testing the Hypotheses

The results from the survey provided data from two different groups, local residents and foreign residents. Thus, the data is analyzed using bivariate statistical methods using SPSS. The same survey was distributed to both the local residents and to the foreign residents, thus this study is a cross-sectional study. Means of the local, Korean residents (M_l) are compared with the means of the foreign residents (M_f) using the independent samples t -test. Null and alternative hypotheses about the parameter will always take the two-tailed form:

H_0 : The attitudes towards wind farms are the same between local residents and foreign residents in Jeju. ($\mu_l = \mu_f$)

H_A : The attitudes towards wind farms are not the same between local residents and foreign residents in Jeju. ($\mu_l \neq \mu_f$)

The t -statistic will be used to describe how far the point estimate falls from the H_0 : value. It will measure the number of standard errors that the point estimate (y) falls from the H_0 : value.

$$t = \frac{\bar{y}_l - \bar{y}_f}{se} \quad \text{where} \quad se = \sqrt{\frac{s_l^2}{n_l} + \frac{s_f^2}{n_f}}$$

The weight of the evidence will be described using the p-value. The p-value will be calculated by presuming that H_0 is true. The p-value will be reported and interpreted. Conclusions will be made based on the sample evidence about H_0 . The fixed α - level will be $\alpha = 0.05$. If the p-value is less than or equal to $\alpha = 0.05$ then H_0 will be rejected.

IV. EMPIRICAL RESULTS

1. Introduction

In total, 210 surveys were collected. From the foreign resident population, 101 surveys were returned and from the local Korean resident population, 109 surveys were returned. To minimize statistical error, the distribution method ensured that a total of 210 surveys were returned ($n = 210$). Of the total, both groups Korean and foreigners, were evenly represented. 110 surveys (52%) came from the local Korean community and 101 surveys (48%) were from the foreign community. All surveys were mostly completed and although some surveys had omissions in certain questions, all surveys were used in the statistical analysis.

2. Demographics

There were six demographic questions at the end of the Korean survey. In the English survey, there were two extra demographic questions bringing the total to eight. The demographic distribution is reported in table IV-1.

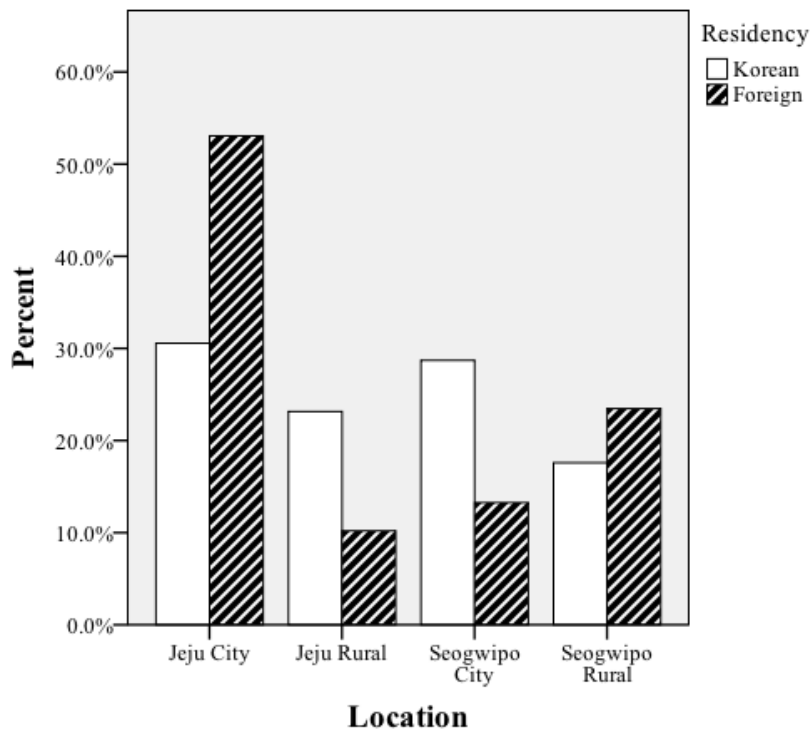
A total of 109 surveys were collected from the Korean resident population and 101 surveys were collected from the foreign resident population, making a total of 210 surveys collected. One foreign resident survey was returned with no demographics marked, but the survey was still used in the study. As a result, the totals on table IV-1 show the foreign total as 100 instead of 101.

The survey was distributed with three specific demographics in mind to control for. For the study, an even distribution in of the location of respondents was the most important, followed by gender and age. Questions about education, income, and employment were also included to give a more complete description of the respondents. The foreign resident

demographics were difficult to control. Since the overall foreign resident population in Jeju is only 12,656 (Jeju Weekly, 2013) as of the beginning of 2013, a wide range of demographics is difficult to obtain. The local population was easier to control due to the size of the population (600,000) in Jeju.

Jeju is divided administratively into two city regions, and two rural regions. Jeju City is located in the north and Seogwipo City is located in the south. The rural regions are divided by a longitudinal line that divides in half with Jeju rural areas in the north and Seogwipo rural areas in the south. Since proximity to wind farms is an important factor in this study, a relatively even distribution of location was strived for and came out rather well in the Korean sample. Figure IV-1 shows that Jeju City provided 33 surveys (31%), Jeju rural areas provided 25 surveys (23%), Seogwipo City provided 31 surveys (29%) and Seogwipo rural areas provided 19 surveys (18%). In the foreign sample, as most foreign residents on Jeju live in Jeju City, the distribution turned out as expected with Jeju city

<Figure IV-1> Location of respondents



<Table IV-1> Demographic Statistics

	Frequency (n)		Percent			Frequency		Percent (%)	
	Korean	Foreign	Korean	Foreign		Korean	Foreign	Korean	Foreign
Gender					Employment				
Male	57	57	52	57	Public Official	9	40	8	41
Female	52	43	48	43	Professional	13	49	12	50
Total	109	100	100	100	Manuf, retail, service	29	1	27	1
Age					Farming and ag	11	0	10	0
19 - 29	34	49	31	49	Other	46	8	43	8
30 - 39	26	43	24	43	Total	108	98	100	100
40 - 49	22	6	20	6	Location				
50 - 59	24	0	22	0	Jeju City	33	52	31	53
> 60	3	2	3	2	Jeju Rural	25	10	23	10
Total	109	100	100	100	Seogwipo City	31	13	29	13
Education					Seogwipo Rural	19	23	18	23
Less than HS	4	0	4	0	Total	108	98	100	100
HS diploma	32	2	29	2	Years in Jeju^a				
University	73	97	67	98	< 1	-	32	-	33
Total	109	99	100	100	1 - 2	-	22	-	22
Income					3 - 4	-	22	-	22
< 19.9m	31	7	30	7	> 5	-	22	-	22
20 - 29m	25	41	24	42	Total	-	98	-	100
30 - 39m	25	19	24	19					
40 - 49m	13	14	12	14					
50 - 59m	11	7	10	7					
> 60m	0	10	0	10					
Total	105	97	100	100					

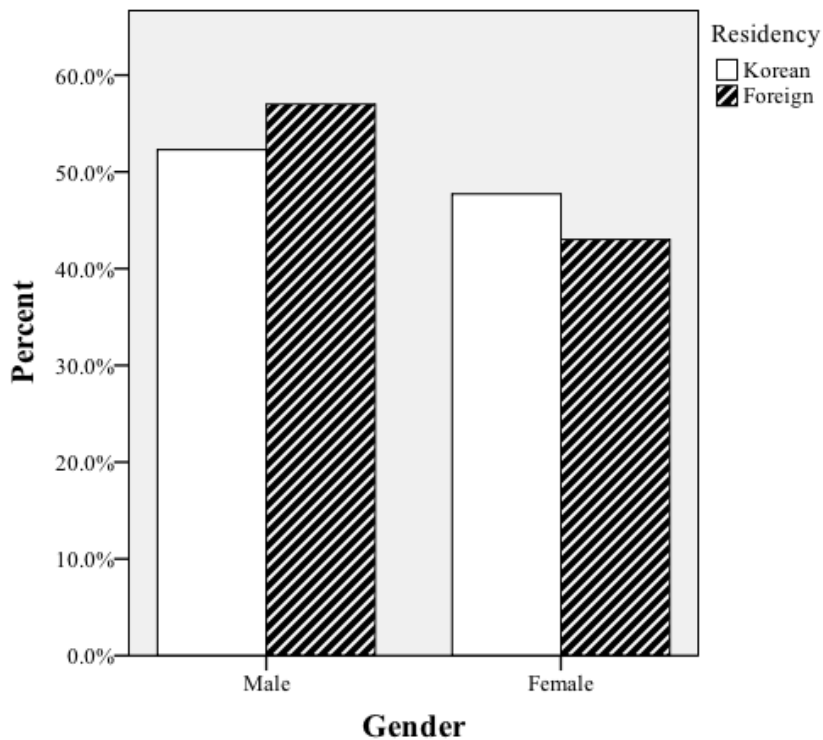
Note: One survey was returned with no demographics marked, but the survey was still used in the study.

^aJeju residents are assumed have been born in Jeju and thus were not asked this question

providing 52 surveys (52%), Jeju rural areas 10 surveys (10%), Seogwipo City 13 surveys (13%) and Seogwipo rural areas bringing 23 surveys (23%) with two missing.

Figure IV-2 shows that gender in the local resident population distributed well with 57 males (52%) and 52 females (48%). Age was also well distributed with in the local resident population with 19-29 year olds bringing 34 surveys (31%), 30-39 year olds bringing 26 surveys (24%), 40-49 year olds bringing 22 surveys (20%) and those over 50 bringing 27

<Figure IV-2> Gender of respondents



surveys (25%). In the foreign resident population, gender was relatively evenly distributed with 57 males (57%) and 43 females (43%).

Unfortunately, the foreign sample represents a younger group with 19-29 year olds bringing 49 surveys (49%), 30-39 year olds bringing 43 surveys (43%), and those over 40 years old brought 7 surveys (7%). Although this sample does not match up well, this younger

sample is likely representative of the foreign resident population of Jeju. There are very few from the older generations living in Jeju.

The rest of the demographic variables came down to the luck of what the respondents brought and it paints an interesting picture. In terms of income, the average selection for income coming from the Jeju residents is much more diverse than the foreign residents. The foreign residents selected higher ($M_l = 2.5$, $M_f = 3.03$)

While many of the local population (29%) has only a high school diploma, nearly all (98%) of the foreign population has some university or higher. The local population is more evenly distributed than the foreign population in terms of employment with most Koreans working in manufacturing, retail, and service jobs (28%). The foreign residents heavily represent the public sector (41%) and the private sector (50%), or they are students (8%). In contrast, only a total of 20% of the Korean sample works in the public and private sectors combined.

The biggest difference between the foreign and local demographics is in employment. Most of the English speaking foreign residents who live in Korea come to reside in Korea due to the huge demand for English teaching jobs in the public schools or private academies. Hence there is a high frequency of young foreign residents with a similar income. These jobs show up on the questionnaire as people working either as a public official or professional. This weakness in the survey was expected.

The foreign resident population was asked an additional question about how many years they've lived in Jeju with a distribution of 32% living in Jeju less than 1 year, 22% living in Jeju 1-2 years, 22% living in Jeju 3-4 years, and 22% living in Jeju more than 5 years. As was stated earlier, it is reasonable to assume that the respondents of the Korean survey are Jeju residents, so the question was omitted from their survey.

3. Results

1) General Support

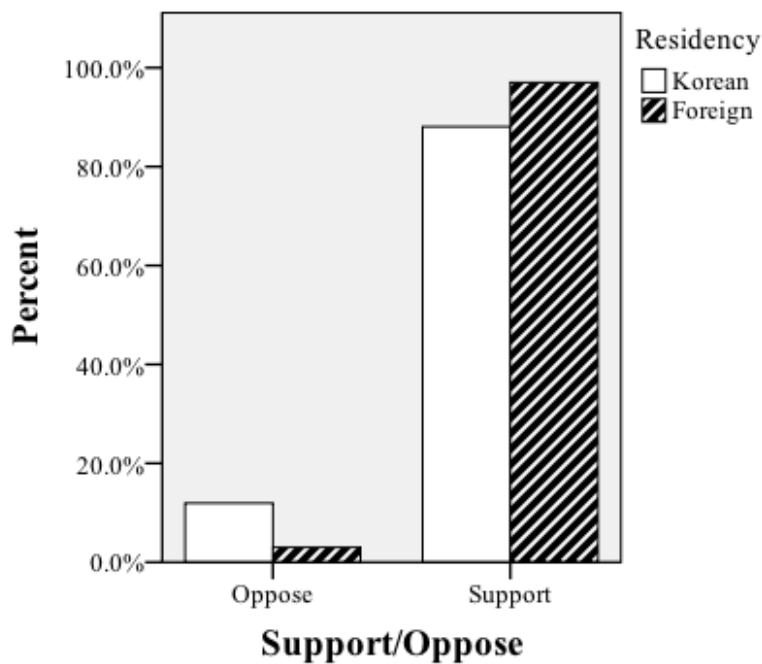
The first question asked whether the respondent generally supports or opposes wind energy in Jeju. The vast majority of both groups support the development of wind power in Jeju. Table IV-2 shows the results of the survey and comparison. There was a significant difference in support for wind power among foreign residents ($M_f = 1.97$, $SD = .171$) and local Korean residents ($M_l = 1.88$, $SD = .171$); $t(207) = -2.448$, $p < .05$. These results show

<Table IV-2> Comparison results of general support

Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
General Support	1.88	.326	1.97	.171	-2.448	207	.015

Notes: 1 = Oppose, 2 = Support

<Figure IV-3> Support or opposition of wind power in Jeju



much stronger support for wind power among the foreign residents and more opposition from the local Korean residents. In fact, the foreign residents show near unanimous support for wind energy (97%) while the local residents show more opposition (12%) as can be seen in figure IV-3.

