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Brownfield to Brightfield: Influences on Attitude

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BROWNFIELD TO BRIGHTFIELD: INFLUENCES ON ATTITUDE

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ABSTRACT

The purpose of this study is to analyze what factors influence a person's attitude towards a brownfield site converted into a future solar energy farm through the RE-Power America's Land Initiative to help increase the success of implementing solar energy farms in cities. Five different factors, including: spatial, public participation, local context, personal values, and socio-demographic factors are analyzed and tested using descriptive statistics and measures of association. Among other tests, measures of association were used to determine that egalitarian viewpoint, education and income had statistically significant relationships with acceptance towards the potential solar energy development. However, all of these influences are considered inherent characteristics and are not easily changed. Other factors such as familiarity and aesthetics also had a strong relationships with acceptance towards the potential solar energy development and are considered modifiable characteristics. Consequently, future policies and procedures in the RE-Power America's Land Initiative for Brisbane, California and Lackawanna, New York should focus on designing a cohesive aesthetic for the development and increase familiarity of the potential project by providing more information to the public.

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INTRODUCTION

This study analyzes what factors influence a person's attitude towards brownfield site conversion into a future solar energy farm through the RE-Power America's Land Initiative to help increase the success of implementing solar energy farms in cities. The Environmental Protection Agency (EPA), with the National Renewable Energy Laboratory (NREL) is encouraging renewable energy development on previous/current contaminated lands through the RE-Powering America's Land Initiative. This initiative is intended to eradicate multiple problems at once; namely to eliminate contaminated lands while simultaneously providing a new energy source. While the EPA and NREL are focused on converting multiple types of contaminated lands into an array of possible alternative energy sources, this study is concerned with brownfields converted into solar energy farms. These sites are colloquially known as brownfield to brightfield.

RE-Power America's Land Initiative appears to be a great approach to tackle multiple problems at once, but the public's reception is untested because it is a relatively novel project. To better understand the attitudes of people within the community, this study explored what influenced their attitudes towards a brownfield to brightfield site conversion. Having a better understanding of how local resident's attitude are formed can help tailor policies to encourage positive attitudes. Positive attitudes from local residents will help increase the success of the program because they will encourage, rather than hinder the project by showing support in public meetings. The ultimate objective is for the RE-Powering America's Land Initiative to be successful by effectively

producing energy and being integrated into the community, and tailoring policies based on people's attitude can increase the chance of success.

An overview of how the study will approach answering what factors influence people's attitudes toward a brownfield converted to a future brightfield in their local community through the RE-Power America's Land Initiative is as follows. The first task is to gain a knowledge base on the intersection between brownfields, solar energy farms and influences on attitude including spatial influences, public participation, local context influences, personal values and socio-demographics. Next, a survey was used to gather information on people's attitudes and influences on attitudes toward the proposed brownfield to brightfield site near their residence. Survey questions were created based on previous literature. Measures of association and difference of means tests were used on the data collected from the survey to analyze and determine which factors have more influence on attitude. Once the study has determined which influences affect attitude the most, this information can be applied to RE-Power America's Land policies to increase the probability of acceptance by the residents and increase the projects overall success.

LITERATURE REVIEW

The world's reliance on fossil fuels and the continuing contamination of the natural environment are some of the world's most pressing issues. Renewable energy sources provide a way to create new sources of energy and limit harm to the environment. Solar energy is a popular choice because of its universal abundance and its minimal negative

effects to the natural environment and the local community. The location of solar energy farms is an important consideration; RE-Powering America's Land Initiative is encouraging locating renewable energy developments on previous or current contaminated lands. Siting solar energy farms on brownfields provides an opportunity to clean the contaminated sites and put the land towards beneficial use. The same project can eliminate site contaminates, improve land market value, improve public health and improve the environment's health while simultaneously providing a new energy source.

Converting a brownfield to a solar energy farm, or brightfield, has particular requirements and challenges. The RE-Powering America's Land Initiative, managed by the Environmental Protection Agency (EPA) with the National Renewable Energy Laboratory (NREL), helps cities, developers and landowners maneuver through these unique challenges. They provide assistance with technical and programming, promoting polices and best practices, and partnering with stakeholders to strengthen networks and leverage funding. They have so far established 150 energy installations on 144 contaminated lands across the United States. However, this program does not appear to have considered the attitudes of local community members. Having a better understanding of these attitudes, and the factors that influence them, will help tailor policies so that people and local communities are more receptive to the project. The community's perspective is integral because it leads to collective agreement between citizens, groups and other stakeholders. Instead of examining collective agreement, this study will analyze individual person's attitudes and concerns to understand the variety of attitudes within the community.

Every person forms attitudes based on multiple factors. These influencing factors occur constantly, both consciously and unconsciously. Subconsciously, every individual takes into account their past, their values, their location and events to construct their own perspective of a situation. Factors influencing this construction of perception range from proximity to public participation to local context to values to socio-demographics. These influences, in addition to attitudes and views of brownfields and solar energy farms, can influence an individual's perception of the brownfield to brightfield sites within their community.

Ultimately, the goal of this study was to determine what factors influence people's attitudes towards a brownfield being converted into a future solar energy farm within their local community through the RE-Powering America's Land Initiative. To obtain a comprehensive background on this question, multiple fields of literature were studied. First, it is important to understand the basic facts about brownfields, solar energy farms and brownfield to brightfield sites in order to increase their successful integration into the community. It is then necessary to analyze attitudes towards brownfield redevelopments and solar energy sites separately because this information will provide an idea of how people will perceive these developments when integrated into one project. Since there is not a lot of literature on the specific attitudes towards brownfield to brightfield sites. A person's attitude regarding environmental issues may act as a proxy, revealing the factors that are likely to impact attitudes towards brownfield to brightfield sites.

REDEVELOPING BROWNFIELDS

Every community within this study contains a brownfield site. While each site has their own unique conditions, each site meets the Environmental Protection Agency's brownfield definition of "real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant" (Environmental Protection Agency website).

It is important to understand the actual costs and benefits of redeveloping a brownfield site and the effects on the community. Most literature focuses on how brownfields negatively impact the community by diminishing public health, environmental health and property values while increasing the disproportionate adverse impacts on marginalized groups. Because of their adverse effects, brownfield mitigation and redevelopment are critical to aid community development. Unfortunately, brownfield mitigation and redevelopment is costly, and specific strategies must be carefully considered.

Brownfield redevelopment should be tailored to accommodate the site and the community's goals. Keeping the cleanup and redevelopment process flexible so it can be tailored has both positive and negative implications. Flexibility provides the ability to tailor the clean-up process and redevelopment to the sites specific characteristics (Kass, Bridgen and Lee, 1998). For instance, the specific environmental and health goals for the site will dictate the amount of cleanup conducted. However, flexible processes result in more time and resources expended, such as data collection to ensure that the process functions well

for the specific site (Thomas, 2003). Some of these resources include partnerships with the community, government agencies and the developers. Building these relationships takes a lot of time and effort. For each site, there should be a discussion about balancing goals with expended resources.

Not only do these relationships take a while to build and the data take a long time to gather, there is a lot of uncertainty involved with brownfields. There is scientific uncertainty in regards to the required cleanup levels for a particular site, which can leave it with contaminates that impact its new use (Eckerd and Keeler, 2012; Kass, Bridgen and Lee, 1998). Liability is another uncertainty with brownfields because previous and current landowners could be liable for the cleanup costs. However, there are precautions one can take to decrease the possibility of liability, including comfort letters or prospective purchaser agreements (Kass, Bridgen and Lee, 1998). Even though tackling the brownfield project can seem like a daunting task with many hurdles, once it is completed the project can provide community benefits.

There are environmental and health benefits to the cleanup of pollutants and contaminates. It was suggested that in Cook County, Illinois, the cleanup and the redevelopment of brownfield sites reduced the occurrence of 10 cancer cases within a population of 10,000 people (Sustainable Brownfields Consortium, 2013). Therefore, cleaning brownfields can help improve quality of life by reducing sickness in the area (Eckerd and Keeler, 2012). Brownfield cleanup can also reduce the perception of getting sick from the site

contaminates, which can increase land values and the likelihood of development in the area. In Atlantic Station located in Atlanta, Georgia, the reduction of contaminants and redevelopment of the site doubled the amount of walking in the area. Similar sites have also experienced an increase of walking, bicycling and transit use from brownfield cleanup and redevelopment (Sustainable Brownfields Consortium, 2013). In order for the actual and perceived risk to remain low, the new use cannot re-contaminate the site. Proper precautions should be taken to ensure the site does not become contaminated again (Neuman and Hopkins, 2009; Healey, 1997). Therefore, site cleanup helps decrease actual and perceived risk, but these benefits will only remain as long as the new use does not contaminate the site.

Another benefit of brownfield cleanup and redevelopment is reducing the disproportionate adverse impacts on marginalized groups. Brownfield sites tend to be located in close proximity to lower socioeconomic and/or minority communities (Eckerd and Keeler, 2012; Hamilton, 1995; Campell et al., 2010; Pastor et al. 2001; Rinquist, 2005). There is a "chicken or egg" debate among scholars, about whether the contaminated sites were there first, or the communities themselves. The question for many researchers is whether the remediation process for brownfields located in these communities are treated differently than other sites, which would indicate a potential environmental justice issue. Eckerd and Keeler (2012) reported that the highest predictors of site cleanup and the expediency of the process are the characteristic of the site and proximity to other brownfield sites, not income. In other words, sites that are more environmentally risky receive cleanup priority (Eckerd

and Keeler, 2012). However, they did find some inequity in minority communities; in particular, communities with a larger Hispanic or black population tend to experience a slower remediation process. These findings are not consistent throughout all studies. For example, brownfields in lower socioeconomic and minority communities near Detroit were given a higher cleanup priority (Lee, 2008). No matter the cleanup priority, redeveloping these sites indicate an economic rebound within the community which can either improve the quality of life for the current residents, or force them to leave because they can no longer afford to live in the community (Lee and Mohai, 2012). Therefore, brownfield remediation can reduce contaminates near marginalized groups, but the ultimate outcome for the community can differ.

As with other redevelopment sites, former brownfields have the potential to generate a wide range of benefits to the site and to the adjacent community. These benefits usually include increased property values, increased jobs and increased tax revenue. The specific benefits are dependent upon the land use. Property value effects tend to be most the profound on sites that already have a strong economy within the city. Property values increase because land restoration the land signals an economic rebound to private investors and the community (Sustainable Brownfield Consortium, 2013). Effects on property values are highly localized and the highest impact generally occurs within 1,500 feet of the site (De Sousa, Wu and Westphal, 2009; Watkins, 2010). The exact effects on property value are highly varied and are usually determined by the use of the site, which is standard for land use. When examining the net benefits of sites in Milwaukee and Minneapolis,

commercial and park uses had the most substantial net benefit; industrial sites, such as energy factories, had less of a net benefit (De Sousa, Wu and Westphal, 2009). However, industrial and commercial uses usually yield the most jobs with an average of 10.4 persons per acre (Howland, 2007). The majority of new jobs produced from the redeveloped sites do not necessarily go to those in the immediate community but rather go to new residents or 'in-migrants' due to a mismatch of skills (Lee and Mohai, 2012; Howland, 2007). Local employment is more likely if the available jobs match the skills of those in the local community. Employment affects the individual, their family, and the entire city by increasing the tax base; each job increases the tax base on average by $5,470 annually (Howland, 2007). Therefore, as the number of jobs increase and the property values increase, so does the tax base. The increased tax base helps to increase net migration in the neighborhood and increase revenue for government programs that further assist the community, creating a circular effect (Sustainable Brownfield Consortium, 2013; Howland, 2007). Different uses have a differential impact on property value, employment and revenue for the city.

Site redevelopments also have the benefit of aiding in the reduction of sprawl. By redeveloping former brownfields, the site's existing infrastructure can be re-used instead of developing new infrastructure in greenfields on the edge of a city. This strategy is a very effective means of implementing smart growth principles by keeping developments centralized (Greenberg et al., 2001). Finding the appropriate site that contains the necessary infrastructure and utilities for a project can help save time (Johnson, 2010) and money for

cities and developers during the development phase (Doresy, 2003). By redeveloping brownfields, money is not only saved on building infrastructure but is also helps reduce the size of the city.

Redeveloping brownfields can be very beneficial to the community. However, there is much less literature that specifically addresses the benefits of brownfields that are converted into brightfields. While the benefits should be similar, specific benefits to the community depend on the type of redevelopment. For instance, an increase of jobs and city revenue may be expected, but property values may not increase much with a solar energy development. Understanding the potential benefits of brownfield redevelopment may provide insight into residents' attitudes towards the site.

SOLAR ENERGY FARMS

Solar energy is first and foremost a way to expand the availability of energy resources (McDaniel, 1981). Various types and sizes of solar energy farms exist to accomplish this goal. The RE-Power America's Land Initiative implements both ground mounted photovoltaic and roof mounted photovoltaic. As opposed to comparing different types and sizes of solar energy developments, this study will analyze the general costs and benefits. There are many different factors to consider, including the initial installation cost, environmental and health benefits, externality effects to the environment and effects on city landscape. Generally, there are more benefits than externalities; Turney and Fthenakis (2011) identified 32 potential impacts of solar energy developments, and found 22 were

positive, 4 were neutral and 6 required more research. Understanding the specific effects of solar energy farms provides information on potential problems and methods to increase success.

Even though solar energy is the "least mature large-scale renewable technology," it has a lot of potential to mature and grow worldwide (Gauché, Brent and von Backström, 2014, p. 698). Solar energy is currently increasing at about 40% per year worldwide according to the European Photovoltaic Industry Association (EPIA) and, in 2006, provided about 10% of all energy worldwide (EPIA 2010; Balat, 2006). Solar energy has potential because the sun is an abundant and evenly distributed resource (Sen, 2004). Technology is starting to allow for solar energy farms to be up to 32% efficient and at noon on a clear day produce about 1,000 Watts per meter squared (IEA, 2001). As technology matures, efficiency should only increase. Efficiency is also affected by distance from the equator, angle of the solar panels, the season and the weather (Lakatos, Hevessy and Kovács, 2011; Gauché, Brent and von Backström, 2014). Radiation is strongest in the middle of the day and between May and September, with June being the most optimal month in the northern hemisphere (Lakatos, Hevessy and Kovács, 2011). Since there are certain times during the year with excess radiation and certain times with minimal radiation, long-term storage becomes necessary for constant supply. However, technology is not quite up to meeting long-term storage needs. Solar energy has the potential to continually provide a larger share of energy needs, but technology still needs to improve before it can consistently provide energy throughout the entire year.