These results agree with the hypothesis that there is a significant difference in support between both groups in regards to wind power. The results also agree with the hypothesis that the local residents will show more opposition towards wind power than the foreign residents. The literature also shows that wind power in general tends to lend itself to large general support. Although the local Korean residents show more opposition than the foreign residents, their level of support is still quite large (88%). This high level of support by the local Korean residents matches the large general support shown in the literature.

2) Clean Energy

<Table IV-3> Comparison results of perceptions towards clean energy

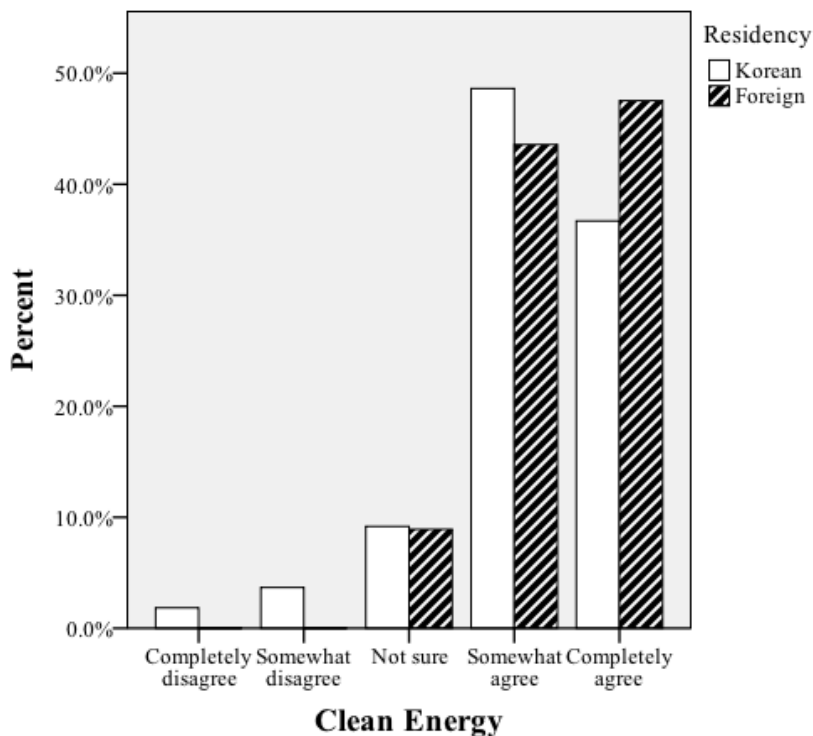
Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Wind farms produce clean energy	4.15	.870	4.39	.648	-2.248	208	.026
Wind power is a reliable source of energy	3.89	.956	4.15	.792	-2.125	208	.035
We should use more wind energy to fulfill Jeju's energy demands	3.83	.977	4.50	.716	-5.634	208	.000
Note: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Not sure, 4 = Somewhat agree, 5 = Strongly agree							

The next set of questions deal with whether or not the respondents believe in the value of having clean or green energy. A person's views on clean and green energy tends to affect their views towards wind power. The literature has shown that a person who has a more

positive perception towards clean energy will in turn have a more positive attitude towards wind power. Table IV-3 presents the results of the comparison of the two groups in regards to clean energy.

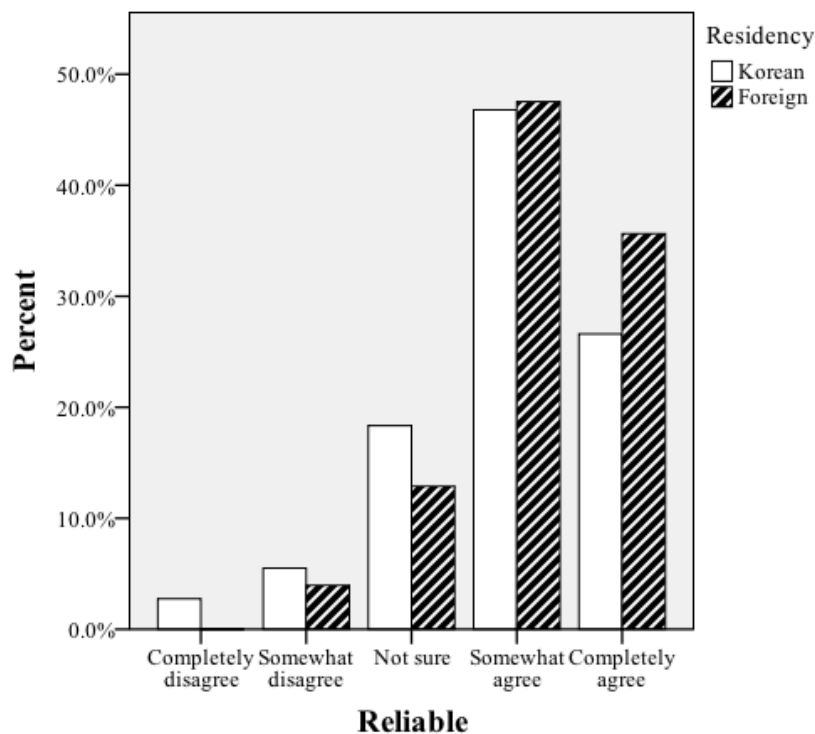
The first question in this section asks whether the respondent agrees or disagrees that wind farms produce clean energy. There was a significant difference in support for wind power among foreign residents ($M_f = 4.39$, $SD = .648$) and local Korean residents ($M_l = 4.15$, $SD = .870$); $t(208) = -2.248$, $p = .026$. These results show stronger belief in the clean energy attributes of wind power among the foreign residents. Interesting to note is that none (0%) of the foreign respondents either somewhat disagreed or completely disagreed that wind energy produces clean energy as can be seen in figure IV-4. Within the local Korean residents, 4% disagreed and roughly 9% from each, the foreign and the local group, said they were unsure. This shows very large acceptance of both groups of the clean energy aspects of wind power.

<Figure IV-4> Do you agree or disagree that wind farms produce clean energy?



The second question asks whether the respondent agrees or disagrees that wind power is a reliable source of energy. A common perception is that because the wind is not constant, wind power is an unreliable source of energy. If wind power is perceived to be an unreliable source of energy, it is reasonable to assume that the person will have a negative attitude towards wind power. There was a significant difference in support for wind power among foreign residents ($M_f = 4.15$, $SD = .792$) and local Korean residents ($M_l = 3.89$, $SD = .956$);

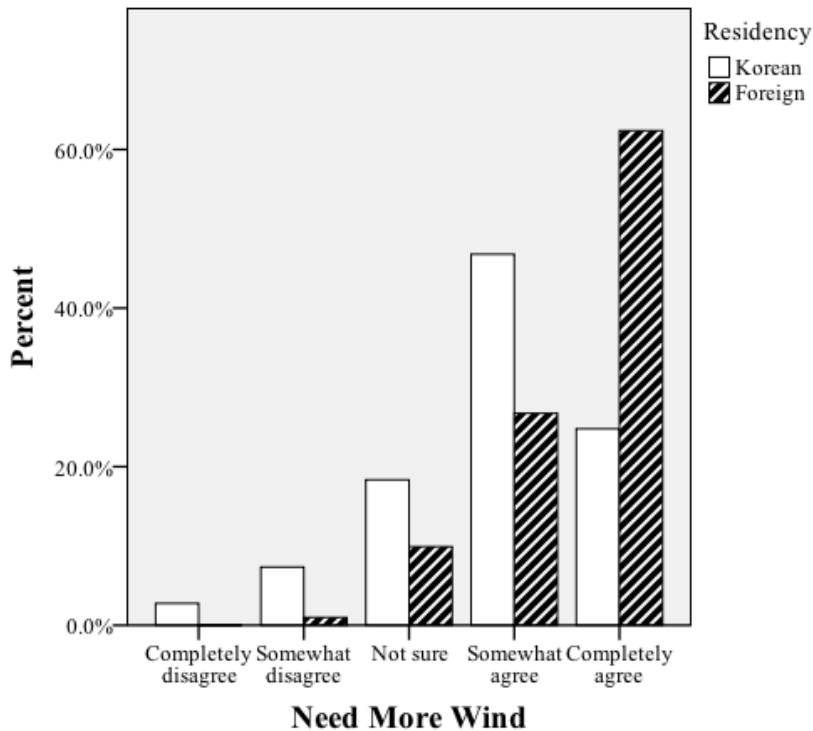
<Figure IV-5> Do you agree or disagree that wind power is a reliable source of energy?



$t(208) = -2.125$, $p = .035$. These results show the foreign group more strongly agreeing that wind is a reliable source of energy than the local group. Figure IV-5 shows that none of the foreign residents believe that wind power is completely unreliable while a small percentage (7%) of the local Korean residents believe that wind power is unreliable.

The third question in the clean energy section asks whether the respondent agrees or disagrees that Jeju should use more wind energy to fulfill Jeju's energy demands. There was

<Figure IV-6> Do you agree or disagree that we should use more wind energy to fulfill Jeju's energy demands?



a highly significant difference in support for using more wind energy among foreign residents ($M_f = 4.50, SD = .716$) and local residents ($M_l = 3.83, SD = .977$); $t(208) = -5.634, p < .001$. It is very interesting that up to 90% of the foreign group completely or somewhat agrees that Jeju should use more wind, while only 71% of the local group completely or somewhat agrees as can be seen in figure IV-6. Much more of the local group (28%) leans towards not sure or disagreeing. These results suggest grounds for the doubts toward wind power among the local people of Jeju.

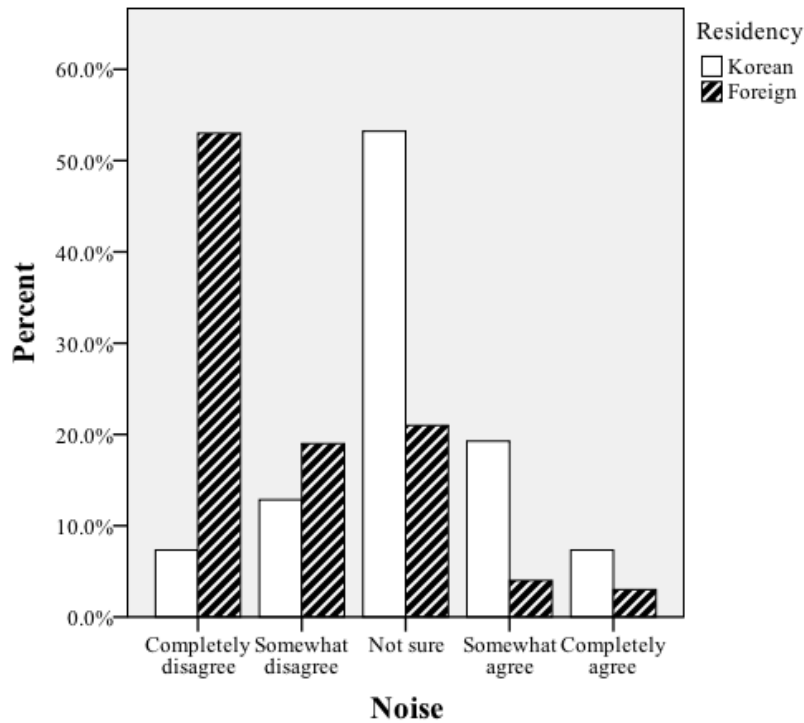
As the literature states, if a group has a more positive perception towards clean energy, they are more likely to support wind power. This holds true with both groups, as both have a generally positive view in regards to the three clean energy questions. Also, the fact that the foreign residents have a much stronger perception than the local residents coincides with the foreign resident's stronger general support.

<Table IV-4> Comparison results of perceptions towards environment

Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
The noise from wind farms disturbs your daily life	3.06	.955	1.85	1.077	8.638	207	.000
Wind farms disturb birds, animals, and their natural habitats	3.35	.917	3.07	1.116	1.988	208	.048
Wind farms damage areas of scenic beauty	2.93	1.060	2.67	1.234	1.599	208	.111

Note: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Not sure, 4 = Somewhat agree, 5 = Strongly agree

<Figure IV-7> Do you agree or disagree that the noise from wind farm disturbs your daily life?



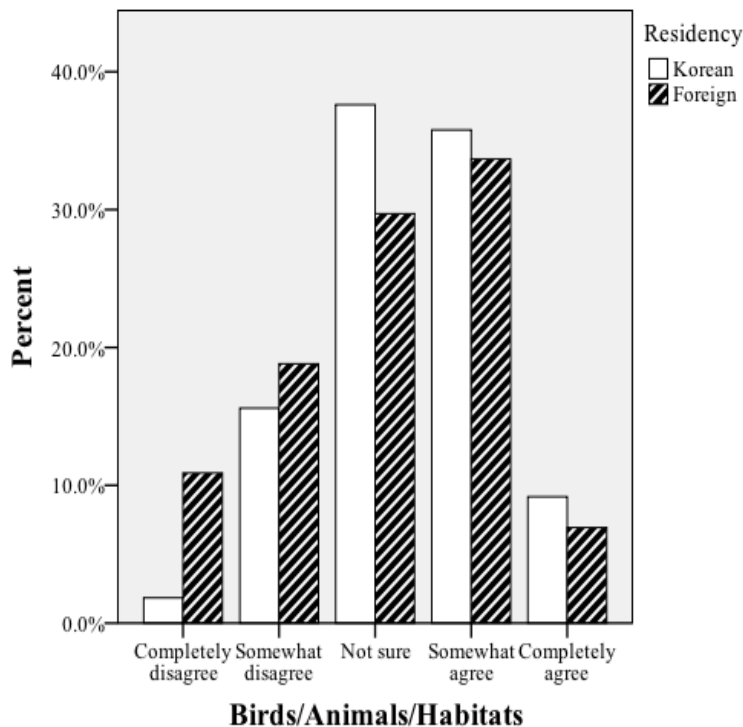
3) Environmental

The next set of questions deal with resident’s perceptions of how wind farms relate to the environment. The review of the literature showed that although the push for wind power

is rooted in climate change, wind turbines get resistance for the sake of the environment. Table IV-4 shows the results of the comparison of perceptions towards the environment.

The first question asks whether the respondent agrees or disagrees that the noise from wind farms disturbs their daily lives. There was a highly statistically significant difference in perceptions of the noise coming from wind farms among foreign residents ($M_f = 1.85$, $SD = 1.077$) and local residents ($M_l = 3.06$, $SD = .955$); $t(207) = 8.638$, $p < .001$. These results show that foreign residents much more strongly disagree that noise from wind farms disturbs their daily lives than local residents. The local group is much more evenly distributed than the foreign group. Among the foreign group, 72% highly lean towards somewhat disagreeing or strongly disagreeing while among the local group, 20% completely or somewhat disagree. Note that disagreeing that wind farms noise from wind farms disturbing ones daily life

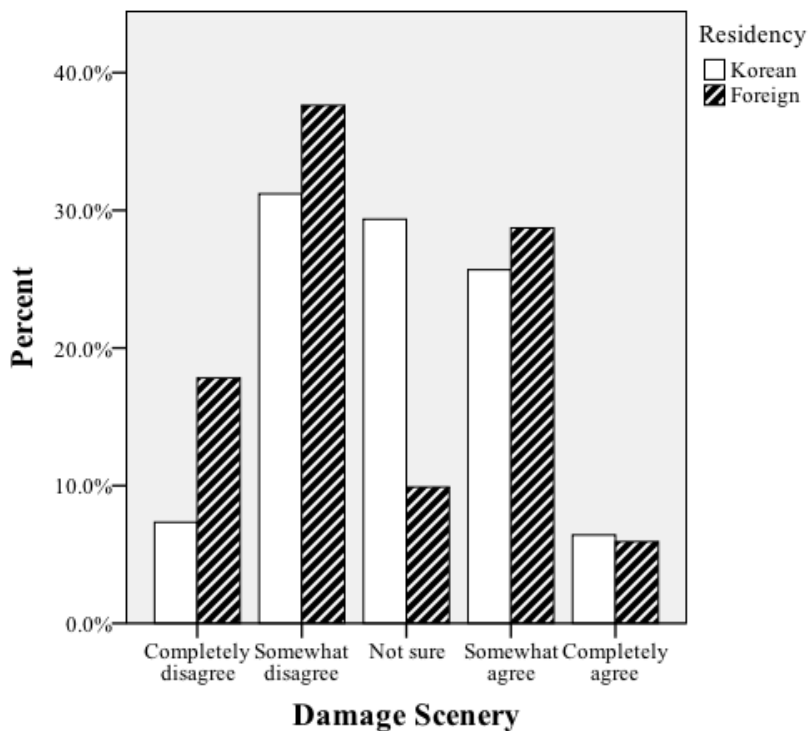
<Figure IV-8> Do you agree or disagree that wind farms disturb birds, animals, and their natural habitats?



indicates a positive perception towards wind farms.

The second environmental question asks whether the respondent agrees or disagrees that wind farms disturb birds, animals, and their natural habitats. There was a statistically significant difference in perceptions of how wind farms disturb the local wildlife among foreign residents ($M_f = 3.07$, $SD = 1.116$) and local residents ($M_l = 3.35$, $SD = .917$); $t(208) = 1.988$, $p = .048$. These results show that the foreign resident sample more strongly disagrees that wind farms disturb the local wildlife than the local resident sample. As you can see in figure IV-8, although both groups are somewhat evenly distributed, the local Korean residents tend to be unsure or lean toward somewhat agreeing that wind farms harm wildlife. The foreign residents are also relatively evenly distributed but with 20% disagreeing that wind farms harm wildlife. The foreign resident view that wind farms don't disturb birds, animals, and their natural habitats shows a positive perception towards wind

<Figure IV-9> Do you agree or disagree that wind farms damage areas of scenic beauty?



farms and their effects on the environment.

The third question asks whether the respondent agrees or disagrees that wind farms damage areas of scenic beauty. Surprisingly, there was not a statistically significant difference in perceptions of the effects of wind farms on the local landscape among foreign residents ($M_f = 2.67$, $SD = 1.234$) and local residents ($M_l = 2.93$, $SD = 1.060$); $t(208) = 1.599$, $p = .111$. This was a surprising result and the apparent differences that can be seen in figure IV-9 both groups are mixed and the differences are not statistically significant. Both groups are evenly distributed with the local group having doubts, leaning to the somewhat agree or disagree and 29% not sure. The foreign group on the other hand has an opinion either way, albeit not strong. The foreign group did not show strong convictions either way, but as only 10% were not sure, they had more of an opinion.

As was stated earlier, the literature shows that negative perceptions about the environmental effects leads to a negative view of wind power. The findings are consistent with this hypothesis that the local residents and the foreign residents would differ in their perceptions towards the environment. The local residents lean towards a more negative perception of the impacts of wind farms toward the environment while the foreign group leans towards a more positive view. These findings are also consistent with the literature. It was expected that the local group might have a stronger sense of place protection or NIMBY, which should result in more doubts about the environmental friendliness of wind farms.

4) Economic

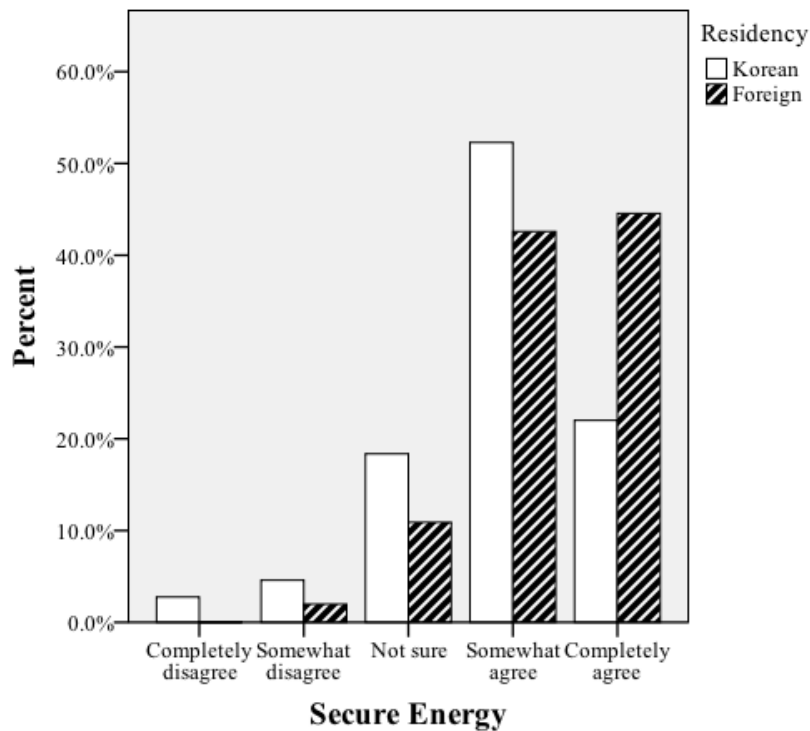
The next set of questions deal with how the respondents perceive the economic effects of wind power. The literature shows that political and socio-economic factors can be a cause for public discontent about wind power developments. Table IV-5 shows the results of the comparison of perceptions towards economic factors.

<Table IV-5> Comparison results of perceptions towards economic factors

Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Wind power can make a significant contribution to securing Jeju's energy requirements	3.86	.907	4.30	.742	-3.782	208	.000
Wind farms help develop the local economy	3.62	1.057	3.68	.989	-.443	207	.658
The wind industry in Jeju will create jobs	3.27	1.042	3.70	.889	-3.256	208	.001
Profits from wind energy should be shared with the local people	4.46	.703	4.55	.806	-.876	207	.382

Note: 1 = Strongly disagree, 2 = Somewhat disagree, 3 = Not sure, 4 = Somewhat agree, 5 = Strongly agree

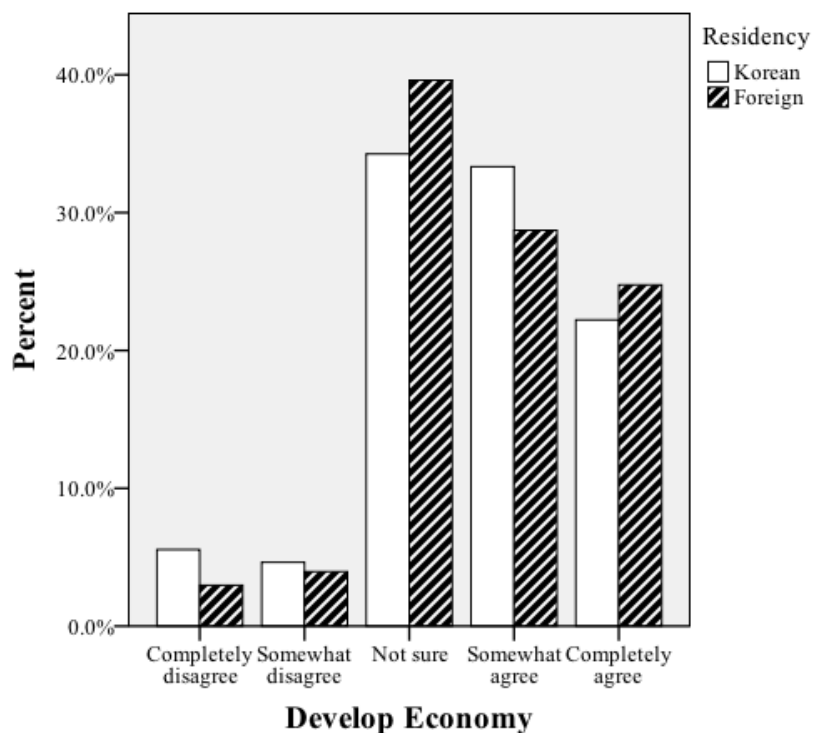
<Figure IV-10> Do you agree or disagree that wind power can make a significant contribution to securing Jeju's energy requirements?



The first question asks whether the respondent agrees or disagrees that wind power can make a significant contribution to securing Jeju's energy requirements. There was a highly statistically significant difference in agreement of the contribution of wind power to secure Jeju's energy requirements among foreign residents ($M_f = 4.30$, $SD = .742$) and local residents ($M_l = 3.86$, $SD = .907$); $t(208) = -3.782$, $p < .001$. These results show much stronger agreement for among the foreign residents than the local residents. Among the foreign residents, 88% agree that wind power can contribute to Jeju's energy requirements with 45% completely agreeing as can be seen in figure IV-10. On the other hand, the only 74% of local residents agree and they also show more of their doubts with 20% not sure and 7% disagreeing.