Solar energy farms can benefit the environment and public health, but there are possible negative consequences. The environment benefits because solar energy is a clean energy source that does not require the extraction or contaminating the environment during the production process (Gunerhan, Hepbasil and Giresunlu, 2009). Specifically, there are minimal air emissions and waste products from the production of solar energy (Tsoutsos et al., 2005) and little noise emitted from the equipment (Turney and Fthenakis, 2011). However, risks to the environment still exist. There is potential for contamination through irregular plant operations and accidents such as fires, which can release chemicals into the environment (Tsoutsos et al., 2005). Damage to the environment is worse in sensitive areas, such as the desert, which is where most solar energy farms tend to be located (Tsoutsos et al., 2005). Most of the contamination occurs before the solar farm is operational. Construction disturbs the soil and surrounding environment (Turney and Fthenakis, 2011). The manufacturing, disposal and transportation of the materials needed, such as batteries, can produce negative externalities for the environment (Gunerhan, Hepbasil and Giresunlu, 2009). Leaks from batteries, heat transfer fluid and coolants can contaminate soils and nearby water sources, adversely affecting human health (Tsoutsos et al., 2005; Gunerhan, Hepbasil and Giresunlu, 2009). Contaminating the soil can reduce the productivity of the soil and ruin species habitat. Species can also be impacted by panels creating a local island heat effect, affecting the thermal balance and harming productive areas (Gunerhan, Hepbasil and Giresunlu, 2009). Conversely, the shade from the panels can also provide a microclimate for some plants to thrive (Tsuoutos et al., 2005). Therefore, the specific

location and environment will determine the extent of the solar panels effects on habitats. Other species such as birds and insects can be burned or experience impact trauma, but this is a very small percentage (Kagan et al., 2014; OECD/IEA, 1998). Consequently, the possibility of adverse effects on the environment and human health is possible, but it is less than the reoccurring adverse effects of other energy sources.

Solar energy farms have a social effect on the community and their presence can alter the character of the area. For instance, solar energy farms have a visual impact which can burden people's psyche (Gunerhan, Hepbasil and Giresunlu, 2009). However, visual impact can also have a positive impact on the community and will be discussed in subsequent section entitled G*eneral Attitudes towards Brownfield and Solar Energy Farms.* Compared to other energy and industrial sites, there is minimal noise and vibrations that affect the community from solar energy. Slight noise may occur during the day, but there is no noise at night, which is when most people are more likely to notice and/or complain about it (Tsuoutos et al., 2005; Balat, 2006). Besides the physical structure, solar energy can have a positive impact on recreation within the area. Solar energy farms do not emit mercury into the environment, like other energy sources, which can improve their usefulness for recreation and fishing (Turney and Fthenakis, 2011). Solar energy farms effect the community and these effects are mostly positive, but visual impact can be considered negative.

As with any development, there are positive and negative economic impacts. There are high initial development costs because the production of photovoltaic (PV) cells require a large quantity of materials (Tsuoutos et al., 2005; Gauché, Brent and von Backström, 2014; McDaniel, 1981; Topcu and Ulengin, 2004). It costs about $5,000 to $7,000 per kilowatt peak (kWp) for PV systems, according to the IEA's PV Power Systems Programme. Once the development is operational, the cost per unit is low. Solar energy's target cost is US$0.06/kWh whereas, conventional energy generally costs about US$0.05-.10/kWh to produce (Kolb et al., 2011). Therefore, solar energy can cost less than most conventional energy facilities to produce energy. Researchers are continually attempting to increase production efficiency and decrease production prices. Another major aspect of economic impact is job creation. The specific number of jobs produced depends on the development process and whether the materials and technology is manufactured locally (Akella et al., 2009). The number of jobs is comparable to fossil fuel energy source productions (Turney and Fthenakis, 2011). Ultimately, solar energy farms bring jobs into the community, but the amount of jobs and other economic impacts highly depends on the context of the situation and the location.

The proximity of solar energy sites to one another is important. If the groupings are too close, there can be a substantial under or over production of energy due to weather conditions (Gauché, Brent and von Backström, 2014). By spreading the sites out from one another, the sites can compensate for one another if a specific region is experiencing inclement weather. This can be problematic when trying to develop solar energy panels on

brownfields since brownfields are usually clustered around one another. Therefore, the site location needs to be strategic and additional lands may need to be used to supplement areas that lack brownfields. It is possible that the EPA, NREL and the municipality may need to coordinate and discuss possible options to supplement brownfield siting.

Solar energy farms generally have a positive impact to the environment, community and economy. However, there are negative impacts, which include environmental contamination and visual impacts. A majority of the literature on brownfields and solar energy sites addresses these issues separately. The next section reviews the much smaller set of sources that consider solar energy development on previous brownfield site.

BROWNFIELD TO BRIGHFIELD SITES

Brownfield to brightfield sites have a few unique set of impacts and factors to consider since development is being constructed on previously contaminated land. If handled correctly the sites can produce large economic benefits. In Michigan, they are transforming brownfield sites for solar and wind energy, which could accommodate for "43% of Michigan's residential electricity consumption" and "include over $15 billion in investment and 17,500 in construction and long-term jobs" (Adelaja et al., 2010, p. 1). One site in Brockton, Massachusetts has generated approximately $145,000 annually for the city. Brownfield to brightfield sites are distinctive because they not only provide economic benefits, but also address three of the most important issues in the United States: urban revitalization, climate change and toxic waste cleanup (Johnson, 2010).

Brownfield to brightfield sites presents a challenge because one needs to consider funding, zoning, liability, performance risk, resource risk, market risk, technology and regulations in order for each unique situation to be successful (Johnson, 2010: Neuman, 2009; Sampson, 2009). Sites should be located close to pre-existing infrastructure and utility lines to easily transmit power created from the solar energy farm (Johnson, 2010). It is also imperative to verify that soils are stable and settled, which can be a reoccurring problem among some brownfield sites (Sampson, 2009). If the soil is not settled, then certain accommodations need to be made so that the technology is not compromised and the electricity production does not lose efficiency. Other factors to consider are vibrations and heat/dehydration of soil from solar damaging the concrete cap, possible pollution releases and technology failures caused by other mitigating factors (Sampson, 2009). Taking into account these unique factors of developing a solar energy site on a brownfield will help gain a better understanding of the process. Studying the sites requirements is important because if these projects fail, then the public's attitude towards the project will most likely sour.

GENERAL ATTITUDES TOWARDS BROWNFIELD AND SOLAR ENERGY FARMS

Understanding attitudes toward brownfields and solar energy farms is important because it can affect people's acceptance of a brownfield to brightfield project in their community. Before a discussion of general attitudes can begin, attitude needs to be defined. Attitude is a broad concept and is generally understood as a way of thinking or feeling about someone

or something. For this study, the definition of attitude is “a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor” (Eagly and Chaiken, 1993, pp. 1). Essentially, attitude is how an individual processes an idea, object or person. There are three main components of attitude: affective, behavioral and cognitive (Rosenberg and Hovland, 1960). The affective component involves the person’s feelings and emotions. The behavioral components relates to how attitudes affect action and behavior and the cognitive component pertains to a person’s belief or knowledge about the object. However, empirical research has failed to distinguish clear separations of these three components (Eagly and Chaiken, 1998). This study relied on self-reported measurements of attitude and will address all three components of attitude as a whole to get a holistic picture of a person’s attitude towards brownfield to brightfield sites.

Literature is scarce on exact attitudes toward brownfield to brightfield sites, possibly because this type of project is specific and still relatively novel. To get an understanding of attitudes towards these sites, attitudes towards brownfield redevelopment and solar energy farms were examined separately to predict attitudes towards brownfield to brightfield sites. While brownfield redevelopment and solar energy farms are different projects, they both follow similar patterns of how people perceive them.

Attitudes toward brownfield redevelopment and solar energy farms are generally positive but these attitudes are contingent on various factors. Brownfield redevelopment is “embraced by virtually all stakeholders, including bankers and developers, community

development groups, neighborhood residents, business owners and federal, state and local governments" (Solitare, 2005, p. 918). It is embraced because it addresses urban revitalization, social welfare, economic solutions to urban problems and environmental health (Letang and Taylor, 2012; Johnson, 2010). When brownfield redevelopment is perceived as beneficial on multiple fronts, it is more likely to be accepted by a wider audience.

Renewable energy is typically supported over nuclear energy and other fossil fuel energy sources; solar energy tends to be the most popular type of renewable energy because it is perceived to have the least amount of negative externalities (Greenberg, 2009; Reiner et al., 2006; Tampakis et al., 2013; Steel et al., 2015). However, support for the concept of solar energy is very different than being involved with the production of solar energy. For instance, while there was high support for a local solar energy site, there was little enthusiasm for being involved in the project (Rogers et al., 2008). Hence, solar energy is generally accepted because of its perceived benefit, but those attitudes can alter based on personal cost of implementing that type of energy.

Acceptance of a project can help indicate a positive attitude towards a project. It is important to remember that acceptance does not appear in one form. In fact, there are three different dimensions of acceptability: socio-political, community and market (Wüstenhagen et al., 2007). Socio-political acceptability is the broad acceptance and the key stakeholders' ability to create policy. Policy can be hindered if the community does

not accept the project and agree with policy decisions. Community acceptance involves the extent of stakeholder investment, how costs and benefits are shared and the decision process. Market acceptance is the relationship between producers and consumers. Sovacool and Ratan (2012) expanded upon this concept and determined nine factors that affect these three dimensions. For this research, factors pertaining to community acceptance were the focus because this study pertains to local resident's attitude towards the site. The three factors of community acceptance are "prolific community/ownership use, participatory project siting and recognition of externalities or positive public image" (Sovacool and Ratan, 2012, p. 5271). Community acceptance is affected by the following: whether energy systems are used locally, whether the community is involved in the decision process and whether the community is aware of the benefits of renewable energy.

It is theorized that community acceptance can have an impact on the implementation of solar panels. According to Sovacool and Ratan (2012), the United States lacks consistent regulations that addresses community acceptance and this could be influencing the limited implementation of residential solar panels within communities. Implementation could also impacted by the high costs of the panels and utilities in addition to acceptance. However, once the technology matures, the cost of the technology should decrease and become more accessible (Gauché, Brent and von Backström, 2014). In Sovacool and Ratan's (2012) study they concluded that there is a combination of factors within the United States that could be limiting the opportunity for a person to become familiar and educated about solar energy and their benefits. These factors include the United States utilizing mainly large

centralized solar energy farms to generate solar energy, decisions are left to the "experts, technicians and bureaucrats" and there is a lack of acknowledgement and education of solar energy (Sovacool and Ratan, 2012, p. 5274). It has become the norm to let professionals handle solar energy and not get involved or educated. By the parameters in this study, the United States lacks community acceptability and the opportunity to increase acceptability of residential solar panels. Even though Sovacool and Ratan (2012) studied residential solar panels, their research helps to explain why solar energy farms are more widely practiced and more accepted than residential solar panels in the United States. Their methods could be used to break down community acceptance of solar energy farms.

Acceptance and attitude can be influenced by trust, perceived cost, perceived benefit and visual impact. It is important to retain public acceptability because the lack of acceptability "often poses a threat to renewable energy development" (Devine-Wright, 2005, p.125). Acceptability does not exclusively pertain to renewable energy, but pertains to other site projects such as brownfield redevelopment. Trust is specifically important for acceptance because trust is related to higher levels of support towards solar energy and brownfields (Carlisle, et al., 2015; Visschers and Siegrist, 2014). In regards to brownfields and solar energy, trust was connected to perceived openness, motivations, flexibility and open mindedness of the council members and other stakeholder's (Eiser et al., 2007; Wüstenhagen et al., 2007). Intentions of fairness and knowledge of the process/site is what gained the trust of the communities. Maintaining trust is imperative because it is very difficult to regain if lost. Trust can have other impacts on acceptance and attitude. For

instance, trust tends to influence and inform people's attitude towards costs and benefits of a project because they have limited knowledge of the actual externalities (Siegrist and Cvetkovich, 2000). Trust is important because most people use it to construct their attitudes.

Perceived costs and benefits influence peoples' attitudes towards brownfields and solar energy. Visschers and Siegrist (2014), found that perceived benefits had the strongest relationship in relation to accepting solar energy farms and other renewable energy sources. Therefore, understanding a person's attitudes towards the costs and benefits of a project will provide useful insight into their overall attitudes. Depending on a person's goals for the project, they will focus on different costs and benefits. For instance, municipalities will view a project through an economic lens (LeTang and Taylor, 2012). Is the project bringing in revenue for the city? Will it attract new residents and jobs to the community? Developers also look at the financial aspects of the project and tend to not perceive brownfield redevelopment as cost-effective, which can prevent them from looking into a brownfield project (De Sousa, 2000). Citizens also focus on the overall cost and how it influences property values. Carlisle et al. (2015) found that people who thought solar was more expensive than other forms of energy were less likely to support it. This shows that perceived cost has a strong influence on people's willingness to support it. Carlisle et al. (2015) also reported that 70% of people in their national study believed that large-scale solar would decrease their property values. People also believe that brownfields will decrease their property values; in some cases, perceived risk can actually lead to people

fleeing the community, causing property values to drop (Messer et al., 2006). Financial cost and benefits tends to dominate municipalities' and developer's attitude towards a project, but it also influences citizens, just not to the same degree.