The next question asks whether the respondent agrees or disagrees that wind farms help develop the local economy. There was not a statistically significant difference in

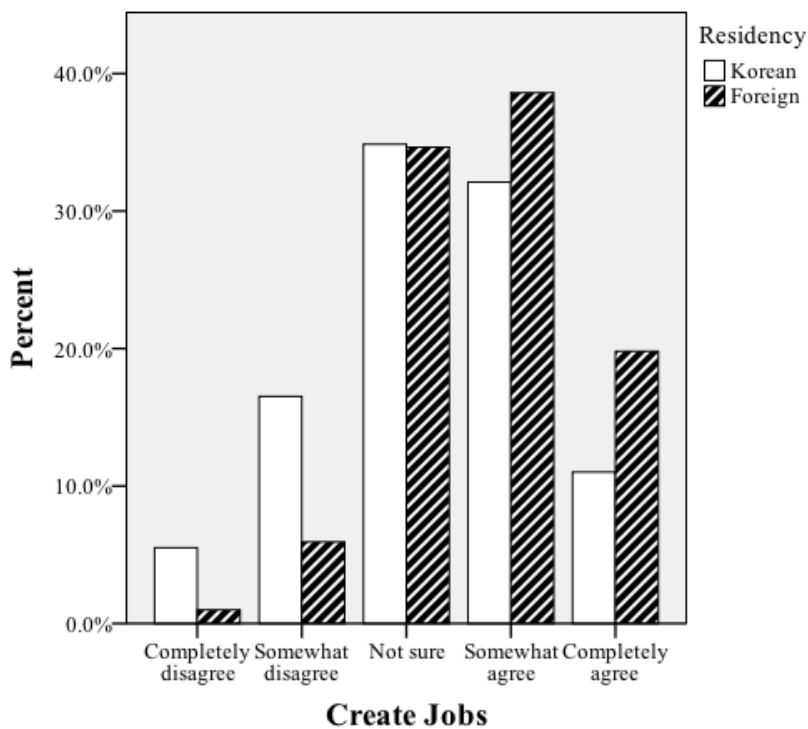
<Figure IV-11> Do you agree or disagree that wind farms help develop the local economy?



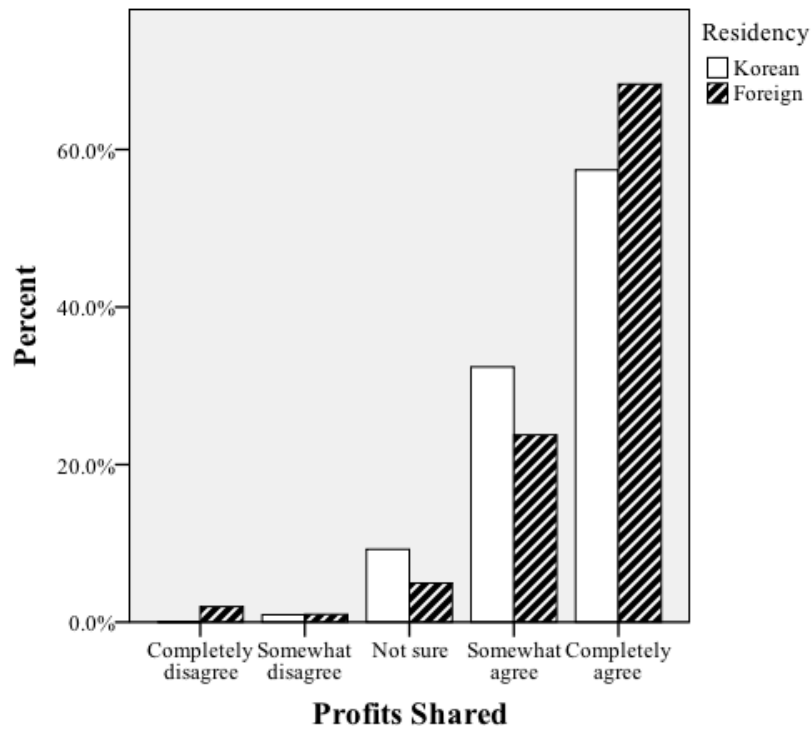
perceptions that wind farms help develop the local economy among foreign residents ($M_f = 3.68$, $SD = .989$) and local residents ($M_l = 3.62$, $SD = 1.057$); $t(207) = -.443$, $p = .658$. The results show similar support between both the local Korean and the foreign residents. Both groups of residents lean towards agreeing that wind farms help develop the local economy.

The third question in regards to economic factors asks whether the respondent agrees or disagrees that the wind industry in Jeju will create jobs. There was a highly statistically significant difference in perceptions of job creation among foreign residents ($M_f = 3.70$, $SD = .889$) and local residents ($M_l = 3.27$, $SD = 1.042$); $t(208) = -3.256$, $p = .001$. These results show that the foreign residents agree much more strongly than the local residents that wind industry in Jeju will create jobs. These results show doubts by the local Korean group about the economic benefits of wind power. Much more in the Korean group disagree (22%) while only 6% of the foreign group disagrees.

<Figure IV-12> Do you agree or disagree that the wind industry in Jeju will create jobs?



<Figure IV-13> Do you agree or disagree that profits from wind energy should be shared with the local people?



The fourth question asks whether the respondent agrees or disagrees that profits from wind energy should be shared with the local people. There was not a statistically significant difference in perceptions towards the sharing of profits among foreign residents ($M_f = 4.55$, $SD = .806$) and local Korean residents ($M_l = 4.46$, $SD = .703$); $t(207) = -.876$, $p = .382$. These results show no difference in perceptions between local and foreign residents with

<Table IV-6> Comparison results of attitudes towards public or private ownership

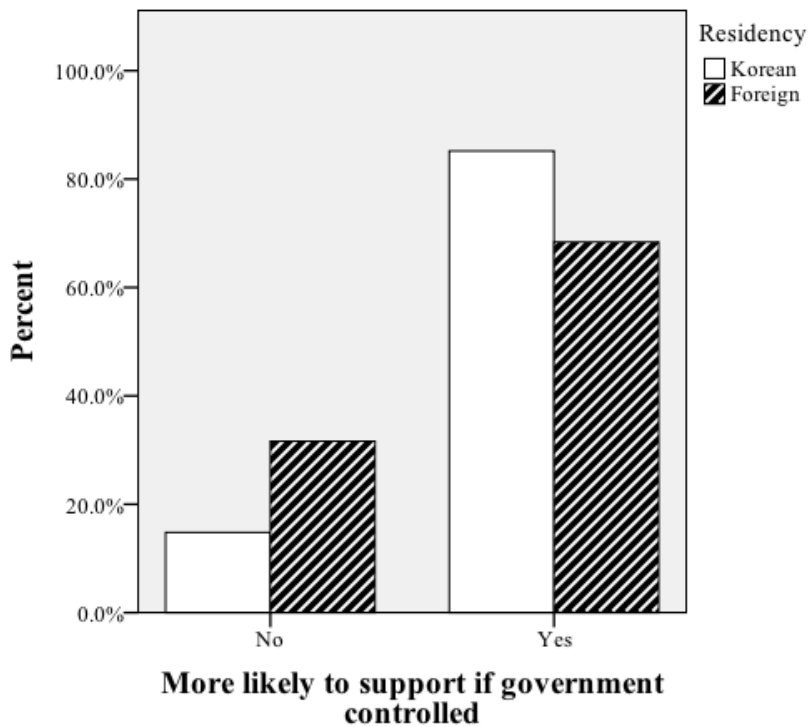
Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
More likely to support wind farms if they were owned and controlled by the local government rather than private developers. ^b	1.85	.357	1.68	.467	2.918	204	.004
Notes: a: 1 = Public, 2 = Private							
b: 1 = Oppose, 2 = Support							

both groups highly agreeing that profits should be shared.

The fifth question about economic factors asks if the respondent would more be more likely to support wind farms on Jeju if the were owned and controlled by the Jeju government rather than owned and controlled by private developers. Table IV-6 shows there was a highly statistically significant difference in support of among foreign residents ($M_f = 1.68, SD = .467$) and local Korean residents ($M_l = 1.85, SD = .357$); $t(205) = 2.918, p = .004$. These results show that both groups prefer government control of wind farms, there is much stronger support for government control among the local residents than among the foreign residents. In the local group, 85% of respondents are more likely to support wind farms if they are government controlled compared to 68% of the foreign group.

The results of the comparison between the two groups in terms of economic factors

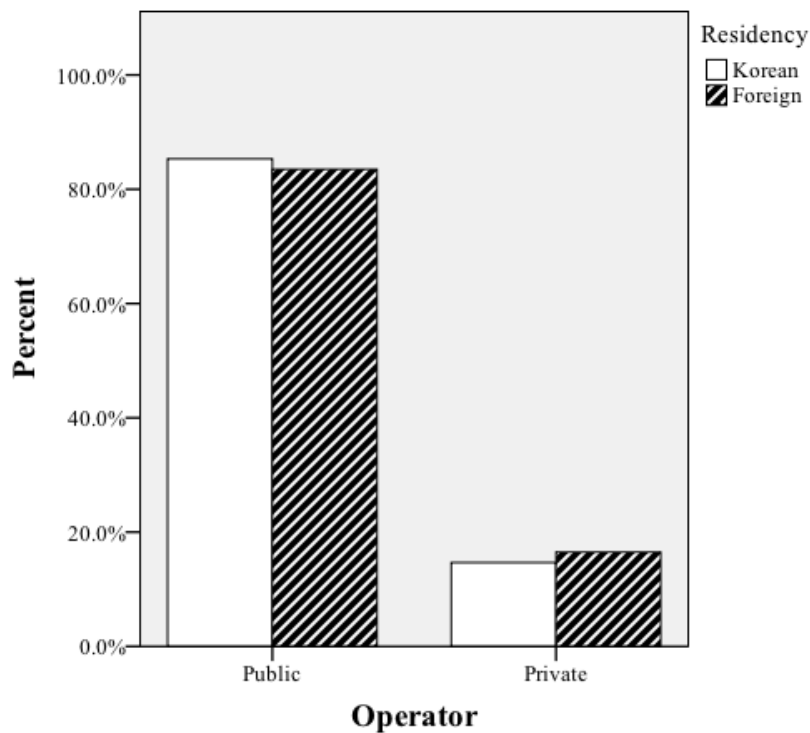
<Figure IV-14> Would you be more likely to support wind farms on Jeju if they were owned and controlled by the Jeju government rather than owned and controlled by private developers?



agree with the literature, which shows that negative perceptions towards economic factors will coincide with a negative view towards wind farms. The results are consistent with the hypothesis that the local residents and the foreign residents would differ in their perceptions towards the economic factors in two of the questions (wind farms securing Jeju's energy requirements and towards the wind industry's ability to create jobs). As with the environmental factors, it was expected that the local group might have a stronger sense of place protection or NIMBY, which should result in more doubts about the economic impacts of wind farms.

The next questions came from a previous survey completed by the Jeju Energy Corporation about who should control the wind farms for the people of Jeju, public or private companies (Jeju Energy Corporation, 2012). The respondents were then asked to choose a corresponding reason that best describes why believe the public or private company

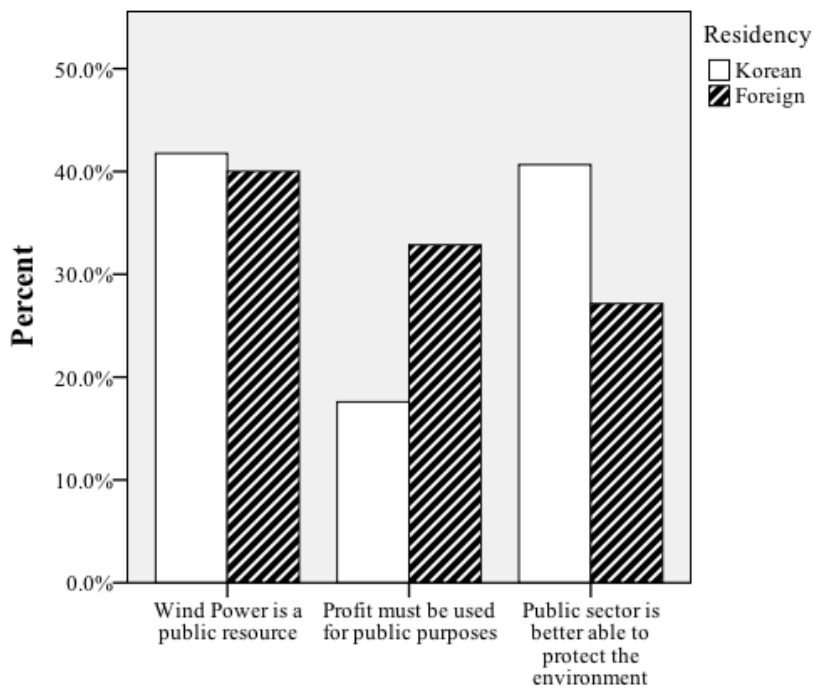
<Figure IV-15> Who should operate the wind power plants for the people of Jeju? Public or Private?



should control the wind energy. I thought it would be interesting to compare how the foreign group compared with the local group about this topic. The results can be found in figure IV-15, figure IV-16, figure IV-17.

The local and the foreign groups both answered similarly that they preferred the public companies to operate the wind farms on Jeju. The local group supports the public sector at 85% and 84% of the foreign respondents support the public sector. The remaining

<Figure IV-16> Reasons for public ownership of Jeju's wind farms

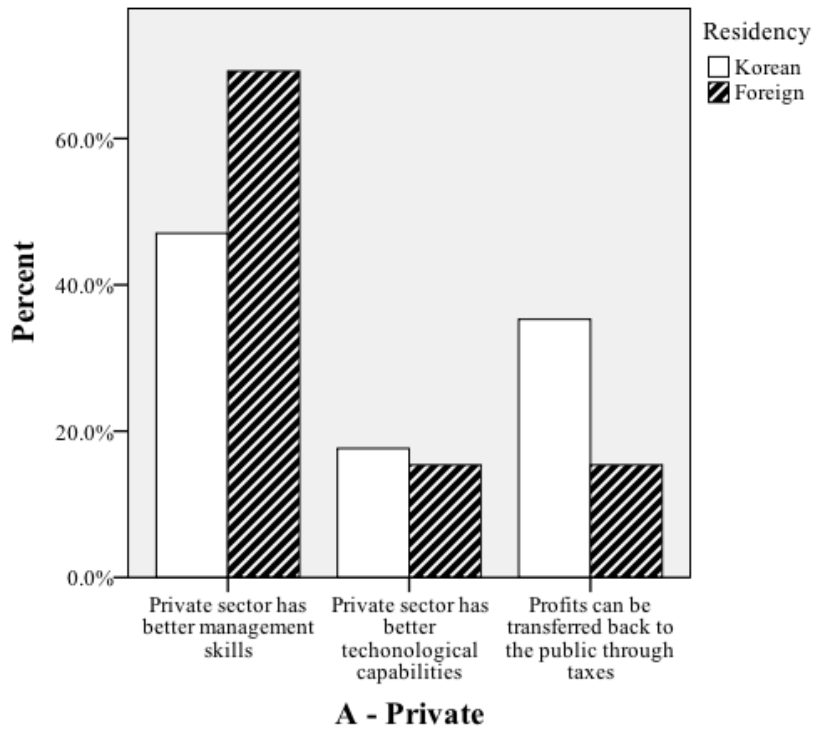


A - Public

15% of the local respondents support the private sector, while the remaining 16% of the foreign respondents support the private sector.

The first follow-up question asked why the respondent chose that they support the public sector. The results can be viewed in figure IV-16. Both groups of respondents (local = 42%, foreign = 40%) similarly chose that the reason they support the public sector is that wind is a public resource. The foreign group believed more than the local Korean group

<Figure IV-17> Reasons for private ownership of Jeju's wind farms



(local = 17%, foreign = 32.9%) that profits should be used for public purposes. The local group believed more than the foreign group (local = 40.7%, foreign = 27.1%) that the public sector is better able to protect the environment.

The second follow-up question was for those who responded that they preferred the private sector to control the wind farms of Jeju. The results can be viewed in figure IV-17. More in the foreign group preferred the private sector than the local Korean group due to the private sector's management skills (local = 47%, foreign 69%). Both groups had similar feelings about the technological capabilities of the private sector (local = 18%, foreign = 15%). The local Korean residents believed more than the foreign residents (local= 35%, foreign = 15%) that the profits can be transferred back to the public through taxes.

5) NIMBY

<Table IV-7> Comparison results of NIMBY support for wind farms

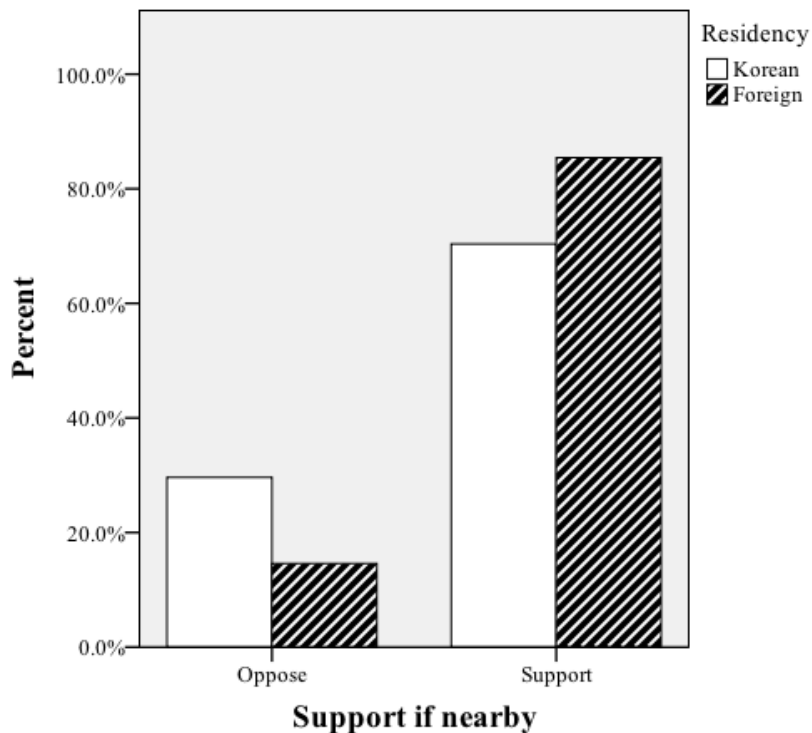
Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Support or opposition of turbines installed nearby	1.70	.459	1.85	.355	-2.596	202	.010
Seen	1.88	.326	1.84	.368	0.848	207	.397
See during routine	1.13	.336	1.16	.367	-0.618	208	.537

Note: 1 = Oppose, 2 = Support or 1 = No, 2 = Yes

The next set of questions deal with the NIMBY perceptions of wind farms. The literature states that in some instances, NIMBY factors can forecast resistance to planned projects. The results can be seen in table IV-7.

The first question asks whether the respondent would support or oppose wind turbines if they were to be installed near the area where they live. There was a highly statistically significant difference in support of the installation of wind turbines near the area where they

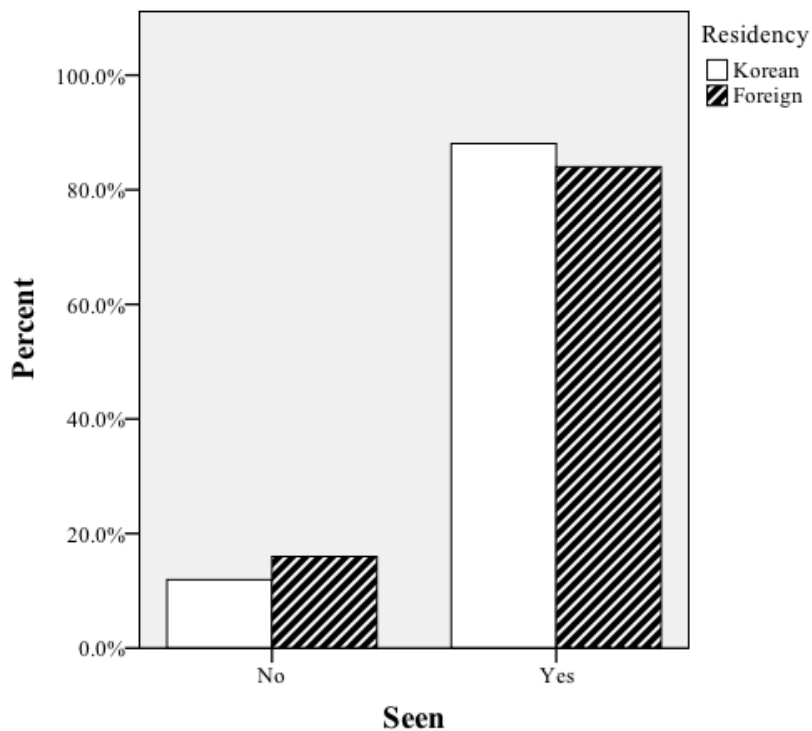
<Figure IV-18> If wind turbines were to be installed near the area where you live, would you support or oppose them?



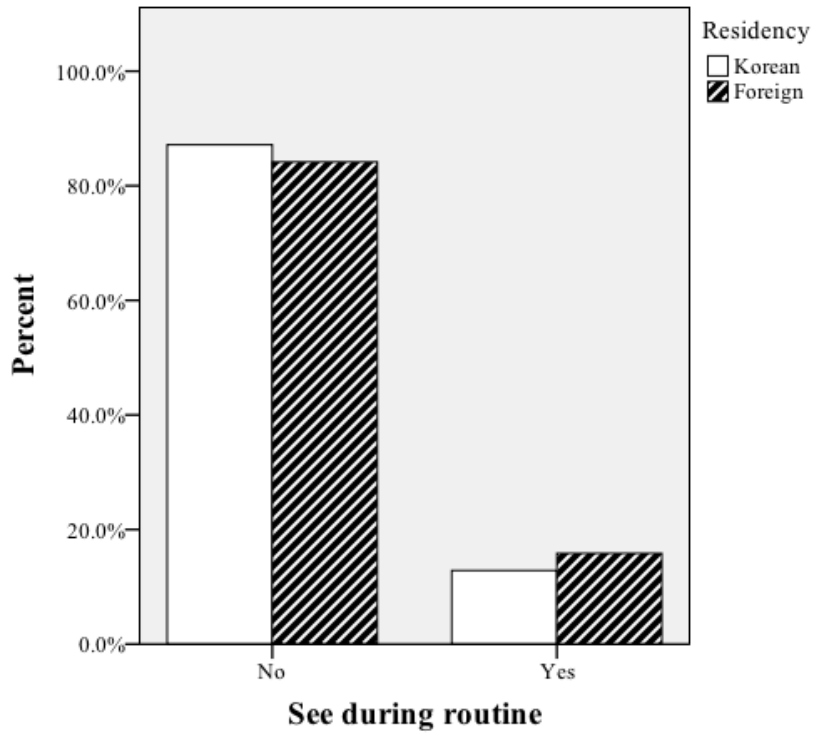
live among foreign residents ($M_f = 1.85$, $SD = .355$) and local Korean residents ($M_l = 1.70$, $SD = .459$); $t(202) = -2.596$, $p = .01$. These results show a much higher chance for opposition for locally installed wind turbines from the local Korean residents than from the foreign residents. The local group has a much stronger opposition with 30% of respondents opposing compared with 15% of the foreign respondents opposing.

The second question asks whether or not the respondent has ever seen a wind farm on Jeju. There was not a statistically significant difference between the foreign residents ($M_f = 1.84$, $SD = .368$) and local Korean residents ($M_l = 1.88$, $SD = .326$); $t(207) = -.848$, $p = .397$. These results show the majority (local 87%, foreign 84%) of both groups have seen wind farms on Jeju with no was no difference between the two groups.

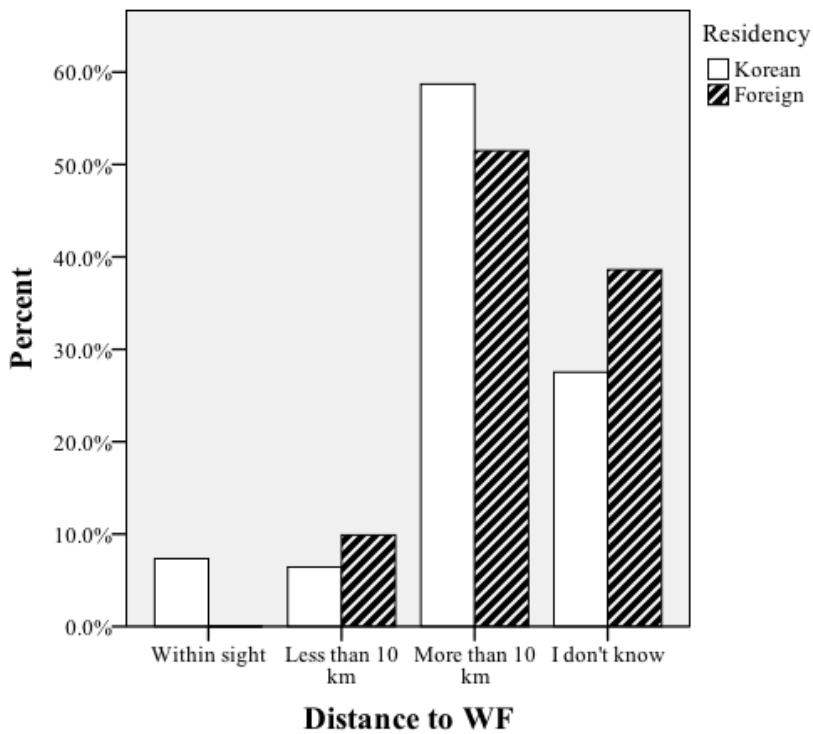
<Figure IV-19> Have you ever seen a wind farm on Jeju?



<Figure IV-21> Can you see wind farms during your day-to-day routine?



<Figure IV-20> How close is the nearest wind farm to your home?



The third question asks whether or not the respondent can see wind farms during their

day-to-day routine. There was not a statistically significant difference in ability to see wind farms daily among foreign residents ($M_f = 1.16$, $SD = .367$) and local Korean residents ($M_l = 1.13$, $SD = .336$); $t(208) = -.618$, $p = .537$. These results show that both groups similarly do not regularly see wind farms with no significant difference. As shown in figure IV-20, only 12% of local respondents and 16% of foreign respondents see wind farms daily.