Citizens focus on more than economic value, they also look at how the project will affect their quality of life. Letang and Taylor (2012) stated that environmental aesthetic was the most important reason for a person to approve of a brownfield redevelopment in their areas, followed by health and safety. Therefore, in order for solar energy sites to be accepted by the community, the project will need to be aesthetically pleasing. Solar energy sites do not inherently look natural or aesthetically pleasing in the large open area sites required to access sunlight. Therefore, design choices should help reduce intrusion of the natural environment as much as possible (Torres-Sibille et al., 2009). There are three aspects of solar energy sites that have the most impact on visual aesthetics: color, fractality of the panels and atmospheric conditions (Torres-Sibille et al., 2009). If these three aspects work together to blend in with the natural surroundings, then the public is more likely to approve of the site. If the site is not cohesive with the community, it is more likely to be rejected because it brought a negative change, especially for a person whose self-identity is attached to the place (Letang and Taylor, 2012). However, not all communities perceive aesthetics as important, in the Southwestern United States, "spoiling" the scenery was not a significant factor in citizen's attitude (Carisle et al., 2015). To be proactive, it is important to receive input from citizens regarding the design of the solar energy site because it can help reduce the negative effects associated with disapproval of the site, including the

disruption of social cohesion (Moore and Hackett, 2016). It is plausible that solar energy sites will not be held to the same aesthetic requirements as other brownfield redevelopment projects because they are industrial sites that bring jobs. Ruelle, Hallaux and Teller (2013) found that people are more accepting of uglier sites if they are associated with jobs, but that perspective does not last over the long-term; long-term was not specifically defined in this study. Over the long-term, attractiveness is correlated with economic value so over time people will no longer associate the solar energy site with jobs, but rather with decreasing the economic value of the site and the adjacent community (Halleux, 2005). Even though solar energy sites represent jobs and some people may forgive the ugliness of it, design and landscaping need to be highly considered because they have a great impact on the overall cohesion with the community and the long term perspective of the project.

The literature on attitudes towards brownfield redevelopment and solar energy farms independent of one another is ample. However, to understand the attitude towards brownfield to brightfield sites, one cannot just combine literature on attitudes towards brownfields and towards solar energy farms because a brownfield to brighfield site has its own unique set of factors. While it would have been useful to have studies on attitudes towards brownfield to brightfield sites, there is little available. This study helps fill that void by analyzing attitudes towards brownfield to brightfield sites. Additionally, this study seeks a better understanding of the most predominate influences that affect attitude. Literature from various disciplines were used to gain a more comprehensive view of

internal and external factors that could influence attitude and will be discussed in the next section of the literature review.

INFLUENCES ON ATTITUDE: SPATIAL

Literature has explored external and internal influences that affect attitude. While comparing various studies with accuracy is not possible (Markle, 2013), reviewing studies can suggest broader themes on the influences of attitudes. Spatial influences, public participation local context, values and socio-demographics are commonly studied and were discussed in this study. Then, these influences were studied using a survey.

Spatial proximity will inherently be a factor with all influences on attitude because this study focuses on persons within close proximity to the project site. Spatial proximity influences attitude because it increases exposure to the site, which increases the amount of impact the site has on a person. There is a general consensus within the literature that proximity has a major impact on attitude, but theories vary as to why and how proximity affects attitude. The debate revolves around NIMBYism versus place attachment.

Proximity

Proximity to the site influences one's attitude. Proximity can pertain to distance or exposure; it is usually assumed that distance affects the amount of exposure. However, actual distance does not guarantee exposure or determine 'perceived distance'. It was suggested that perceived distance is more indicative of attitude, but it is harder to measure

(Devine-Wright, 2005). However, some characteristics can inform perceived distance. For example, physical barriers such as roads can impact perceived distance and overall attitudes towards the brownfield to brightfield site on the opposite side of the physical barrier (Anciaes, Jones and Mindell, 2014; Bradbury, Tomlinson and Millington, 2007; Social Exclusion Unit, 2003). While a simple concept, proximity is rarely consistently and thoroughly defined. Every study tends to use a different distance, depending on their justification. For instance, when studying different energy source attitudes, Greenberg (2009) used a 50 mile radius to purposefully decrease the percentage of those knowledgeable of the site to about 20%. The intention was to remove bias from the nuclear power plant by extending the radius. While Greenberg (2009) concluded that proximity does not have an effect on attitude when comparing survey responses from within 50 miles of the site to a national sample, these results should be cautioned because the site specific responses did not contain a large percentage of people who are familiar with the site. Therefore, the study does not compare knowledge of a specific site to general knowledge. For the purposes of this research, having a greater percentage of resident's awareness of the site is essential to understanding how it affects attitude towards the site; therefore a smaller radius of 1,500 feet was used.

Studies have conflicting results to whether and how proximity affects attitude. These results can differ based on the site typology, land use and distance. It is difficult to compare studies directly so they must be looked at independently to fully understand their results. Sites that have a lower perceived risk are usually studied with a smaller radius because

their impact is believed to affect a smaller population. For instances, brownfield redevelopment studies usually remain within 1 mile of the site. De Sousa, Wu and Westphal (2009) studied multiple radiuses within a 1 mile radius to understand economic impact of brownfield redevelopment and was discussed in further detail earlier in the study. Whereas, a 20 kilometer radius was used to study wind farms because it was suspected that the attitudes would be and have a larger impact on the community (Warren et al., 2005). Devine-Wright (2005) proposed a 'proximity hypotheses, residents that are closer to wind energy farms would have more negative perspectives. However, many studies have proven this hypothesis incorrect. Studies have determined that closer proximity to wind farms correlate with positive attitudes; it is theorized pride and environmental symbolism are at the root of these positive attitudes (Warren et al., 2005; Braunholtz, 2000).

Proximity is thought to affect attitude because it increases personal exposure. Exposure creates familiarity with the site, which can become a symbol for the community. It is suggested that proximity personalizes the risk of the site (Zhang et al., 2010) and more overt sites increase risk perception since it is seen more frequently and is therefore constantly on the mind (Brody et at., 2008). This personalization could be an explanation for why Brody, Highfield and Alston (2004) found that those within closer driving proximity had more accurate information on the natural environment and health of the site. Visual reminders of the site are strong influences on public attitude (Wolsink, 2000; Pasqualetti et al., 2002) and these influences can be both positive and negative. In fact, there were twice as many positive visual reactions to negative reactions in a study of wind

farms. Even if people did not like the aesthetics, they found the environmentalism symbolism welcoming with solar or wind energy farms (Warren, 2005). Therefore, the more visually obvious sites will have a greater impact on attitude, whether positively or negatively. Proximity has an effect on attitude but the severity of influence is dependent on the amount and type of exposure, not just distance.

NIMBYism

If it appears that a site or development can affect an individual's home, then he or she tends to have a strong reaction. By nature, humans feel protective of their homes and their communities. Therefore, people are opposed to any perceived adverse site or development within their community purely because it is nearby and may produce a negative effect; this is the reasoning behind not in my back yard (NIMBY). NIMBY has become a popular concept; stakeholders and some scholars automatically attribute the source of opposition to any new developments within their community to the NIMBYism movement. However, that may not be an accurate assessment. Some scholars have proposed that labeling the opposition as NIMBYism simplifies and dismisses the situation without truly understanding the core nature of the opposition's argument (Smith and Marquez, 2000). Using the NIMBY label has even been described as 'lazy' by Wolsink (2006). It was suggested that pro-development organizations will use the NIMBY label to undermine the opponent's argument to make it seem self-centered (Haggett and Smith, 2004). NIMBYism is not the only reason for opposing development. In a study conducted by Smith and Marquez (2000) on reactions to offshore development, distrust was at the core of their

negative perception not NIMBYism. Therefore, a greater understanding of the situation is necessary to understand the true attitudes and motivations of the community before labeling and dismissing the opposition as NIMBYism.

While every situation is unique, there are three core arguments behind NIMBYism for objecting the development: perceived threat to property values, personal security and neighborhood amenities (Dear, 1990; Dear, 1992). All three of these arguments center on fear of neighborhood decline from the new development. With contaminated sites and large industrial sites, residents generally oppose the visual and perceived effects to the environment and to public health (Wakefield and Elliot, 2000). Residents often prefer their neighborhoods to remain constant. Residents of rural areas are particularity predisposed to oppose change because they moved to the rural communities for a reason, such as living in a quiet and never changing place (Wakefield and Elliot, 2000). Also, changes within rural communities are perceived to be greater than changes in the urban environment because rural environments are more homogeneous and urban environment experience more turn-over (Dear and Taylor, 1982). Therefore, opposition increases as the perceived amount of alteration to the community increases. For instance, larger facilities tend to bring more opposition because it alters the community more than a small business (Dear, 1992). NIMBY arguments are influenced by many factors and understanding these specific factors and motivations provide greater insight to their true attitudes on the situation.

Place Attachment

Place attachment is an alternative method to understand motivations behind approving or opposing a site or development within the community. The theory is that the stronger emotional connection or 'place attachment' someone has with a place, the more likely they are to defend it when there is a perception of risk. Place attachment does not just happen, it is an emotional and self-regulatory process. Individuals usually seek out specific types of natural locations and community types which helps to strengthen their attachment of their residence and to the community (Korpela et al., 2009). During the process of becoming emotionally attached there are certain factors that have more of an impact. Place attachment correlated with length of residency, home-ownership, strength of perceived cohesion and low perceived incivilities (Brown, Perkins and Brown. 2004). One of the more influential predictors of place attachment is length of residency (Brody, Highfield and Alston, 2004). Longer residency in one place provides more time to increase one's knowledge and awareness of physical attributes within the community and environment (Cantrill, 1998). Time is important because it provides the opportunity to develop a strong attachment through memories, history and social connections (Scannel and Gifford, 2010). Therefore, communities with long-term residents are most likely to develop high levels of their place attachment and influence their attitudes on a project affecting the community.

If a new development threatens to alter their community, place attachment can invoke place-protective behaviors (Williams and Patterson 1996; Stedman, 2002). Place-protective behaviors are not inherently in opposition of a project, even though most studies look at negative place attachment reactions and opposition to the change. In fact, place

attachments are complex and have a mix of both positive and negative emotional responses (Manzo, 2005). Therefore, strong place attachment can either motivate support or opposition to a project, depending on the context (Takahashi and Selfa, 2015; Theodori, 2004). How the change is perceived is more important than the change itself (Devine-Wright, 2007; Nash et al., 2009). For instance, the solar energy farm could bring meaningful and valuable benefits to the community and not invoke negative attitude (Devine-Wright, 2009). Even though understanding place attachment is important, not all studies found place attachment to be predictive of involvement in decision making processes (Scannel and Gifford, 2010). While not all studies found that place attachment affect attitude, mostly due to disagreement on definition, there is enough reason to believe that place attachment is a reasonable motivator for involvement.

There are many studies that describe the relationship between proximity and attitude or perception using differing theories such as NIMBYism and place attachment. Even though there are a lot of studies that research real distance, they all use different distances, sometimes without a justification. Also, there are very few studies that include perceived distance in their analysis. This study focused on a smaller fixed distance, 1,500 feet, and incorporate an element of perceived distance, a physical barrier, to include the influence of perceived distance within this study.

INFLUENCES ON ATTITUDE: PUBLIC PARTICIPATION

Public participation has increased in popularity because the original 'decide-announce-defend' approach was not getting support from the community. Scholars, and other stakeholders, realized how the public participation process affected attitudes towards renewable energy sources and how gaining consent from the public was an influential factor (Walker, 2010; Devine-Wright, 2004; Firestone et al., 2012). Public participation is part of the democratic process where interested members of the community and other stakeholders actively engage on a specific issue to reach a decision. It provides an open forum where viewpoints can be expressed and ideas considered.

Using consensus building during public participation is valuable because it provides a method to form a decision on controversial issues when there are multiple stakeholders (Innes, 1996). However, consensus building can actually generate disconnects between the preferences of the community and the goals stated post-consensus building since compromises need to made during the consensus building process. Therefore, the consensus building process does not guarantee that the preferences of the community were directly incorporated into the proposed development plan. To further illustrate the disconnect between the preferences of the community and the implementation of the development plan, Loh (2012) highlights four places within the planning process that increases disconnect. The first disconnect happens during the visioning process and consensus building stage because compromises need to made to appease the sheer number of stakeholders (Loh, 2012). Second, disconnect occurs when the Planning Commission and the planners turn the stated goals into a written plan. In the plan writing stage, the

planners could misinterpret, disagree with the community's goal, poorly write or discover that goals conflict with one another (Loh, 2012). Third, the plan could be further altered to fit within current zoning, other ordinances, and by the political climate (Loh, 2012). The last disconnect occurs during the enforcement of legislation that implements the plan by deciding how aggressively the city will pursue violators and that correlated with the effectiveness of the plan (Loh, 2012). Therefore, even if the planning process functions properly and all groups are represented, there can still be disconnect between the original community preference and the outcome.

Even though public participation provides an opportunity for all persons to participate, it does not guarantee that all groups in the community were represented; in reality, selective participation usually occurs (Rydin, 2000) because of barriers or preconceived attitudes towards the process. For instance, an individual is unlikely to participate alone because he or she will have less impact and the effort outweighs the impact. A small group will have a larger impact and therefore the benefit of participating starts to exceed the cost (Rydin, 2000; Olson, 1965). This is an example of public choice theory, in which individuals expect the benefits of their participation to exceed the cost of their time and resources. Therefore, the benefits of participation and learning how to increase the impact of people's voices should be emphasized to the public to help encourage participation (Laurian, 2004). Altering preconceived attitudes toward the process is interesting literature but was not the focus of this study. Instead, this research focused on how attitudes are impacted by the public participation process and barriers to participation.

Impacts of Public Participation:

When executed properly, public participation can positively impact the community's attitude towards the issue by increasing the trust and buy-in of the institutions and technology (Brody et al. 2003). Trusting institutions can be encouraged through open communication, access to knowledge, objective arguments and public involvement from the beginning (Wakefield and Elliot, 2000; Eiser et al. 2007; Brody et al., 2003). By incorporating the pubic into early planning decisions, it is more likely that the people will accept the decision because they feel that they have been treated fairly (Solitare, 2005). In addition to generating trust, the process helps to increase social capital and credibility of the institutions, which can lead to the locals being more invested in the process. When invested, locals are more likely to lend their valuable local knowledge and commit to creating innovative resolutions (Brody, 2003; Laurian, 2004). Overall, participation empowers citizens by giving them a voice to affect change, which increases their pride within themselves and in their community (Zimmerman and Rapport, 1988; Wakefield and Elliot, 2000). This empowerment and pride generated from participation should increase their buy-in of the project in their community.