Figure IV-21 describes the final NIMBY question asking the respondent how close the nearest wind farm is to their house. This question cannot be statistically analyzed but the results are interesting nonetheless. More than half of both groups (local = 59%, foreign = 51%) live more than 10km away from the nearest wind farm. Unfortunately, none (0%) of the foreign sample lives within sight of a wind farm. This could affect results and could be one explanation for the unanimous support in general in the foreign sample. Also interesting to note is that more of the foreign sample (local = 28%, foreign = 39%) isn't sure how far away the nearest wind farm is.

6) Knowledge

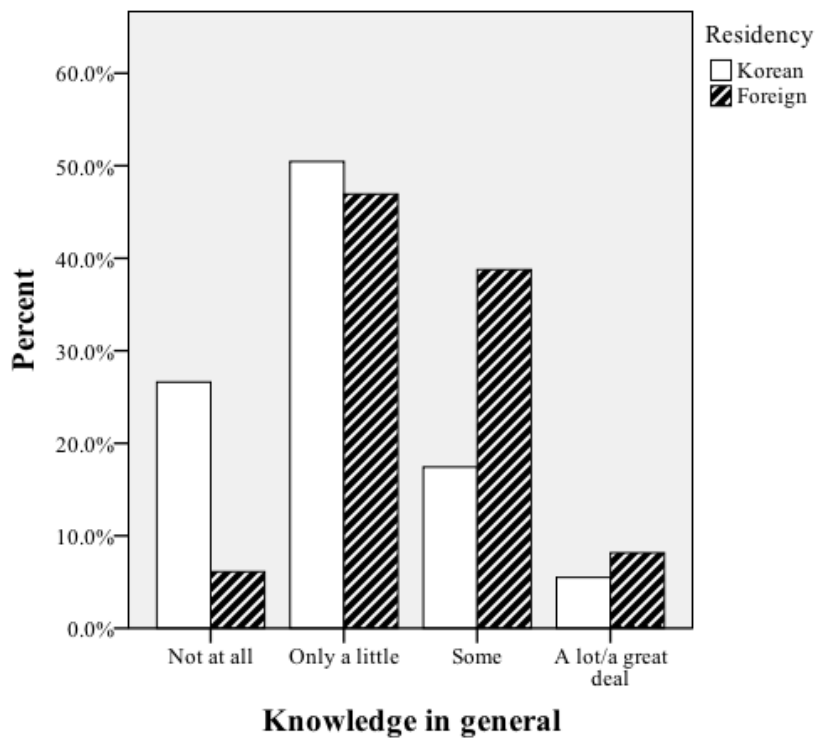
The next set of questions deal with the respondent's knowledge of wind power in general and in Jeju. The results of the comparison are shown in table IV-8. Although discredited by some studies, it is widely assumed that a higher support of wind power is related to more knowledge of wind power.

<Table IV-8> Comparison results of perceptions of knowledge of wind power

Variable	Local		Foreign		<i>t</i>	<i>df</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Knowledge of wind power in general	1.02	.816	1.49	.736	-4.347	205	.000
Knowledge of Jeju's wind energy plans	0.55	.713	0.76	.822	-1.945	206	.053
Knowledge of the costs of wind power	0.51	.812	0.98	.903	-3.918	206	.000
Note: 0 = not at all, 1 = Only a little, 2 = Some, 3 = A lot/a great deal							

The first question asks how much the respondent thinks they know about wind power in general. There was a highly statistically significant difference in perceptions of knowledge in general among foreign residents ($M_f = 1.49$, $SD = .736$) and local residents ($M_l = 1.02$, $SD = .816$); $t(205) = -4.347$, $p < .001$. These results show that foreign residents believe they

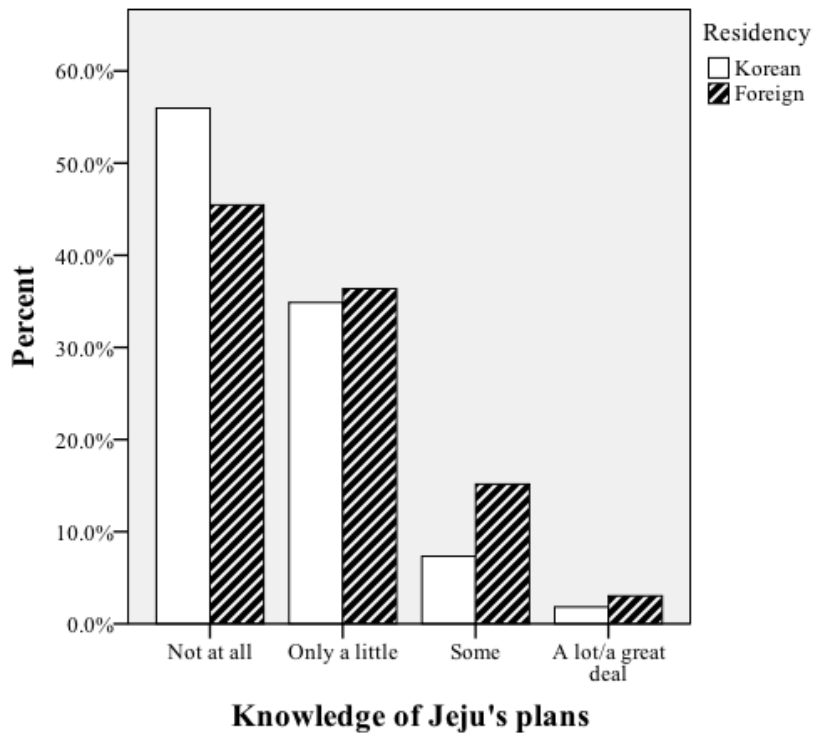
<Figure IV-22> How much do you think you know about wind power in general?



know more about wind power than the local residents. While neither group claims to know a great deal about wind power, it is interesting to note that 27% of the local residents compared to 6% of the foreign residents claim to know nothing at all about wind power. The foreign residents and local residents similarly claim only a little knowledge while 39% of the foreign residents claim some knowledge of wind power.

The next question asks how much the respondent thinks they know about Jeju's wind energy plans. There was not a statistically significant difference in knowledge of Jeju's wind energy plans among foreign residents ($M_f = 0.76$, $SD = .822$) and local Korean residents (M_l

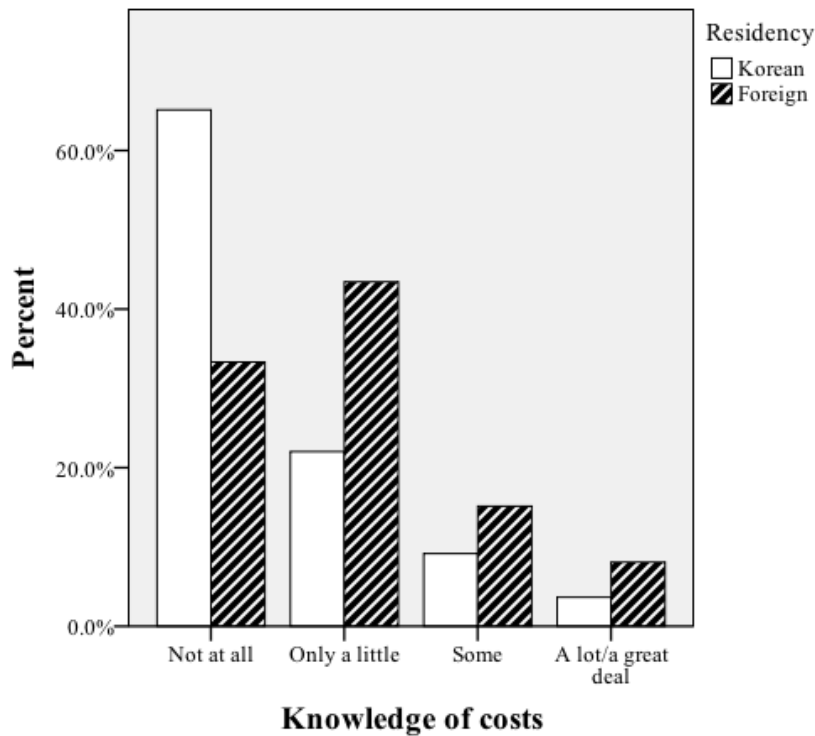
<Figure IV-23> How much do you think you know about Jeju's wind energy plans?



= 0.55, SD = .713.); $t(206) = -1.945, p = .053$. These results show both groups similarly mostly claim to know nothing or have only a little knowledge of Jeju’s wind energy plans. Only 2% of the local residents and 3% of the foreign residents claim a great deal of knowledge of Jeju’s wind energy plans. 91% of the local Korean residents and 81% of the foreign residents claim to know nothing or only a little about Jeju’s wind energy plans.

The third question asks how much the respondent thinks they know about the costs of wind power. There was a highly statistically significant difference in perceptions of knowledge of the costs of wind power among foreign residents ($M_f = 0.98, SD = .903$) and local residents ($M_l = 0.51, SD = .812$); $t(206) = -3.918, p < .001$. These results show that the local residents claim to know much less about the costs of wind power and the foreign residents claim to know much more about the costs of wind power. 65% of the local residents claim to know nothing at all, while only 33% of the foreign residents claim to

<Figure IV-24> How much do you think you know about the costs of wind power?



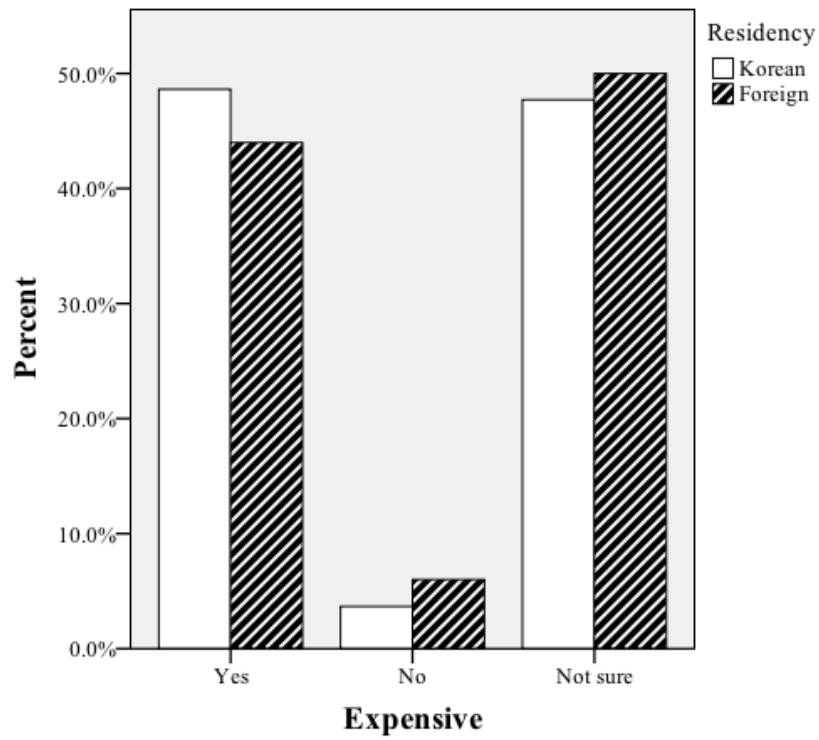
know nothing at all. Neither group claims to know a lot (local = 4%, foreign = 8%) but 43% of the foreign group claims to know a little compared to 22% of the local group.

The final question asks the respondent if they think wind power will make Jeju’s electricity rates more expensive. The respondents were given the choice of ‘yes,’ ‘no,’ or ‘not sure’. Due to the “not sure” the means cannot be statistically compared but the results of the question are interesting nonetheless.

Nearly half of both groups (local = 49%, foreign = 44%) believe wind power will increase electricity rates and nearly the other half (local = 48%, foreign = 50%) were not sure if wind power will increase electricity rates. Only a small percentage (local = 4%, foreign = 6%) said they don’t believe wind power will increase electricity rates.

There is a difference in perceptions of the knowledge of wind power in general and in knowledge of Jeju’s plans among the local and the foreign residents. The local Korean

<Figure IV-25> Do you think wind power will make Jeju's electricity rates more expensive?



residents claim to know little or not at all about wind power in general or in Jeju's wind energy plans. These results also follow the findings in the literature that less knowledge of the plans leads to less support overall.

V. CONCLUSIONS

1. Discussion

1) Support

Throughout the literature, wind power consistently shows a high level of support. The findings of the questionnaire show that a high level of general support exists for wind power in Jeju among the local Korean residents. This high level of general support is consistent in most wind energy findings (Wolsink, 2000). However the difference of their support as compared to the foreign residents is statistically significant and the difference leans towards less support in the local Jeju residents (88%) than the foreign residents (96%) who showed a near unanimous support for the development of wind power in Jeju. The results show that the possibility to increase support remains. The comparison of the local Korean residents to the foreign residents in the other categories points out factors that the residents believe in that can lead towards greater acceptance of wind energy technology.

The local residents could be showing less support due to a stronger sense of place protection than the foreign residents. The results also show hints of place protection in that the Korean residents oppose wind turbines the idea of locally installed wind turbines significantly more than the local foreign residents.

There could also be many alternative explanations for the differences in support, but one possible explanation that cannot be ruled out could be due to some the differences in demographics of the foreign population who tend to be younger and work in professional fields that could not be helped when distributing this survey.