However, the decision making process can create negative effects. The process can actually have a greater impact on the public then the outcome of the decision, especially when the process is not handled correctly (Elliot et al., 1997; Elliot, 1998). For instance, public participation adds time and costs to the planning stages, which then delays the project and

could automatically start creating contention (Brody, 2003; Solitare, 2005; Wakefield and Elliot, 2000; Tonn et al., 2000). Also, the process could be considered unfair and cause resentment unless all stakeholders are present and equally represented as Innes (2002) suggests. Uncertainty regarding the process can also cause resentment. It is proposed that the uncertainty of the process can actually cause more stress and negative psychological effects then the outcome (Wakefield, 2000). Some participants start to resent the time and energy that participation requires because it becomes a more extensive process than they perceived or the process intended (Wakefild and Elliott, 2000). It is especially frustrating when the process takes longer when they are having difficulty in reaching consensus, which is the risk with any planning process (Rydin, 2000). It may increase the chances of the participants becoming complacent and settling for a method that will not be as effective in achieving their goals for the project (Solitare, 2005). Therefore, the process would have produced a poor decision and increase frustrations, which could then negatively affect their attitudes toward the project. Even if consensus is reached, it is possible that implementation does not occur because of inadequate resources or failing to assign responsibility for necessary actions (Rydin, 2000). It is also possible that implementation occurs, but the outcome does not coincide with the original vision of the community and creates resentment due to the disconnect (Loh, 2012). After all their efforts, it is understandable to resent the project when setbacks occur. Any of these setbacks can cause frustrations and resentment of the process and those feelings will most likely transfer to the project itself. Therefore, it is imperative that the planning process is handled correctly to not accidently create negative feelings and attitudes.

Motivations and Barriers of Participation

Having the ability to participate will innately factor into how people will perceive the process. If barriers prevent them from participating, then they may have an automatic negative attitude towards the process and project. Therefore, it is essential to understand the motivators and barriers of public participation to recognize how these factors impact attitude, particularly with brownfield conversion.

People must be motivated before they are willing to engage in public participation. Laurian (2004) studied motivations for participation in-depth and found that the highest motivation for participation on toxic waste sites was being informed about the site, risk perception and years of residency in the area. Without knowledge of the site and believing there is a risk, there is no reason for people to intervene (Laurian 2004; Solitare, 2005). Participation by the public is more likely if their reaction to the site is extreme (Zhang et al., 2010). Furthermore, proximity greatly affects one's risk perception of the site and the person is more likely to participate because it will affect his or her everyday life (Brody et al., 2008; Dear, 1992). Takahashi and Dear (1997) found that residents are more likely to take action when they live in close proximity and are opposed to the situation. To encourage participation, the site may need to be framed in a way to create a more outraged response so that the incentive is personal and the individual has a reason to intervene (Solitare, 2005).

Trust is a multifaceted concept and is generally defined as belief of reliability or ability of someone/something. Thomas (1998) notes that trust functions on interpersonal and institutional levels and includes cognitive, emotional and behavioral components. Since trust cannot be externally measured, studies usually rely on self-reported levels of trust and are usually conducted through a Likert scale. Therefore, analyzing trust is dependent on a person's own interpretation of what it means to them. In regards to brownfields and solar energy farms, people can trust or distrust different components such as technology and institutions involved. Distrust of the technology and the managing institutions increases motivations to get involved. In an interview conducted by Wakefield and Elliot (2000), one resident commented how he "never heard of any man-made thing that ever worked the first time, there's always better things made after that" (p. 1148). This distrust increases the notion that their communities were in danger and the need to save their community from the institution or technology wreaking havoc. Essentially, distrust encourages intervention to protect and ensure that your self-interests are being met (Laurian, 2004; Soliatre, 2005, Pew, 1997). People who trust that the site would be taken care of properly are more likely to remain passive and not personally engage on the issue (Laurian, 2004; Soliatre, 2005). Conversely, some scholars argue that trust is needed to foster efficacy and participation (Beierle, 1999; Lyons and Lowery, 1986). Without believing your actions matter, there is little reason to participate because it would go against public choice theory. Therefore, there needs to be enough distrust to get people involved in the process to protect their interests, but enough trust in the process to believe your participation will have an effect on the decisions.

In addition to personal motivators, the proper circumstances need to occur to allow for meaningful participation, such as an active social network within the community and availability of resources such as time and money. Meaningful participation is when opportunities allow citizens to actively make decisions and affect change (Soliatre, 2005). When these circumstances do not line up, there are barriers to participation. Communities with social networks tend to have higher participation because they are invited to participate more often and have a higher knowledge of the circumstances. In addition these social networks may influence and increase risk perception of the site through continuous exposure as it did in Brody et al.'s research (2008). These networks function as a method of recruitment (Verba, Schlozman and Brady, 1995). Soliatre (2005) found that cities with greater social networks such as neighborhood organizations, "had more meaningful participation because they were able to organize the residents to focus on the issue" (p. 929). Their participation had greater impact because when voicing an opinion as a group, the argument holds more weight (Berry, 1999). Community networks and influences provide more opportunity and encouragement for participation. Without these strong networks, it is harder to find the motivation to participate.

Other resources such as time and money affect participation. Even if one has decided to make participation a priority, they need the resources to act. Time is a requirement for participation and significant participation requires even more time (Brady et al. 1995). Generally, those with more personal resources, such as income, are able to bear the cost of

participation and able to make participation a priority (Lyons and Lowery, 1986). Laurian (2004) verified this notion and determined that income was the only socio-demographic characteristics that correlated with participation. Higher income does not automatically result in having more available time. However, it suggests the ability to alter work hours or hire a sitter, which provides the time to participate. Without these resources it can be become very difficult, or impossible, to participate. Feeling excluded can automatically affect attitudes towards the project because they cannot voice their opinion in a forum that will make a difference and influence the outcome.

The process needs to be an important consideration when understanding what influences attitude because it can have a major impact on the project. There is extensive literature on how public participation influences attitudes towards environmental issues, including small renewable energy usage. However, there is little literature that directly correlates public participation affects with solar energy farms.

INFLUENCES ON ATTITUDE: LOCAL CONTEXT

People do not form attitudes completely on their own because people do not exist in a solitary world. The context of where people live influences their opinions because every location has its own unique worldview. Worldviews can be influenced by local culture, local politics, local economic condition and local media. Therefore, depending on the local context, people may be more or less receptive of a brownfield to brightfield site in their community.

Cultural and Economic

Culture is embedded all around people and cities, even if they are not conscious of it. It influences how we prioritize economics and value sites in the community (Hauser et al., 2007). West et al. (2010) uses cultural theory as a heuristic device to better understand climate change and the same principles can be applied to brownfield to brightfield sites. Cultural theory combines worldviews with social influences by evaluating the extent of incorporation into the community and the social norms that influence behavior (West et al., 2010). Through this model, there are four main cultural types: individualists, hierarchist, egalitarian and fatalist. While there are many critiques of cultural theory such as stereotyping, not accounting for multiple dimensions nor shift in dimensions, it still proves to be a useful tool (West et al., 2010). West et al. (2010) found in regards to large scale renewable energy sources that individualist view it as a good business, hierarchist believe it should be used even though it will have negative effects on environment and egalitarian believe it is a good idea as long as there are no negative consequences on the natural environment (West et al., 2010). Essentially, overarching cultural views can have a hand in determining what factors are most important to an individual and influencing attitudes towards the project.

Cultural and social norms dictate how people assess information such as what developments are permissible within the community (O'Riordan and Jordan, 1999). These norms influence what people perceive as a risk, amenity or opportunity (Zhang et al. 2010; Devine-Wright, 2005). The social and economic value of the site depends on if the site is

considered a risk or amenity (Zhang et al. 2010). For instance, "in the new rural economy the commodification of rural landscape, culture and lifestyle is more important than the physical exploitation of the land… often in pursuit of the 'rural idyll'" (Woods, 2003 p. 312). Therefore, depending on community preferences, they may see open land as more valuable than a renewable energy source. Overall, community cultures, social norms and economic culture have a strong association with one another and they influence the attitudes toward the community (Huggins and Thompson, 2015).

On a more local scale, communities that are used to mining or industrial sites tend to be more accepting of new industry energy developments because it is familiar to them (van der Horst, 2007). They are less likely to perceive the new development as a risk because it fits within the local context of what is acceptable within the community. People will also be more accepting if friends and their social network find it acceptable. Devine-Wright's (2005) study on wind energy attitude reported that the opinion of friends were highly influential. By following the lead of social network and friends, people follow their community's social norms. By understanding cultural norms, it is more likely for the development to succeed if the development is framed to fit within the community's social norm construct.

Political

Local politics can create controversy and influence people's attitudes towards the project. In order for policies to function properly, they must be tailored to fit local criteria; when policies are created at "too high a jurisdictional level" failure is more probable (Rydin and

Pennington, 2000 p. 166 citing to Ostrom 1990, 1996; West et al., 2010). Legislation on the state and federal level can increase economic and regulatory pressures on local politicians (Gibbs, 2000). State and federal legislation such as the Minnesota Renewable Energy standards help direct and guide local politics. Sometimes state legislation requires cities to change too quickly, which can cause resentment from community members. This resentment is usually targeted towards local politicians and can cause a volatile situation between the community and politicians. Pressures can also stem from local governments and politicians inherently struggling to access limited resources and power (Gibbs, 2000) and sometimes this struggle can create misgivings from the public. Misgivings and distrust of politicians especially occur when the public feels particularly vulnerable and are being forced to change (Eiser et al., 2007).

Information used to supplement political agendas and policies can influence attitude. Controversy exists on whether it is best to use expert scientists or to utilize community members who have extensive local knowledge. Bringing in outside scientists run the risk of their science being framed and altered to coincide with political agendas (Maasen and Wingart, 2005). Scientists can spin their knowledge to fit within their chosen paradigm and present their findings as the definitive answer; politicians dislike uncertainty (Pellizzoni, 2011). Politicization of science can create policies based on inaccurate data and assumptions. Therefore, more options should be considered than solely relying on outside expert knowledge. Fischer (2000) argues that supplementing local knowledge with professional expertise, can effectively solve environmental problems by framing expert

opinion within the local context so it is more effectively tailored to the situation. Local involvement can also increase positive reactions to renewable energy by making them feel central to the solution (Devine-Wright, 2005). Local politics will always have an effect on public opinion, but seeking resolution with the appropriate information will help negate negative pubic reactions towards the political process.

Media

Media coverage is a useful way for local people to gather information on local events and projects. For many people, news is the only direct exposure they will have about alternative energy sources and therefore, can have a major impact on their perceptions (Braunholtz, 2003). Media outlets have the power to interpret the news and dictate how the information is reported to the public, which can then influence public opinion without the media directly providing an opinion (Appleyard, 143). For instance, the extreme weather coverage increased awareness of climate change risks (Wilson, 2000; Bell, 1994) and reporting health problems associated with toxic chemical releases increased risk attitude (McCluskey and Rausser, 2001). However, unless environmental topics and concerns air during prime time, people will not perceive the information as important. As McComas, Shanahan, and Butler (2001) found, environmental issues rarely receive prime time coverage. Thus reducing exposure to this concerns and by extent, they are promoting the notion that environmental problems do not exist, or are at least not of great importance (Eveland and Cooper, 2013). Essentially, media outlets have the power to alter peoples' attitude towards

environmental issues simply by altering when those reports are aired and choosing how to frame the information.

While media chooses what information to report, people tend to be selective of the reports they read. People tend to select media that supports their own preconceived notions and beliefs (Eveland and Cooper, 2013), which supports the notion of cultural theory. Therefore, exposure to media tends to only amplify their beliefs, especially when in conjunction with discussion of the topic with other people. Media rarely changes people's perspectives because they will either chose not to watch/read the information or adjust the information to fit their preconceived beliefs (Eveland and Cooper, 2013). Media can try to alter perspectives, however in the modern world people have the power to choose their news source and only read/watch those that reinforce their beliefs. In order to alter perspectives, the new information must fit within their preconceived beliefs or it will not be received.

The local context influences a person's worldviews and attitudes toward projects. By having a better understanding of these worldviews, the project can be framed so it seems more familiar and consistent with local culture, social norms and economics. Media can also frame the information so it is more approachable to a specific region or community. The literature is scarce explaining possible differences on political and economic approaches based on regional cultural, which would be helpful to better understand possible regional differences of brownfield to brightfield sites in the United States.

INFLUENCES ON ATTITUDE: PERSONAL VALUES

Values guide a person's perspective towards brownfield redevelopment and solar energy. Many studies have examined the relationship between values and perspectives to see if there is a connection. Self-transcendent values focus on the environment and the community as a whole whereas self-enhancement values focus on the individual. A general theory is that self-transcendent values, such as biocentrism, focus on the collective consequences, and will be high predictors of pro-environmental attitudes. Whereas, persons with self-enhancement values will focus on personal benefit and economic worth (Bidwell, 2013; Dietz et al., 2005). While scholars have used values to understand attitudes and behaviors, values are a better predictor of attitudes than behaviors (Steg et al., 2014). Values are probably more telling of attitudes instead of behaviors because people do not always align their actions with their attitudes. Mitigating factors such as finances or other family member's perspectives can prevent personal intentions from directly translating to behavior. Therefore, this paper focused on how values affect attitude, not behavior.

There is a strong consensus among scholars that strong biocentric values influence pro-environmental attitudes (Perlaviciute and Steg, 2015; Steg et al., 2014; Warren and Birnie, 2009; 2009 Steel et al., 2015; Clark et al., 2003). Values can even influence attitudes towards the consequences of renewable energy (Perlaviciute and Steg, 2015). For instance, persons with biocentric values are more likely to perceive renewable energy as environmentally friendly and persons with egoistic values are more likely to focus on the

negative environmental consequences. These findings are in line with value theory, which posit that people will select and pay attention to the information that is relevant to their values (Nordlund and Garvill, 2002; Stern and Dietz, 1994). However, Bidwell (2013) is not convinced that values directly affect attitude. Instead he concludes that values have an indirect effect on perceptions of the environment and perception on economic outcomes of development (Bidwell, 2013). Therefore, a more in-depth study is required to analyze if values cause and directly influence attitudes or if they are just indirectly related. Overall, values do have a relationship with perspectives of developments and should be considered when analyzing influencing factors of attitude. However, personal values can be altered by many factors, and as a result may not be a consistently strong influence on attitude.