2) Environment

In the survey, the respondents were asked a series of questions in regards to the environmental impacts of wind farms. The responses towards these questions showed some of the most striking differences in the comparison between the two samples. In particular, two responses showed large differences in opinions. First, significantly fewer foreign residents believe that the noise bothers their daily life. Second, the significantly fewer foreign residents believe that the wind farms harm local wildlife. Although few foreign residents claimed to live within 10km of a wind farm, they were much more positive on the environmental impacts. Interestingly, although there is no statistically significant difference, foreign residents tended to be much more split in their opinions about the effects of the wind turbines on the landscape. The Korean respondents (32%) more than foreign respondents (10%) said that they were not sure. This shows that the people of Jeju have not quite made their mind up about the effects of wind turbines on the local landscape. The split decision shown by the foreign residents could show that they have more familiarity with wind energy and have thus acquired well-formed opinions about wind turbines. Both groups lean towards belief that wind farms do not damage the landscape.

3) Knowledge

Wind power is a young and industry in Korea as compared to countries such as the U.S. and U.K. The Jeju people are no strangers to the wind but are new to the idea of using the wind and using wind power. One hope of this study is that the foreign residents coming to Jeju from their respective foreign countries might have some experience in wind power. The people of Jeju are more familiar with the wind than in many countries and places in the world. Questions regarding country of origin were not included in this survey and neither were questions about previous knowledge of wind power in their own country, but it is

possible to assume that most respondents come from a country that has wind power. The findings indeed show a significant difference in the amount of knowledge of wind energy in general that might be attributed to the prior knowledge that the foreign residents bring from their own country.

The greater amount of knowledge might account for the foreign population's seemingly more decisive answers in regards to clean energy and the environment. In terms of clean energy on all counts, the foreign respondents responded that clean energy is needed, wind is a reliable source of energy, and that that Jeju needs to utilize more wind power to fulfill its energy needs. The last point is a highly significant difference. This is a very interesting point and points out some of the reservations the Jeju people have to towards wind power that the foreign population doesn't.

4) Profits

In looking at the local Korean media, a point of debate about wind energy in the local community seems to be how the profits that come from wind are distributed (Huh, 2013). The media shows that the local people are concerned that the large corporations are taking advantage of the local people and that the money will leave the island. The local people are concerned not only about foreign corporations, but they are highly concerned about mainland corporations taking profits off the island. The results of this study show that everyone unanimously agrees that the profits achieved from wind energy should be shared. Everyone also agrees that wind energy will develop the local economy.

The results of the survey show that the local Korean residents don't completely agree that Jeju needs more wind power to fulfill its energy demands, that wind can make a significant contribution towards Jeju's energy requirements, or that the wind industry will help create jobs. If the Jeju people feel less sure that wind energy will help secure Jeju's energy requirements, the local people might not be thinking quite as global as the foreign

respondents who might see energy conflicts as a threat to their own national security. One might assume that as the Jeju people look for more and more autonomy from the mainland that securing their energy sources would be a part of the plan for autonomy.

A possible explanation for the doubts towards the effects of wind power on the local economy could come from the lack of knowledge found in the survey. The local Korean residents don't feel as confident in their knowledge of wind power in general. This lack of confidence can cause doubts in the government's plans. If the knowledge gap is filled then it is likely that support of wind power will not only continue, but grow.

5) Public vs. Private

Every country has its own way of dealing with ownership of wind energy. Some countries such as the U.S. favor large multinational corporations to control the wind industry whereas some countries such as the U.K. meet fierce opposition. Some areas favor large-scale developments and some areas favor smaller scale. The surveys show that both groups favor public ownership of the wind farms over private ownership. The local Jeju people however feel that they would be more likely to support wind energy if it is publicly owned than privately owned.

Around 85% of both groups responded that they favored the public sector over the private sector to operate the wind farms on Jeju. However, more foreign residents than Korean residents responded that they would not be more likely to support wind farms on Jeju if they were owned and controlled by the Jeju government. This is an interesting finding as it might display some distrust of the Jeju government.

Both groups equally agree that wind power is a public resource. However, the foreign group, more than the Korean group, believes that wind power should be controlled by the public sector because the profit must be used for public purposes. The Korean group on the other hand prefers the public sector due to its ability to better protect the environment.

2. Implications of the Research

With the emergence and rapid growth of wind power in less than a decade, it's important to understand how the public perceives this technology. Before now, little formal research has surveyed the attitudes of Jeju residents towards wind power.

This study provides a clear and accurate survey of the attitudes toward wind power of the residents of Jeju Island. On the whole, the Jeju Island people have more concerns about wind power than the foreign residents. The local residents have less general support, more concerns about the environment; more doubts about economic effects of wind farms, and less knowledge in general. This is useful for the government and developers in decision making for siting future renewable energy technology. The opposition that exists in most of the literature tends to focus around an environmental base. The opposition that seems to exist by the Jeju Island residents encompasses environmental and financial areas. In Jeju, there just doesn't seem to be as much opposition as doubts about wind power in general.

Throughout the literature, one of the major themes in getting wind development projects started is including the public in the decision making progress and allowing them to have a stake in the projects. When people first hear about wind projects, not only in Jeju, but also throughout the world they aren't necessarily opposed to the projects themselves but might be opposed any number of other factors. Often, local residents tend to be opposed to any kind of top-down planning that big corporations are accustomed to. Jeju Island in its tourist industry has seen this kind of top-down planning in the numerous resorts and development projects. The local residents have to live with the resorts, but they perceive very little of their financial effects. They have seen profits from these big mega-resorts leave the island. The islanders are often confronted with a plan, and forced to fight and modify it. (Kwon, 2008)

Community participation has been shown to improve support. The success in the established and developed wind industry in European countries as Denmark and Portugal is attributed to community based wind projects (Christiansan and Lund, 1998). It's important to remember that there is more than one way to bring community benefits to an area. Szarka (2006) emphasizes the need for enhancing community participation stakeholder involvement. The following modes for enhancing community participation as seen in <Table V-1> could be useful for local developers.

Jeju Island's own Gasi Village, a highly popular community based wind project is a model for future development in Korea and in the world. Gasi Village is a model of not only community benefits but also community participation. Wind power has brought such a successful rural revitalization that Gasi-ri can be said to have 'won the lottery' (Hilty 2012). This type of rural revitalization is replicable in other areas. I recommend Jeju government to follow along those lines of putting the community first when planning its wind power projects. Other studies have found that it will be especially important to get the community involved when it comes to the offshore wind farms (Haggett, 2011).

<Table V-1> Modes for enhancing community participation

Mode	Result
Empowerment through decision-making	The locals are involved in the process
Local community benefits	Shared profits
Local taxation	Revenue to enhance the community
Incentives to local energy consumption	Cheaper, greener energy to locals
Economic regeneration	Profits stimulate job creation
Environmental regeneration	Profits improve the surrounding land

Source: (Szarka, 2006)

Finally, the fact that the foreign residents have a nearly unanimously positive view towards wind power in Jeju the local government can use this information to know that the world is accepting Jeju's green growth image.

3. Future Research

This research is limited to onshore wind power and nothing in the survey suggests applies to offshore wind turbines specifically. Offshore wind power is a relatively new technology and as a result, only a handful of studies have been undertaken. As Jeju Island's plans for onshore wind are nearly complete, and the island's future plans include lofty offshore projects, further research into the attitudes of offshore could be useful. The research was also limited by focusing on surveying residents throughout the island rather than residents directly affected by wind farms. Future research of those directly affected could help fill this gap.

Appendix A - Descriptive Statistics

<Table 0-1> Descriptive Statistics

#	Question	N		Minimum		Maximum		Mean		Std. Deviation	
		Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign	Local	Foreign
1	Support/Oppose	109	100	1	1	2	2	1.88	1.97	.326	.171
2	Clean Energy	109	101	1	3	5	5	4.15	4.39	.870	.648
3	Reliable	109	101	1	2	5	5	3.89	4.15	.956	.792
4	Need More Wind	109	101	1	2	5	5	3.83	4.50	.977	.716
5	Noise	109	100	1	1	5	5	3.06	1.85	.955	1.077
6	Birds/Animals/ Habitats	109	101	1	1	5	5	3.35	3.07	.917	1.116
7	Damage Scenery	109	101	1	1	5	5	2.93	2.67	1.060	1.234
8	Secure Energy	109	101	1	2	5	5	3.86	4.30	.907	.742
9	Develop Economy	108	101	1	1	5	5	3.62	3.68	1.057	.989
10	Create Jobs	109	101	1	1	5	5	3.27	3.70	1.042	.889
11	Profits Shared	108	101	2	1	5	5	4.46	4.55	.703	.806
12	Operator	109	97	1	1	2	2	1.15	1.16	.356	.373
13	A - Public	91	70	1	1	3	3	1.99	1.87	.913	.815
14	A - Private	17	13	1	1	3	3	1.88	1.46	.928	.776
15	More likely to support if Gov't controlled	108	98	1	1	2	2	1.85	1.68	.357	.467
16	Support if nearby	108	96	1	1	2	2	1.70	1.85	.459	.355
17	Seen	109	100	1	1	2	2	1.88	1.84	.326	.368

18	Distance to WF	109	101	1	2	4	4	3.06	3.29	.797	.638
19	See during routine	109	101	1	1	2	2	1.13	1.16	.336	.367
20	Knowledge in general	109	98	0	0	3	3	1.02	1.49	.816	.736
21	Knowledge of Jeju's plans	109	99	0	0	3	3	.55	.76	.713	.822
22	Knowledge of costs	109	99	0	0	3	3	.51	.98	.812	.903
23	Expensive	109	100	1	1	3	3	1.99	2.06	.986	.973
24	Gender	109	100	1	1	2	2	1.48	1.43	.502	.498
25	Age	109	100	1	1	5	5	2.41	1.63	1.219	.774
26	Education	109	100	1	2	3	3	2.63	2.98	.555	.141
27	Income	105	98	1	1	5	6	2.50	3.03	1.316	1.439
28	Employment	108	98	1	1	5	5	3.67	1.85	1.353	1.068
29	Location	108	98	1	1	4	4	2.33	2.07	1.094	1.270
30	Years in Jeju	0	98	-	1	-	4	-	2.35	-	1.159

<Table 0-4> Support or opposition for wind power in Jeju

	Oppose		Support	
	Local %	Foreign %	Local %	Foreign %
Support/Oppose	12	3	88	97

<Table 0-2> Frequencies of clean energy responses

Variable	Completely disagree		Somewhat disagree		Not sure		Somewhat agree		Completely agree	
	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %
Clean energy	2	0	4	0	9	9	49	44	37	48
Reliable	3	0	6	4	18	13	47	48	27	36
Need more wind	3	0	7	1	18	10	47	27	25	62

<Table 0-3> Frequencies of environmental responses

Variable	Completely disagree		Somewhat disagree		Not sure		Somewhat agree		Completely agree	
	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %
Noise	7	53	13	19	53	21	19	4	7	3
Birds/animals /habitats	2	11	16	19	38	30	36	34	9	7
Damage scenery	7	18	31	38	29	10	26	29	6	6

<Table 0-7> Frequencies of economic factor responses

	Completely disagree		Somewhat disagree		Not sure		Somewhat agree		Completely agree	
	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %
Secure energy	3	0	5	2	18	11	52	43	22	45
Develop economy	6	3	5	4	34	40	33	29	22	25
Create jobs	6	1	17	6	35	35	32	39	11	20
Share profits	0	2	1	1	9	5	32	24	57	68

<Table 0-6> Frequencies of likeliness to support wind power if controlled by the local government

	No		Yes	
	Local %	Foreign %	Local %	Foreign %
More likely to support if government controlled	15	32	85	68

<Table 0-5> Frequencies of who should operate the wind power plants of Jeju?

	Public		Private	
	Local %	Foreign %	Local %	Foreign %
Operator	85	84	15	16

<Table 0-9> Reasons for desiring public or private ownership of wind farms

	Frequency		Valid Percent	
	Local %	Foreign %	Local %	Foreign %
Public				
Wind power is a public resource	38	28	42	40
Profit must be used for public purposes	16	23	18	33
Public sector is better able to protect the environment	37	19	41	27
Total	91	70		
Private				
Private sector has better management skills	8	9	47	69
Private sector has better technological capabilities	3	2	18	15
Profits can be transferred back to the public through taxes	6	2	35	15
Total	17	13		

<Table 0-8> Frequencies of NIMBY support responses

	Oppose		Support	
	Local %	Foreign %	Local %	Foreign %
Support or oppose if nearby	30	15	70	85

<Table 0-10> Frequencies of ability to see a wind farm

	No		Yes	
	Local %	Foreign %	Local %	Foreign %
Have seen a wind farm	12	16	88	84
See a wind farm daily	87	84	13	16

<Table 0-12> Frequencies of NIMBY responses

	No		Yes	
	Local %	Foreign %	Local %	Foreign %
Have seen a wind farm	12	16	88	84
See during routine	87	84	13	16

<Table 0-11> Proximity to wind farms

	Within Sight		Less than 10km		More than 10km		I don't know	
	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %
Proximity to wind farm	7	0	6	10	59	51	28	39

<Table 0-13> Frequencies of knowledge factor responses

	Not at all		Only a little		Some		A lot / a great deal	
	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %	Local %	Foreign %
Knowledge in general	27	6	50	47	17	39	6	8
Knowledge of Jeju's plans	56	45	35	36	7	15	2	3
Knowledge of costs	65	33	22	43	9	15	4	8

Appendix B: English Survey

Hello,

Thank you for providing a moment of your precious time.