While this study focused on the attitudes of the individual, it is important to realize that influences from other persons within the household and work environment can influence a person's value set. In a study done by Bateman and Munro (2009), they discovered that a person's values can change based on being asked questions alone or with their cohabitating partner. Therefore, this study needs to consider that others within the household can influence the respondent's values and attitudes towards the project and skew the results of the study. Factors in the work place can also influenced environmental action and values (Blok et al., 2015). Essentially, a person's values can be easily influenced by other people and factors; values can even change moment to moment. The extent of another's influence on personal values can relate to the psychological tendency of people being either completely concerned with environmental issues, or none at all (Lindell, 1994). Therefore,

it is important to realize personal values can be fluid and take that into consideration during this study by asking separate questions about the individual's and the household's attitude.

While there is extensive research correlating environmental values to attitude and behavior, there are gaps when exploring direct relationships between values to brownfield conversion or solar energy farms. The impact values have on attitude may not be strong or consistent because values can be fluid and easily influenced by other factors.

INFLUENCES ON ATTITUDE: SOCIO- DEMOGRAPHIC

While not a purely determinative factor, socio-demographics can influence attitude and be used as a predictive tool. Socio-demographics have some influence on environmental attitudes, behaviors and concerns as well as support for renewable energy sources and the likelihood of engaging in public participation forums. In regards to environmental attitudes, gender, age, race, income and education are the most common demographic variables tested.

Gender

Studies on gender usually determine that women have stronger environmental views or there is no significant relationship between gender and environmental views. Women also possess stronger pro-environmental perceptions, participate in environmentalism behaviors (McCright, 2010; Stern, Dietz and Kalof, 1993; Zelezny, Chua and Aldrich, 2000) and have higher concerns for the environment (Raudsepp, 2001). Women could be more

concerned about the environment because women tend to feel more social responsibility (Zelezny, Chua and Aldrich, 2000) and gender is the most influential variable with risk perception (Filipsson et al., 2014). Women tend to see more risk in the environment, such as being more threatened by climate change (Brody, 2008; Raudsepp, 2001). In addition, women are more inclined to be less confident in their own knowledge (Lizotte and Sidman, 2009; Mondak and Anderson, 2004; Gutteling and Wiegman, 1993; Lundeburg, Fox and Punccohat, 1994). Whereas, men tend to be more confident with their own knowledge, or guess when uncertain, and believe there is more time to find solutions for the environment (Brody et al., 2004, Lizotte and Sidman, 2009; Mondak and Anderson, 2004). Therefore, women lean towards pro-environmental attitudes because they are more concerned of the consequences if people do not take care of the environment. However, not all studies show that gender has a significant correlation (Van Liere and Dunlap, 1980) especially, when other variables are considered such as altruism, age, asthma, household size and income (Clark et al., 2003). Specifically studies on alternate energy sources, determined that gender was not significant (Steel et al. 2015; Bidwell, 2013). These differing results suggest that gender is not a strong determinate factor, but has influence within certain contexts.

Age

Persons who are younger tend to have stronger positive attitudes towards the environment and support for renewable energy (Steel et al., 2015) because younger persons are more open to environment attitudes (Ollie et al., 2001; Fransson and Garling, 1999). In one study

by Takahashi and Selfa (2015), older aged persons had more positive environmental attitudes. However, these results could be explained through length of residence since Takahashi and Selfa determined that length of residence and gender are more predictive then other demographic variables (2015). Therefore, it is possible to use age as a predictive factor of attitude, but it does not appear to have a strong influence.

Race

There is very little evidence to suggest that race, on its own, is a predictive measure. Morrissey and Manning found that race was not significant when studying environmental concerns and Laurian found that race was not significant for public participation (2000; 2004). However, there are differences in participation between minorities and whites. Minorities are less likely to get involved with public participation (Junn, 2000), but whites are more likely to use trust of institutions as an explanation for not participating (Laurian, 2004). However, under certain contexts, race can be a predictive factor. For instance, African Americans had greater concern for the environment because they were more exposed than other groups (Arp, 1994). This suggests that environmental justice is more indicative of environmental concerns rather than race. Therefore, other factors behind race are probably more influential towards attitude than race itself.

Education, Income and Household Size

Persons with higher education and higher income, which usually coincide, tend to be more familiar with the state of the natural features around them, have greater concern for the

environment and participate in the planning process (Brody et al., 2004; Clark et al., 2003; Jones and Dunlap, 1992; Scott and Willets, 1994; Brody et al., 2004; Guagano and Markee, 1995; Raudsepp, 2001; Lyons and Lowery, 1986). Persons with higher education are usually more knowledgeable and open minded toward environmental concerns. Specifically, persons with higher education are more inclined to support renewable energy sources (Steel et al. 2015; Bidwell, 2013). In addition to education and income, household size can be an influential factor. Clark et al. (2003) concluded that persons in larger households, participate in more environmental concerns. Higher participation rates by persons in larger households, persons with higher education and persons with higher income having supports rational choice models because with more resources at your disposal, it is easier to justify spending more resources and make their views known (Clark et al., 2003). All of these factors provide persons with excess resources that allow them to participate. Therefore, when this group decides to not participate it is due to resignation, not inability (Laurian, 2004). Education, income and household size can influence both environmental views and the ability to participate/act on their views. Thus, these factors can be used to better further understand attitudes towards environmental projects and the surrounding context.

Socio-demographic characteristics tend to be the background variables when analyzing attitude. However, some studies are specifically focused on understanding these relationships in depth. Generally, socio-demographic characteristics are found to have some correlations with attitudes, but the strength of these relationships depend on specific

contexts. Literature has also yet to fully explain the reason why some socio-demographic have correlations with environmental attitude, such as age.

RESEARCH QUESTION

Facts and attitudes towards brownfield redevelopment and solar energy farms provide further insight in regards to a combined assessment of attitudes towards brownfield to brightfields sites. All influences on attitudes will have some influence, but some effect might have more impact than others. Analyzing these concepts together provides a framework for answering what factors influence people's attitudes towards a brownfield to brightfield site within their local community through the RE-Powering America's Land Initiative. A study that incorporates all these factors is a way to determine which factors are most influential. This study will be beneficial because it can provide information to help influence policy recommendations to the EPA and NREL to increase the chance of positive reception towards such projects. Positive attitudes promote rather than impede a brownfield site's conversion to a brightfield.

METHODS

The purpose of this study was to determine the relative importance of different factors affecting an individual's attitude about brownfield to brightfield redevelopment. To do so, the study assessed the attitude toward individuals living within a 1,500 feet radius of the

physical barrier separating the site from residential areas, as explained in the selecting participants section that follows. I describe the site selection process, as well as a brief description of the study sites, followed by the participant selection process. Finally, I describe the survey methods I chose to obtain information from participants and the associated variables these surveys generated. I also acknowledge the limitations of the study design throughout the description of the study methods.

SITE SELECTION PROCESS

The study sites were based on the Environmental Protection Agencies' (EPA) RE-Power America's Land Initiative. Cities recommend sites within their boundaries for the EPA to analyze. The National Renewable Energy Laboratory (NREL) then conducts feasibility sites under the direction of the EPA's recommendation of selected sites to determine if the contaminated site is suitable for a renewable energy. Multiple types of contaminated sites are examined including brownfields, Superfund sites, landfills and Resource Conservation and Recovery Act (RCRA) sites including hazardous waste treatment, storage and disposal facilities. These sites can be converted into multiple types of renewable energy including solar, wind, biopower and geothermal. For this study, the specific sites considered were brownfield sites that are currently proposed for solar energy farm conversion. This study examined proposed sites as opposed to completed sites out of necessity. Converting brownfield sites to solar energy farms is still a relatively new concept and these developments take a few years. Also, the results of the study can have more of an impact on policy decisions when the projects have not been constructed. There are six sites that

are associated with the RE-Power America's Land Initiative that fit the above criteria. These six sites are in Brisbane, California; Perry, Iowa; Duluth, Minnesota; Deming, New Mexico; Lackawanna, New York and Nitro, West Virginia.

Out of these six sites, two sites were eliminated because they are a series of smaller sites instead of one concentrated site. Risk perception literature indicates that frequency, severity and personal experience of hazard sites and events affect the individual's attitude (Lindell and Perry, 2004; Zhang, Hwang and Lindell, 2010). Therefore, cities with multiple sites were eliminated to reduce differences of risk perception among study sites. It helps to keep the study sites consistent so that the data is more comparable. Two of the four remaining sites have residential neighborhoods with at least 500 households within 1,500 feet of the physical barrier separating the site from residential areas and were chosen as the study sites: Brisbane, California and Lackawanna, New York.

STUDY SITES

The EPA along with the NPEL have conducted Feasibility Studies on each of the study sites to determine the viability of developing solar energy farms. These sites have unique community characteristics and each have different motivations for possible conversion to solar energy generation. The information below was gathered and reported by the EPA with the NPEL for the RE-Power America's Land Initiative.

Table 1

Approximate Demographic Information of Study Area Population

City	Brisbane, CA	Lackawanna, NY
Site Name	Brisbane Baylands Site	ArcelorMittal Tecumseh Redevelopment Inc.
Occupied Households	888	531
Population	3,542	1,575
Race		
White	7.1%	52.7%
Black	5.2%	37.5%
Asian	68.9%	
Hispanic	17.9%	9.7%
American Indian	0.01%	
Multirace	0.01%	0.1%
Sex		
Male	47%	52.8%
Female	53%	47.1%
Median Age	36.9	25.9
Median Income	$64,698	$19,021
Median Home Value	$529,263	$68,210
Percent Unemployment	3.58%	36.3%
Residents below poverty level	8.85%	43.8%

Source: City-Data.com and ACS 2014

The Brisbane Baylands site in Brisbane, California is located on the western part of the San Francisco Bay and is bordered by the Bayshore Boulevard. The site is roughly 684 acres and was previously used for railroad freight operations and was a municipal landfill. Currently, the site contains vacant buildings that were previously used by the rail yard and used for clean fill operation for nearby construction. In addition to solar energy, a new transit-oriented mixed use development is proposed for the site. The intention for the site is to reduce its carbon footprint by utilizing the energy generated on-site for the mixed-use development. The EPA is planning for 24.7 acres or 132.2 acres of the 684 acre site to be set aside for ground-mounted PV systems. There are approximately 888 occupied

households within 1,500 feet of Bayshore Boulevard. These neighborhoods are predominantly Asian with a median income of approximately $64,698. The City of Brisbane conducted a survey in the fall of 2015 of all registered voters in Brisbane to gauge community opinion and attitude towards the potential solar energy development on the Brisbane Baylands sites. Overall, responses indicated that residents prioritized environmental issues when pursuing development options for the site and approved of the potential solar energy development. However, this was all the information that was available to the public. It appears that the main focus of their survey was to gauge general opinions about the potential solar energy development whereas, this research considers different factors that could influence attitude. Understanding influences on attitude can provide guidance on how planners and agencies can affect attitude.

Map 1

Brisbane Bayland Site Boundaries:

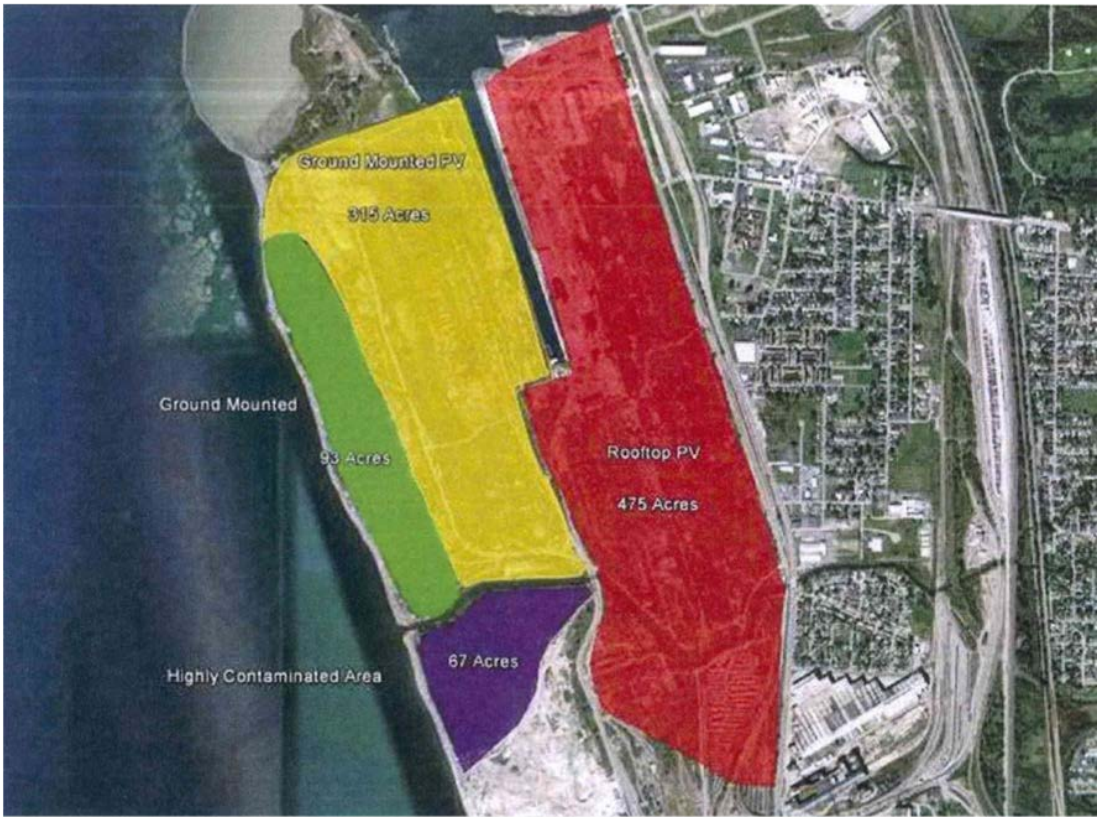
Source: RE-Power America's Land Initiative Feasibility Study

The ArcelorMittal Tecumseh Redevelopment Inc. property in Lackawanna, New York is located on the shore of Lake Erie. The site is approximately 1,100 acres and was once home to the Bethlehem Steel Plant. The main site is vacant with remnants of old buildings and some semi-wooded areas. Both the ArcelorMittal Tecumseh Redevelopment Inc. and the City of Lackawanna are interested in redeveloping the land for solar power, wind power, and light industrial buildings. The community intends for the site to build upon the success of the nearby Bethelem Steel Winds facility, which was a brownfields redevelopment project, and help provide jobs to the community. Jobs were especially appreciated since the Great Lakes region has recently experienced massive job losses from de-industrialization. Residential developments are located east of the site. Approximately 531

occupied households are located within 1,500 feet of Highway 5. Households are predominantly White with a median income of approximately $19,021. The EPA has identified 325 acres available for ground-mounted PV systems in the center of the site and 93 acres for ground-mounted PV system using micro-inverters. There is also the potential for another 218 acres of roof-mounted solar panels. By combining solar energy generation with light industrial, the site should help produce more jobs for the community.