I am conducting a research project for the Master's Program at the College of Social Sciences at Jeju National University comparing attitudes towards wind power between local and foreign residents.

Jeju Island, famous for its wind, is home to the first wind farm in Korea. There are currently nine wind farms operating in Jeju producing 146MW of electricity. In 2012, Jeju announced its "Carbon Free Island Jeju by 2030" plan in which Jeju plans to become fully self sustainable with renewable resources by 2030. To meet the first stage of this goal by 2020, Jeju plans to install on-shore wind turbines (300MW) and offshore turbines (1GW).

Your honest and thoughtful answers will be useful in developing our understanding of the attitudes towards wind power on Jeju Island. This survey follows Statistical Laws 33 and 34 in that all of your answers will be kept private and will not be used for any other purpose than this study.

Thank you.

2013. 10.

Daniel Kojetin, Masters Student, Department of Public Administration, Jeju National University College of Social Sciences

E-mail: dankojetin@gmail.com,

Phone: 064-754-2904, 010-7561-0109

Advisor: Kee Min, Professor of Public Administration, Jeju National University College of Social Sciences

1) Do you support or oppose the development of wind power on Jeju?

- 1 Support
- 2 Oppose

2) Do you agree or disagree that wind farms produce clean energy?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

3) Do you agree or disagree that wind power is a reliable source of energy?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

4) Do you agree or disagree that we should use more wind energy to fulfill Jeju's energy demands?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

5) Do you agree or disagree that the noise from wind farms disturbs your daily life?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

6) Do you agree or disagree that that wind farms disturb birds, animals, and their natural habitats?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

7) Do you agree or disagree that wind farms damage areas of scenic beauty?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

8) Do you agree or disagree that wind power can make a significant contribution to securing Jeju's energy requirements?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

9) Do you agree or disagree that wind farms help develop the local economy?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

10) Do you agree or disagree that the wind industry in Jeju will create jobs?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

11) Do you agree or disagree that profits from wind energy should be shared with the local people?

- 1 Completely agree
- 2 Somewhat agree
- 3 Not sure
- 4 Somewhat disagree
- 5 Completely disagree

12) Who should operate the wind power plants for the people of Jeju?

- 1 Public sector
- 2 Private sector

If you answered the “public sector” ○1, please answer the following question.

13) Why do you prefer the public sector to control the wind power on Jeju?

- 1 Wind power is a public resource.
- 2 Profit generated from wind power must be used for public purposes.
- 3 The public sector is better able to protect the environment than the private sector

If you answered “private sector” ○2, please answer the following question.

14) Why do you prefer the private sector to control wind power on Jeju?

- 1 The private sector has more effective management skills and expertise.
- 2 The private sector has better technological capabilities.
- 3 Profits can be transferred back to the public through taxes.

15) Would you be more likely to support wind farms on Jeju if they were owned and controlled by the Jeju government rather than owned and controlled by private developers?

- 1 Yes
- 2 No

16) If wind turbines were to be installed near the area where you live, would you support or oppose them?

- 1 Support
- 2 Oppose

17) Have you ever seen a wind farm on Jeju?

- 1 Yes
- 2 No

18) How close is the nearest wind farm to your home?

- 1 Within sight
- 2 Less than 10 km
- 3 More than 10 km
- 4 I don't know

19) Can you see wind farms during your day-to-day routine?

- 1 Yes
- 2 No

20) How much do you think you know about wind power in general?

- 1 A lot/a great deal
- 2 Some
- 3 Only a little
- 4 Not at all

21) How much do you think you know about Jeju's wind energy plans?

- 1 A lot/a great deal
- 2 Some
- 3 Only a little
- 4 Not at all

22) How much do you think you know about the costs of wind power?

- 1 A lot/a great deal
- 2 Some
- 3 Only a little
- 4 Not at all

23) Do you think wind power will make Jeju's electricity rates more expensive?

- 1 Yes
- 2 No
- 3 Not sure

General Demographics

24) Are you male or female?

- 1 Male
- 2 Female

25) How old are you?

- 1 19 - 29 years old
- 2 30 - 39 years old
- 3 40 - 49 years old
- 4 50 - 59 years old
- 5 More than 60 years old

26) What is your highest level of education?

- 1 Less than high school
- 2 High school diploma
- 3 University or technical college. (some college, currently enrolled, graduated)

27) What is your total annual household income (before taxes)?

- 1 Less than 19,999,999 won
- 2 20,000,000 - 29,999,999 won
- 3 30,000,000 - 39,999,999 won
- 4 40,000,000 - 49,999,999 won
- 5 50,000,000 - 59,999,999 won
- 6 Greater than 60,000,000 won

28) Describe your type of employment.

- 1 Public official (government, public school teacher)
- 2 Professional (doctor, professor, private school teacher, pharmacist, lawyer, surveyor, accountant, minister)
- 3 Manufacturing, retail, service (office worker, sales, etc.)
- 4 Farming and agriculture
- 5 Student, housewife, unemployed, and other

29) Where do you live?

- 1 Jeju City
- 2 Jeju City (northern) rural areas (eup, myeon)
- 3 Seogwipo City
- 4 Seogwipo City (southern) rural areas (eup, myeon)

30) How many years have you lived in Jeju?

- 1 Less than 1 year
- 2 1 - 2 years
- 3 3 - 4 Years
- 4 More than 5 years

31) Are you a Korean resident or a foreign resident of Korea?

- 1 Korean resident
- 2 Foreign resident

Appendix C: Korean Survey

안녕하십니까?

먼저 귀중한 시간을 할애해 주신 것에 대해서 감사드립니다.

저는 제주대학교 대학원 행정학과 석사 과정에 재학 중인 미국에서 유학 온 다니엘 코우틴이라고 합니다. 저는 제주특별자치도의 풍력발전에 대한 제주도민과 제주에서 거주하고 있는 외국인이 가지고 있는 인식을 상호 비교하는 연구를 진행하고 있습니다.

바람으로 유명한 제주도는 한국 최고의 풍력발전 후보지입니다. 현재 제주에는 146MW 의 전력을 생산하고 있는 풍력발전소가 있습니다. 지난해 제주도는 “2030 년 탄소 없는 섬, 제주” 계획을 발표했습니다. 이 목표를 달성하기 위하여 제주에는 앞으로 많은 풍력발전 시설이 설치될 것입니다.

제주특별자치도의 풍력발전 대한 귀하의 답변은 향후 제주도 풍력발전정책에 많은 도움이 될 것입니다. 본 설문에 대한 응답 내용은 통계법 제 33 조 및 제 34 조에 의거하여 비밀이 철저히 보장되며 연구목적 외의 다른 어떤 용도로도 사용되지 않을 것임을 약속드립니다.

대단히 감사합니다.

2013. 10.

연구자: 제주대학교 행정학과 석사과정 다니엘 코우틴

문의사항: 064-754-2904, 010-7561-0109

지도교수: 제주대학교 행정학과 민기 교수

1) 귀하는 제주에서 풍력발전을 한다면 찬성하십니까 또는 반대하십니까?

- ① 찬성
- ② 반대

2) 귀하께서는 풍력발전이 청정에너지를 생산한다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

3) 귀하께서는 풍력발전이 안정적인 에너지원이라고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

4) 귀하께서는 제주의 에너지 수요를 충족하기 위해서 보다 많은 풍력발전이 필요하다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

5) 귀하께서는 풍력발전에서 나오는 소음이 일상생활에 지장을 준다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

6) 귀하께서는 풍력발전이 동·식물의 서식지를 파괴한다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

7) 귀하께서는 풍력발전이 자연경관을 훼손한다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

8) 귀하께서는 풍력발전이 제주 에너지 수요를 확보하는데 있어서 큰 기여를 할 것이라고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

9) 귀하께서는 풍력발전이 지역 경제 발전에 도움이 된다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

10) 귀하께서는 제주의 풍력발전이 일자리 창출에 기여할 것이라고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

11) 귀하께서는 풍력발전에서 나온 이익을 지역주민들과 공유해야 한다고 생각하십니까?

- ① 매우 그렇다
- ② 대체로 그렇다
- ③ 잘 모르겠다
- ④ 대체로 그렇지 않다
- ⑤ 전혀 그렇지 않다

12) 누가 제주도의 풍력발전사업을 수행하는 것이 도민의 이익에 부합한다고 생각하십니까?

- ① 제주도가 **지방공기업**을 설립하여 그 기업으로 하여금 풍력발전사업을 수행 하도록 한다.
- ② 제주도가 풍력발전사업에 관여하기 보다는 **민간기업**으로 하여금 풍력발전사업을 수행하도록 한다.

(12 번 문항에 ①번을 답한 사람만) 다음 질문에 답하십시오.

13) **지방공기업**을 설립하여 풍력발전사업을 수행하도록 하는 이유는 무엇입니까? 해당사항에 표시 해주시기 바랍니다.

- ① 풍력은 제주도의 공적자원이기 때문이다.
- ② 풍력을 활용한 이익은 공적으로 회수되어야 하기 때문이다.
- ③ 제주도의 공유자원이 무분별하게 개발되지 않도록 해야 하기 때문이다.

(12 번 문항에 ②번을 답한 사람만) 다음 질문에 답하십시오.

14) 제주도가 풍력사업에 관여하기 보다는 **민간기업**으로 하여금 풍력발전사업을 수행하도록 하는 이유는 무엇입니까? 해당사항에 표시 해주시기 바랍니다.

- ① 민간기업의 경영능력과 전문성을 활용해야 하기 때문이다.
- ② 민간기업의 풍력사업관련 기술력이 높기 때문이다.
- ③ 이익이 발생할 경우 세금을 통해서 환수할 수 있기 때문이다.

15) 귀하께서는 민간기업이 풍력발전을 소유하고 경영하는 것보다 제주도의 지방공기업이 하는 것을 더 찬성하십니까?

- ① 네
- ② 아니오

16) 귀하께서는 귀하가 살고 있는 지역에 풍력발전기가 설치된다면 찬성하시겠습니까?

- ① 찬성
- ② 반대

17) 귀하께서는 제주에서 풍력발전을 본적이 있습니까?

- ① 네
- ② 아니오

18) 귀하의 집으로부터 가장 가까운 곳에 설치된 풍력발전기와의 거리는 얼마나 됩니까?

- ① 볼 수 있는 거리
- ② 10km 미만
- ③ 10km 이상
- ④ 모른다

19) 귀하께서는 매일 풍력발전기를 볼 수 있습니까?

- ① 네
- ② 아니오

20) 귀하께서는 풍력발전에 대해서 얼마나 알고 있습니까?

- ① 매우 잘 알고 있다
- ② 어느 정도 알고 있다
- ③ 약간 알고 있다
- ④ 모르고 있다

21) 귀하께서는 제주도의 풍력발전 계획에 대해 얼마나 알고 있습니까?

- ① 매우 잘 알고 있다
- ② 어느 정도 알고 있다
- ③ 약간 알고 있다
- ④ 모르고 있다

22) 귀하께서는 풍력발전 건설에 드는 비용에 대해 얼마나 알고 있습니까?

- ① 매우 잘 알고 있다
- ② 어느 정도 알고 있다
- ③ 약간 알고 있다
- ④ 모르고 있다

23) 귀하께서는 풍력발전이 제주도의 전기 요금을 비싸게 만들 것이라고 생각하십니까?

- ① 네
- ② 아니오
- ③ 잘 모르겠다

기초 인구 통계

24) 귀하의 성별은 ()

- ① 남성
- ② 여성

25) 귀하의 연령은 ()

- ① 19 세 - 29 세
- ② 30 대
- ③ 40 대
- ④ 50 대
- ⑤ 60 대 이상

26) 귀하의 교육 정도는? ()

- ① 중졸 이하
- ② 고졸
- ③ 대학 (전문대포함) 재학 및 졸업 이상

27) 귀하 가정의 연간 가구소득은? ()

- ① 2 천만원대 이하
- ② 3 천만원대
- ③ 4 천만원대
- ④ 5 천만원대
- ⑤ 6 천만원 이상

28) 귀하의 직업은 ()

- ① 공무원 (일반직, 선출직, 교사 등)
- ② 전문직 (의사, 교수, 약사, 변호사, 건축사, 세무사, 성직가 등)
- ③ 제조업, 소상공인, 서비스업 (사무, 판매업 등)
- ④ 농·수축산업
- ⑤ 주부, 학생, 무직 등 기타

29) 귀하의 거주 지역은?

- ① 제주시 동지역
- ② 제주시 읍면지역
- ③ 서귀포시 동지역
- ④ 서귀포시 읍면지역

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