Map 2

ArcelorMittal Tecumseh Redevelopment Inc. Site Boundaries:



Source: RE-Power America's Land Initiative Feasibility Study

SELECTING PARTICIPANTS

Residents near the site were studied because people who reside in close proximity to the site are more likely to be conscious of the site and its economic, environmental and social impacts to the community's quality of life. Previous studies have recognized that residents are uniquely impacted by environmentally toxic sites because they live next to the sites (Laurian, 2004). This research is similar to Laurian's (2004) work in that it focuses on residents, rather than other community members such as business owners or land owners, even though these groups also have legitimate concerns. This study is purposefully restricting the sample to residence to produce more focused research.

A radius of 1,500 feet was chosen because 1,500 or .25 mile feet radius is common for studying both social and fiscal impacts from brownfield redevelopment (Letang and Taylor, 2012; De Sousa, Wu and Westphal, 2009; Watkins, 2010). For example, De Sousa, Wu and Westphal (2009) studied multiple radiuses around the study area to better understand economic impact of brownfield redevelopment. The highest economic impact was within 1,500 feet. When the radius was extended to 1,500-2,500 feet, the economic impact from redevelopment was roughly cut in half. Since .25 mile and 1,500 feet are approximately the same distance, choosing one distance over the other should not significantly impact the results of the study. 1,500 feet was ultimately chosen because it is a more precise distance. The radius starts at the edge of the physical barrier separating the

site from residential areas because the physical barrier can create a psychological barriers within communities (Anciaes, Jones and Mindell, 2014; Bradbury, Tomlinson and Millington, 2007; Social Exclusion Unit, 2003). It is likely that people perceive physical barriers such as roads and railroads as what separates them from the project site; since a physical barrier separated the site from the residential neighbors. Therefore, residential units within 1,500 feet of the physical barrier, in these cases a road, separating the site from residential areas are considered the study population before sampling.

The sample of participants was selected using systematic sampling and some convenience sampling. In each instance, the information letter requests that one adult within the household of every third standalone residential unit to take part in the study. For the systematic sampling portion of this study, address-based sampling was used and has been previously effective for cross-sectional surveys similar to this study (Link, Battaglia, Frankel, Osborn and Mokdad, 2008; Smyth, Dillman, Christian and O'Neill, 2010). Address locations were obtained from the respective cities' GIS data, which is available to the public online. The data for Brisbane do not indicate which households are occupied so it is possible that results were skewed with an overrepresentation of vacant households within that sample group. There is an approximate vacancy rate of 8.32% according to the 2010-2014 American Community Survey 5-Year Estimates in this neighborhood. This percentage is less than the national average vacancy rate, 12.45% (2010-2014 American Community Survey 5-Year Estimates). Therefore, the vacancy rate should not be a concern. Lackawanna's GIS data does indicate vacant sites and according to the 2010-2014

American Community Survey 5-Year Estimates there is an approximate 13.14% vacancy rate in the neighborhood. While the vacancy rate in Lackawanna is higher, the sample is less likely to be skewed by an overrepresentation of vacant houses because many of the vacant houses were indicated in the city's GIS data and removed from the population before sampling.

I chose systematic sampling to get a representative sample of the population who could participate in the study (Babbie, 2012). By choosing households at equal intervals, there is a greater chance of getting information from every neighborhood and a diverse sample of the socio-demographic variables studied. However, systematic sampling does not guarantee provision of the most representative sample of the population. Stratified sampling could have resulted in a better representation of the population, but was not chosen because it would have been difficult due to the relatively small sample size and the expected response rates (Vallabhaneni, 2005). Ultimately, systematic sampling was chosen because it was the method most likely to produce a representative sample of this study population.

While not the focus of the methodology, I used convenience sampling towards the end of the study to help increase the survey response rate. Local religious institutions located in the study areas were contacted because they are embedded within the communities and are in close proximity to the study sites. I contacted them by phone and email to ask that they provide assistance with increasing awareness of this study, emphasizing the importance of

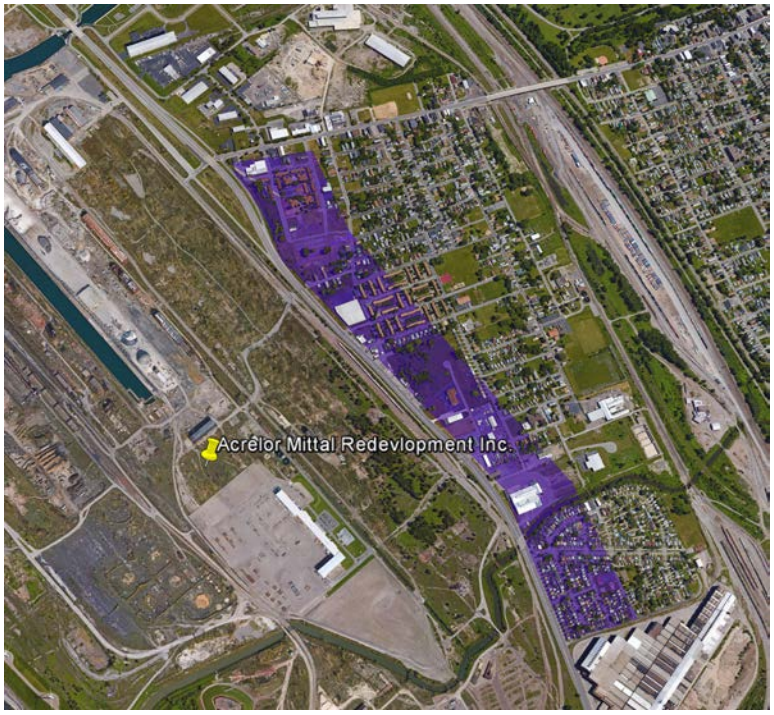
responding and encouraging persons to take respond to the survey. It was believed that their assistance would help increase the response rate because community networks tend to have influence over a person's actions (Soliatre, 2005). Since it is not guaranteed that members of these organizations reside in the study area, the online survey asked for the respondent's residential street to better understand their proximity to the site. However, only having the street name cannot verify the respondent is within 1,500 feet of the study site. Therefore, the proximity restriction may be invalid because some respondents may not reside within 1,500 feet of the study sites.

Map 3

Study Area for Brisbane, California

Map 4

Study Area for Lackawanna, New York



SURVEY ADMINISTRATION

Surveys were used to gather information about attitudes and influences on those attitudes. The survey was used to gather responses and data about the sample group. Both mail and online surveys were used to collect data. Mail surveys were chosen as the focus because respondents tend to prefer paper surveys and even if they prefer other modes, they seem willing to complete a paper survey (Olson, Smyth and Wood, 2012). Mail surveys are most appropriate for lower income communities, such as Lackawanna, who may not have the access required to complete an online survey. Surveys were mailed to the participant's residential address directing him or her to fill out the survey. A letter accompanied each

survey, which included instructions and a request for an adult in the household to complete the survey. Additionally, a pre-stamped envelope was included with the return address to make returning the survey more convenient. In addition, the pre-stamped envelope acts as a sign of trust and goodwill that encourages the respondent to complete the survey (Dillman, Smyth and Christian, 2014). Dillman, Smyth and Christian (2014) also suggest personalizing the survey. Personalization helps increase response rate by reducing the social distance between the respondent and surveyor. Even using the description of the city could be beneficial. The letters began with "Dear Lackawanna Resident" or "Dear Brisbane Resident" depending on the appropriate city to help personalize the surveys and increase the response rate.

Reminder postcards were sent two weeks and four weeks after the initial survey mailing (Dillman, 2000). Reminder postcards were used because multiple points of contact help increase response rate (Dillman, Christian and Smyth, 2014). The first reminder postcard requested that the participant fill out the mail survey. The second postcard was different because in addition to requesting their participation, it provided the option of filling out the survey online. The second postcard included a website address to which the respondent could go to and fill out the survey. The option of filling out the survey questions online was provided to help increase the initial response rate because the mail survey is most likely no longer in their possession four weeks after the initial mailing. Both the mail and online survey asked the same questions; the only difference between them is that the online survey asked the respondent's street name to verify that they were within the prescribed

radius from the study site. Only the street name was requested, not the street address, to help maintain anonymity.

LIMITATIONS OF THE SURVEY ADMINISTRATION

General limitations of the survey's administration should be considered to better understand the generalizability and validity of the survey responses. Dillman, Christian and Smyth (2014) suggest sending out an initial mailing before the survey to increase awareness of the survey, which helps increase the response rate. This study chose not to send out an initial mailing before the survey because of limited resources. The fact that there was no initial contact before the survey may have lowered the response rate.

In regards to timing of the separate mailings, Dillman (2000) recommended sending the first reminder postcard two weeks after the initial mailing whereas, Dillman, Christian and Smyth (2014) suggest a few days to one week after the initial survey mailing to send the first reminder postcard. Literature on the follow up reminder timing varies depending on the population surveyed when the research was conducted, but Claycomb et al. (2000) found that there is no difference in responses rate depending on the follow up mailing timing. Two weeks for the first reminder postcard and four weeks for the second reminder postcard were chosen and implemented to space out the postcard mailings. It is possible that the extended time between the points of contacted were too long and lowered the response rate.

Providing the online survey option later in the survey administration may also be considered a limitation. The initial methodology of this study was to utilize only mailed surveys because mailed surveys generally have a higher response rate than online surveys (Dillman, Christian and Smyth, 2014). In an attempt to increase response rate with minimal cost, online surveys were provided as an option later in the study to allow for an additional method of access to the survey. Providing an online option earlier in the study might have increased the response rate by providing an additional method of access for the entire duration of the study, but was not done to try and maintain the proximity restriction of the study.

For both mail and online surveys, the information is self-reported and therefore, may not be completely accurate. Inaccuracies can be purposeful if the respondent has personal motivations to represent oneself differently or inaccuracies can be accidental through misinterpretation of the questions. To try and control for misunderstanding, definitions of the concepts were included in the survey instrument. Another limitation is language. If the respondent does not speak English, it was unlikely that they would seek the help of others to complete the survey. Therefore, non-English speaking persons were misrepresented in the study. The response rate from Brisbane, California was most affected since it has a majority Asian population and it is unclear what languages are regularly spoken even after attempting to contact the local city planners for more information. Unfortunately, I was not able to receive information on the appropriate languages for a possible translation of the survey. Therefore, Brisbane's response rate might be reduced by a language barrier.

Online surveys have their own specific limitations in addition to the limitations previously mentioned. According to the Pew Research Center in 2013, 85% of adults in the United States use the internet at least occasionally and 73% of adults use the internet at home (Pew Internet & American Life Project, 2013a, 2013b). Therefore, adults who do not use or do not have access to the internet will not be represented in the study through online survey responses. The majority of these adults include persons over the age of 65, non-White and persons with lower education and lower income (Pew Internet & American Life Project, 2013c). These demographics could indicate a reduced response rate from online surveys from Brisbane, California because there is a dominate minority population. Therefore, the responses may not produce an accurate demographic representation of the population. Additionally, the length of the website address could prevent people from attempting to manually enter or increase the change or error when attempting to enter in the website address. The website address used was as short as the website would allow to help mitigate these limitations, but the addresses could still be too long. Both instances could discourage persons from attempting or getting to the correct website. A QR code was not used in this study because it further limits those who could access the survey since it requires a smartphone to access the survey. This would be an issue for Lackawanna, New York since it has a low median household income. However, a QR should be in the future considered to help simplify the process of gaining access to the online survey.

Another possible limitation of the online survey is that the design of the survey is not compatible with all mobile devices, since people may opt to use their mobile device to

completely the survey. If the survey design is not compatible, it could cause frustration and reduce the response rate. It could also increase error if the questions and answers are not displayed correctly. For instance the spacing could be off or the buttons could be too small to accurately select (Callegaro & Macer, 2011). To help decrease these limitations, the survey was tested on a mobile device. However, testing the survey on a mobile device does not guarantee that all mobile devices will display the survey in the same manner. Limitations of both mail and online survey methods need to be acknowledged when analyzing data and the response rate.

DESIGN OF THE SURVEY INSTRUMENT

At the beginning of the survey, there was a letter explaining the study's intentions to avoid deception and a confidentiality agreement to increase participant protection as shown in *Appendix A* (Yin, 2009). The survey itself contained mostly closed-ended questions on a 7-point Likert scale to allow for descriptive statistics of the different variables studied in addition to measures of association tests (*Appendix B*). People are more likely to respond to close-ended questions because they are quicker and do not require as much critical thinking (Dillman, Smyth and Christian, 2014). The same concept applies to the survey more generally; when the entire survey is shorter and easier to complete, people are more likely to respond. Therefore, open ended questions were used more sparingly, to provide respondents the opportunity to elaborate on specific questions that they have already answered through a close-ended question. The survey itself was designed to be completed

in about 10-15 minutes to help increase response rate (Dillman, Smyth and Christian, 2014; Babbie, 2012).

The survey instrument was comprised of questions relating to general attitude and five influences on attitude: spatial, public participation, local context, personal values and socio-demographic factors. Each of these five influences were already discussed in the literature review, justifying their influence on a person's attitude. Responses from the five influences on attitude were analyzed individually using descriptive statistics and measures of associations to determine which influences had the most effect on a person's general attitude towards brownfield to future brightfield site. At the start of each section in the survey I provided definitions for the relevant key concepts to reduce misunderstanding and help to ensure consistent interpretations of the survey questions.

COMPONENTS OF SURVEY INSTRUMENT AND GENERATION OF VARIABLES

Dependent Variable: Attitudes towards Solar Energy Farms

Section 1: General Attitude towards Solar Energy Farms, addresses the person's general attitude towards a brownfield to brightfield site within their community, which is the dependent variable in this study. An example of these questions include, "How much will the nearby neighborhoods, as a whole, accept the presence of a solar energy farm?" This question was worded towards the entire neighborhood because it is easier to report the community's view as opposed to your own viewpoint because it removes ownership.

Explanatory Variables: Appearance, Place Attachment, and NIMBYism

Section 2: Attitude towards Solar Energy Farms' Design and Proximity contains questions that addresses spatial influences, including appearance, place attachment and NIMBYism. Questions representing social proximity pertain to visual impacts and exposure to the project. Visual impact was emphasized because environmental aesthetic and cohesion were the most important factors in approving the brownfield redevelopment projects in a study conducted by Letang and Taylor (2012). Pictures of past brightfield developments were provided to provide people with a reference when answering the visual impact questions. Visual impact was examined by asking "How important to you is the appearance of the structures affiliated with the solar energy farm in your community?" and "How important are the following aspects of the project to you? – Color of solar panels, Size of solar panels, Placement of solar panels (i.e., ground or roof mounted)." These four different aspects of appearance (overall importance, color of solar panels, size of solar panels and placement of solar panels) were combined together to create a variable that represents the overall importance of the solar energy structures.

Place attachment and NIMBYism was studied to determine if place-protecting behavior influences attitude towards the project. Length of residency was used to determine a person's level of place attachment since it is the highest predictor of place attachment (Brody, Highfield and Alston, 2004; Brown, Perkins and Brown, 2004). In regards to NIMBYism, general questions were asked about if the projects' location affected a person's attitude. For example, "I would prefer that the solar energy site is built at least 5

miles from my residence." These components together provide a better understanding of how spatial influences such as appearance, place attachment and NIMBYism affect attitude.

Explanatory Variables: Public Participation Attendance and Impact

Section 3: Attitude towards Participation asked questions about how the public participation process influence attitude. Questions were directed to the individual's own experience and pertained to frequency of participation, active engagement and input of their local knowledge, impact, and expected time spent (Brody et al., 2003; Fisher, 2000). Examples of these questions include, "How often have you participated in any public meeting?" and "How much do you believe your input makes an impact on the decisions reached at the meetings?" Attendance and impact are two separate components of the public participation process and could have different levels of influence on attitude towards the potential solar energy development, which is why both were part of the survey.

Explanatory Variables: Information Sources, and Cultural and Economic Viewpoint

Section 4: Sources on Renewable Energy and part of *Section 5: Personal Values* have questions that addresses the influences from the local context including information sources, and cultural and economic viewpoints. Questions pertain to how individuals received information about solar energy farms, specifically through media, local politics and social networks. This question read "Which of the following sources have informed, and to what extent have they informed your general opinion of solar energy farms? Check

all that apply and rate on a scale of 1 to7 – Local media, Local politics, National media, Family/friends/ neighbors opinion, Other." Rating each source allows for better understanding between these viewpoints and provides more information as opposed to ranking.

Questions also pertained to the respondent describing oneself as either an individualist, hierarchist or egalitarian because these different cultural and economic views can dictate what he or she prioritizes and influences attitude (West et al., 2010). A description of cultural and economic views were used instead of labels to help deter bias from preconceived notions and misinterpretations associated with the labels. These descriptions were, "I believe that nature is tolerant of human activities. I believe nature is vulnerable to human activities. I believe that natural systems can withstand some degree of human activities." Respondents were asked to describe "How closely do the phrases below depict your worldview" as opposed to requesting that they chose one viewpoint over another. This allows to better understand the gradient between these viewpoints and provides more information.

Explanatory Variable: Biocentric and Egoistic Values

Section 5: Personal Values contained questions pertaining to how personal values affect attitude. For this study, two values were evaluated: biocentric and egoistic. As noted previously, it is theorized that people who identify as higher biocentric values will perceive renewable energy as more 'friendly' and those who identified with egoistic values will

focus on the environmentally negative consequences (Perlaviciute and Steg, 2015). Instead of using the terms biocentric and egoistic values, general questions about the importance of the environment and the economy were used to deter label bias. A question was asked to determine "How important are the following in your community" with subsequent options. The "Reduced pollution from energy production" and "Cleaning site contaminates" represented biocentric values and "Creation of jobs," "Reduced energy costs" and "Local energy production" represented egoistic values. The responses to these community goals can indicate personal values and help understand how personal values can influence attitude towards the future solar energy development.

Explanatory Variable: Socio-Demographic

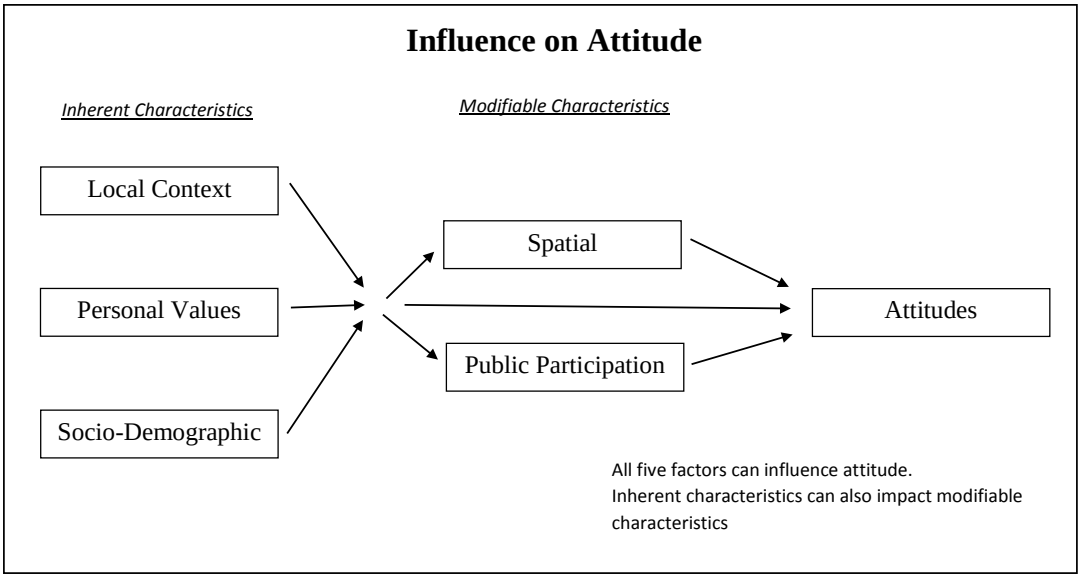
The last section of the survey, *Section 7: Socio-Demographic Factors*, gathered socio-demographic information from the respondent including age, gender, education, income, race, number of persons in his or her household, home ownership and length of residence. Each of these factors can shape a person's attitude toward the brightfield project. Questions pertaining to age, gender, education, household income, race/ethnicity and home ownership provided the respondent with various options to choose from. Questions pertaining to number of persons in the household and length of residency in the community allowed the respondent to fill in their response. Socio-demographics were last in this survey because people may find these questions sensitive and people are less reluctant to answer sensitive questions when they are towards the end of the survey because they have already invested in the survey (Babbie, 2012).

RESULTS

To answer the research question, what factors influence people's attitudes towards a brownfield to brightfield site in their community, hypotheses were analyzed to determine whether modifiable characteristics or inherent characteristics had more influence on attitudes about the potential development. Modifiable characteristics include spatial influence and public participation influence because these influences can be altered by planner, developer and agency actions. Whereas, inherent characteristics include local context influences, personal value influence, and socio-demographic influences and are not easily altered by planner, developer or agency actions.

All five of these influences were analyzed, but not reported because the significance tests showed that the influence did not have much of an impact on attitude. I am focused on the relationships that the literature and/or preliminary analysis indicated as being the most significant. Familiarity, appearance of the structure, egalitarian viewpoint, education and income were analyzed to determine the strength of their impact on the dependent variable, which is acceptance of the possible solar energy development. Analyzing these relationships will indicate if attitudes can be influenced by modifiable characteristics or if attitudes are most influenced by a person's inherent characteristics. It is important to note that inherent characteristics may have strong relationships with modifiable characteristics, but the focus this study is on how these factors together influence attitude towards the potential solar energy development, as shown in *Figure 1*.

Figure 1:



SURVEY RESPONSES

A total of 42 households responded to the surveys. 22 surveys were received from Brisbane, California and 20 from Lackawanna, New York, generating a 9.58% response rate when factoring in the 32 vacant households in the two study areas. Brisbane yielded a response rate of 7.91% whereas, Lackawanna yielded a response rate of 12.27%. 39 of the 41 surveys were from the mailed surveys. 3 of the surveys were completed online with 2 of the responses originated from Lackawanna and 1 from Brisbane.

Responses from Brisbane and Lackawanna were combined into one group for analysis because there was not a high enough response rate to yield statistically meaningful analysis for each study area. Combining these study areas into one dataset impacts the analysis

because these two study areas have different community characteristics and may not be representative of both study areas.

Overall, the demographics of the respondents do not match the demographics of and study site's population (*Table 2*). Particularly, the average age of the respondents are considerably higher than the average age of the sample population. Therefore, age is highly restricted and is not a representative sample of the population. The responses represent the older white population's perspective within the study areas.

Table 2:

Approximate Demographic Information of Study Area Population & Demographics of Survey Respondents

	Brisbane, California		Lackawanna, New York	
	Popualtion	Sample/ Respondents	Popualtion	Sample/ Respondents
Race				
White	7.1%	68.2%	52.7%	50.0%
Black	5.2%	0.0%	37.5%	0.0%
Asian	68.9%	4.5%	0%	30.0%
Hispanic	17.9%	18.2%	9.7%	5.0%
American Indian	0.01%	0.00%	0%	15.0%
Multirace	0.01%	0.00%	0.1%	0.0%
Sex				
Male	47%	45.5%	52.8%	50.0%
Female	53%	54.5%	47.1%	45.0%
Median Age	36.9	61	25.9	60
Median Income	$64,698	$62,000	$19,021	$64,500

Source: City-Data.com, ACS 2014 and Survey Responses

QUANTITATIVE ANALYSIS

Descriptive Statistics

A general understanding of the data is required before an analysis of the separate hypothesis between influences and acceptance are conducted. Information on descriptive statistics including mean, median, standard deviation, variance and skewness for each variable can be found on *Table 3*. Some of the variables were collapsed together to allow for further analysis. These variables are indicated as 'collapsed' on the table and all of the variables used to create the collapsed variable are directly underneath it. Not every variable has an N of 42 because not every respondent answered all of the questions on the survey. Hence, the N will differ throughout the analysis. All of the variables have a range of 1 to 7 on an ordinal scale except duration of residency, which has a range of 9 to 65 years. This indicates that the respondents are persons who have lived in the community for a while and are invested in the community.

Variables with particularly high averages (mean, median and mode) include importance of appearance and egalitarian viewpoint. Conversely, familiarity towards the potential development had a relatively low average with a mean value of 3.19. Variables with particularly high and low averages could indicate that the sample population is skewed towards a more extreme view, but needs to be further examined with variance.

Variables with unusual variances and standards deviations include importance of solar panel color and household income. Responses for these variables are not evenly distributed.

For example, importance of solar panel color has a variance of 6.19, which suggests that respondents either felt this aspect of appearance is ‘not at all important’ or ‘extremely important’. In this case, the majority of respondents, 10 out of 41, indicated the color of the solar panels were ‘not at all important’ and 11 indicated they were ‘extremely important’ (*Figure 2*).

Skewness depicts the asymmetrical nature of the data distribution. Variables with a negative skew of over -1.0 include appearance and egalitarian viewpoint. In regards to egalitarian viewpoint, the skewness is -1.48. The negative skew indicates that the majority of respondents lean towards the higher end of the spectrum; in this case ‘highly accurate’ as depicted in *Figure 3*.

Analyzing these various descriptive statistics for the variables studied provides a lot of information about the survey responses and their general trends. These descriptive statistics indicate that familiarity, appearance of the structure and egalitarian viewpoints are all considered very important to the respondents and may have a strong relationship with acceptance towards the potential development. Familiarity and appearance are considered modifiable characteristic and egalitarian viewpoint is considered an inherent characteristic. Therefore, both modifiable and inherent characteristics could influence acceptance. The relationships between the different influences and acceptance of the potential solar energy farm are discussed in the next section.

Table 3:

Descriptive Statistics

Influence Category	Variable	N	Mean	Std. Deviation	Variance	Skewness	Skewness Std. Error
General Acceptance *	Acceptance of potential new development	32	4.9688	1.73176	2.999	-0.982	0.414
Spatial*	Familiarity of potential new development	37	3.1892	2.13226	4.547	0.466	0.388
Spatial*	Importance of apperance (collapsed)	41	4.7683	1.86111	3.464	-.305	.369
Spatial*	importance of appearance	41	5.4146	1.78851	3.199	-1.052	.369
Spatial*	solar panel color	41	4.0976	2.48802	6.190	-.086	.369
Spatial*	solar panel size	41	4.7317	2.07394	4.301	-.647	.369
Spatial*	placement of solar panels	41	4.8293	2.08450	4.345	-0.632	0.369
Public Participation	Public meeting attendance	42	4.1429	2.10193	4.418	-0.018	0.365
Public Participation	Impact at public meeting (collpased)	41	3.2317	1.98462	3.939	0.426	0.369
Public Participation	impact from attending meeting	41	3.3902	2.14334	4.594	0.487	0.369
Public Participation	impact from providing input	41	3.0732	1.88932	3.570	0.497	0.369
Local Context	Information impact (collapsed)	36	2.8194	1.63512	2.674	0.587	0.393
Local Context	local media	36	3.2368	1.99234	3.969	0.498	0.383
Local Context	local politics	36	2.5000	1.93465	3.743	1.266	0.393
Local Context	national media	36	2.8684	2.30359	5.307	0.786	0.383
Local Context	family/friends/etc	36	3.1842	2.03822	4.154	0.485	0.383
Local Context*	Egalitarian	38	5.6842	1.54404	2.384	-1.482	0.383
Local Context*	Individualist	38	3.6579	1.81995	3.312	0.399	0.383
Local Context*	Hierarchist	38	4.7632	1.80741	3.267	-0.467	0.383
Personal Values	Biocentic values (collapsed)	39	5.8718	1.28615	1.654	-1.167	0.378
Personal Values	reduce pollution from energy production	39	5.6667	1.59495	2.544	-1.264	0.378
Personal Values	cleaning site	39	6.0270	1.30142	1.694	-1.012	0.378
Personal Values	Egoistic values (collapsed)	36	5.1765	1.54815	2.397	-0.783	0.378
Personal Values	creation of jobs	36	5.2973	1.56107	2.437	-0.758	0.388
Personal Values	reduce energy	36	5.3056	1.83333	3.361	-0.981	0.393
Personal Values	local energy production	36	5.0000	1.84961	3.421	-0.631	0.378
Socio-Demographic	Age	42	60.0000	0.93580	0.876	-0.660	0.378
Socio-Demographic*	Education	41	3.8293	1.13803	1.295	-0.397	0.369
Socio-Demographic*	Income	41	64,500	2.66412	7.098	-0.329	0.369
Socio-Demographic	Duraction of Residency	42	32.9762	16.70328	278.999	0.210	0.365

*variables highlighted are further analyzed

Figure 2:

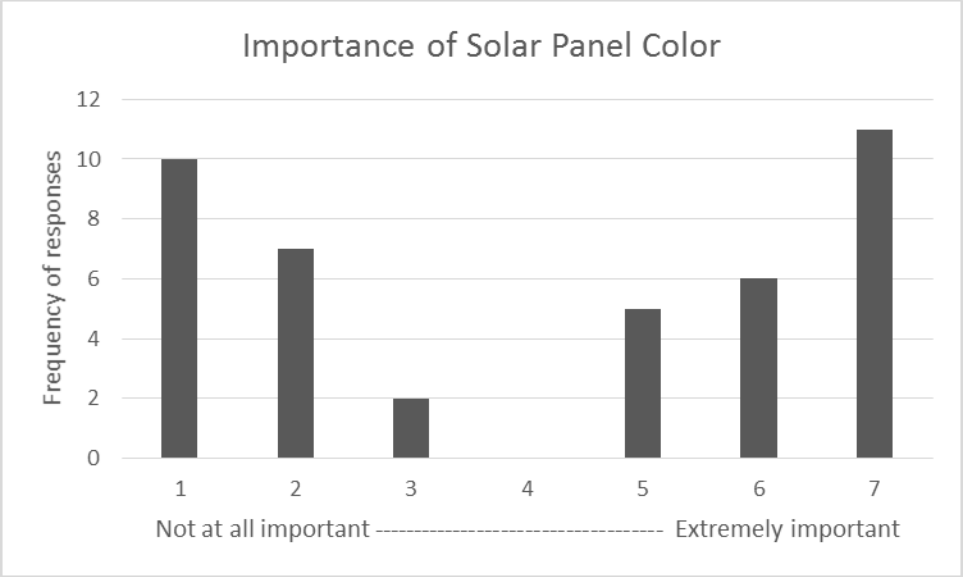
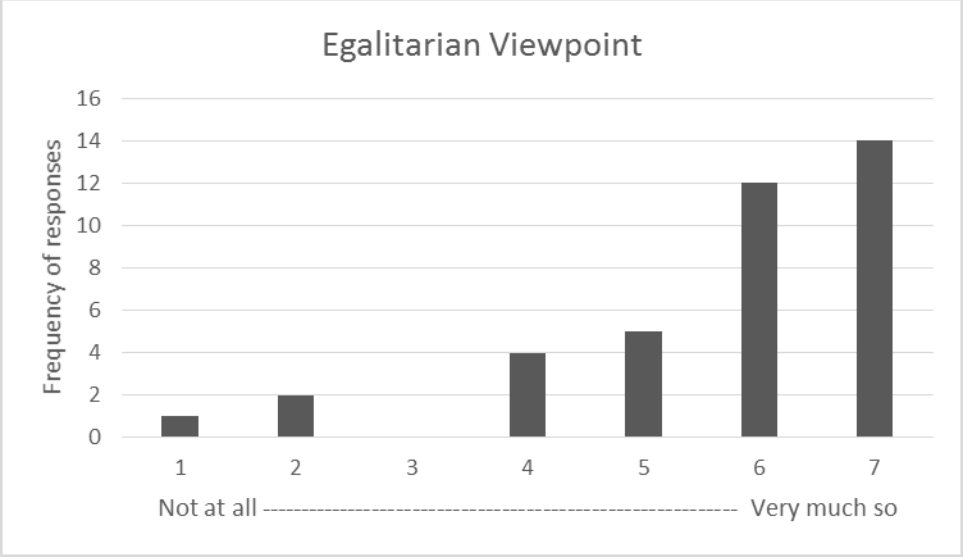


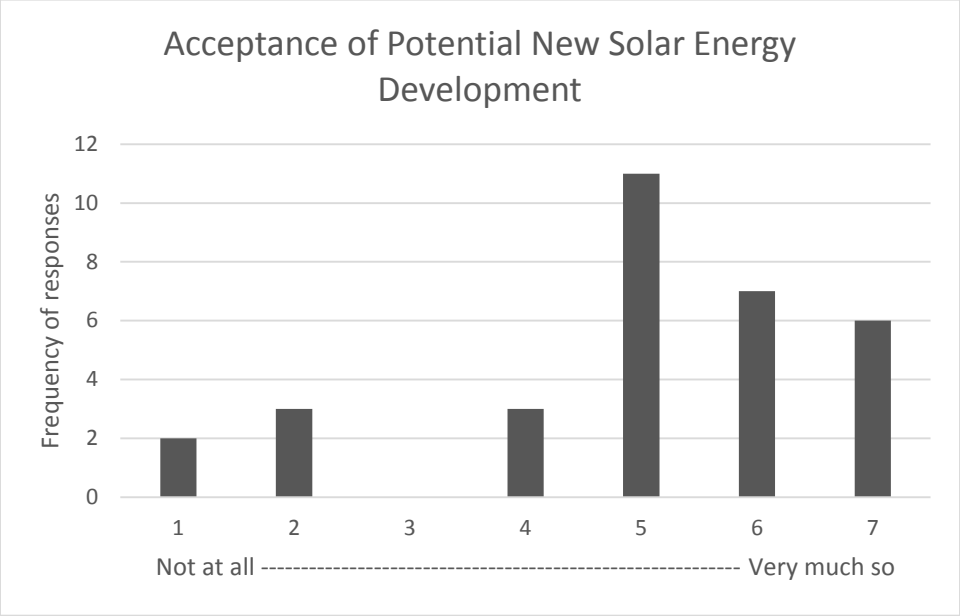
Figure 3:



General Attitudes

Before analyzing the relationship between the various influences and acceptance, the characteristics of the dependent variable, acceptance of the potential new solar energy development, should be examined. The majority of respondents indicated a 5 with a 4.97 mean value and a skewness of -0.982 (*Figure 4*). This indicates that the majority of respondents accepted the potential new solar energy development.

Figure 4:



Relationships between Influences and Acceptance towards the Potential Development

As shown in *Figure 1,* there were five possible influences on acceptance towards the potential solar energy development. The modifiable characteristics that were analyzed are familiarity and appearance. The inherent characters that were analyzed are egalitarian viewpoint, education and income. As shown in *Table 4,* all five of these influences did have a relatively strong relationship with acceptance and their corresponding hypotheses were consistent with the results of this research study. Each of these relationships will be further discussed in the following sections.

Table 4:

Statistics Summary

Influence Category	Variable	Mean	Variance	Skewness	Cronbach's alpha	Correlation Coefficent with Acceptance	Hypothesis Results
General Acceptance	Acceptance of potential new development	4.9688	2.999	-0.982	-	-	-
Spatial	Familiarity of potential new development	3.1892	4.547	0.466	-	0.349	consistent
Spatial	Importance of apperance (collapsed)	4.7683	3.464	-.305	0.890	-0.305	consistent
Spatial	importance of appearance	5.4146	3.199	-1.052	-	-	-
Spatial	solar panel color	4.0976	6.190	-.086	-	-	-
Spatial	solar panel size	4.7317	4.301	-.647	-	-	-
Spatial	placement of solar panels	4.8293	4.345	-.632	-	-	-
Local Context	Egalitarian	5.6842	2.384	-1.482	-	0.558**	supported
Local Context	Individualist	3.6579	3.312	0.399	-	0.326	-
Local Context	Hierarchist	4.7632	3.267	-0.467	-	0.272	-
Socio-Demographic	Education	3.8293	1.295	-0.397	-	0.481**	supported
Socio-Demographic	Income	64,500	7.098	-0.329	-	0.420*	supported

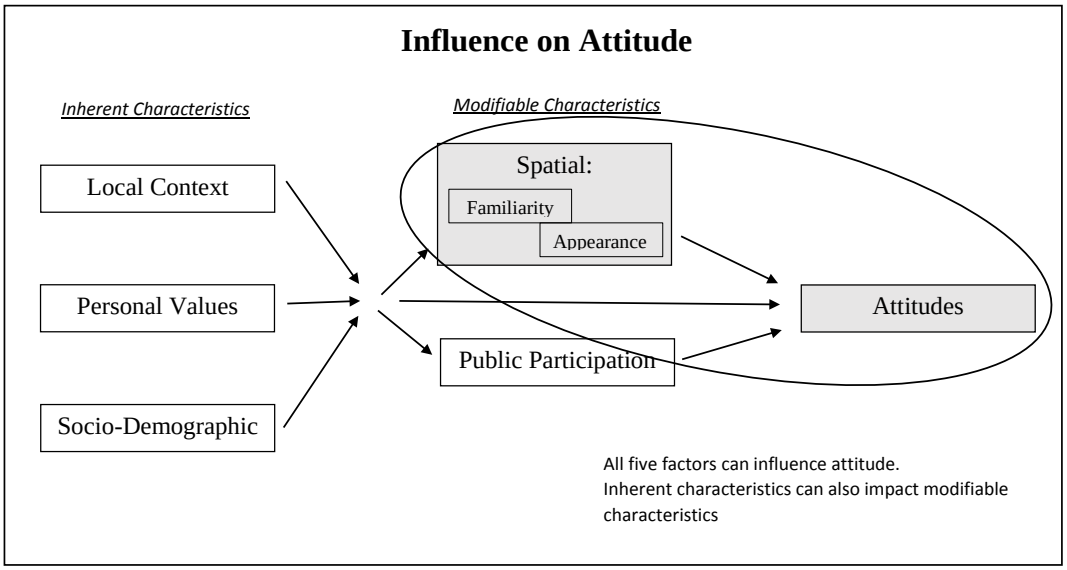
* significant at .05 level

** significant at .01 level

Modifiable Characteristics: Influence on Acceptance

Spatial influences were considered a modifiable characteristics (*Figure 5*) and were analyzed to determine if they have a significant relationship with acceptance of the potential solar energy development. Aspects of these influences include familiarity and importance of the structure's appearance. These are considered modifiable characteristics because they can be adjusted by regulatory and planning policy actions. For example, familiarity is a modifiable characteristics because it can be altered by city planners and developers by providing more information to the public.

Figure 5:



Spatial Influence: Familiarity

Familiarity is an aspect of spatial influences because as proximity to the site increases, it is more likely that you will be more familiar with the development. It is believed that as familiarity increases, acceptance will also increases because the person has more knowledge on the subject. Therefore, it is hypothesized that there would be a positive relationship between familiarity with the potential solar energy development in the community and acceptance of the potential solar energy development. There was a normal distribution of familiarity with a skewness of .466. Spearman's rho was used to determine the strength of the relationship between acceptance and familiarity because both variables are ordinal; the relationship was not statistically significant at the .05 level and the coefficient equaled 0.349 with N=30. Even though there is not a significant relationship between familiarity and acceptance, the relationship is consistent with the hypothesis and the relationship is relatively strong.

Spatial Influence: Appearance

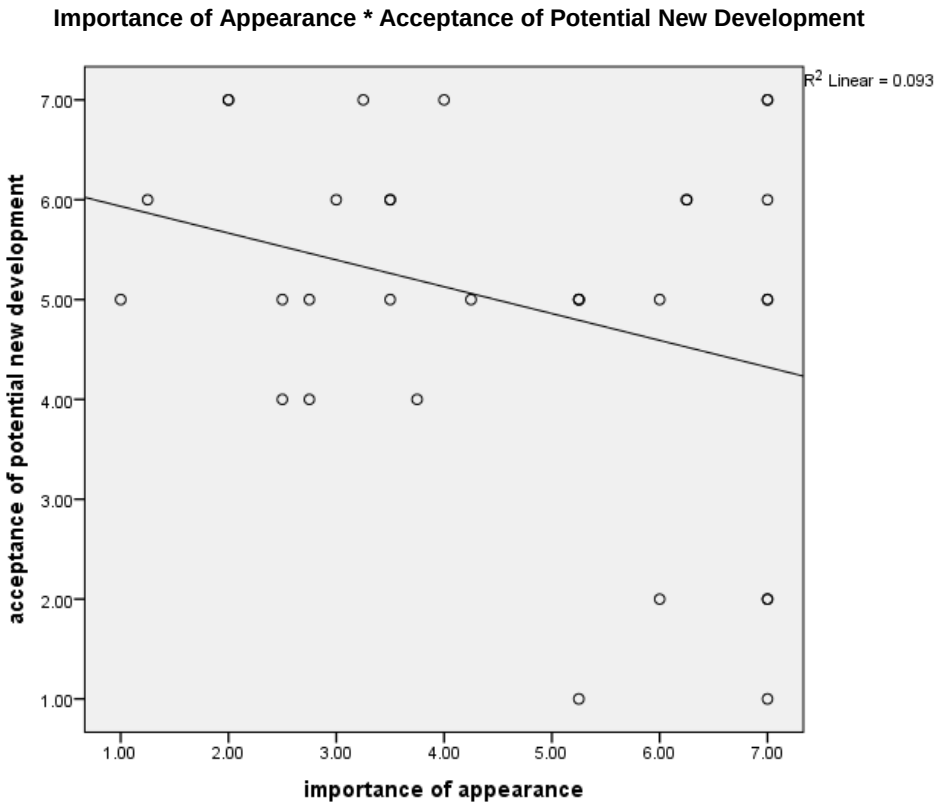
Importance of appearance is another aspect of spatial influences that could potentially influence a person's acceptance towards the potential development. It is hypothesized that the importance of the development structures' appearance is strongly related with the acceptance of the potential solar energy development. Whether there will be a strong positive or strong negative relationship with acceptance towards the potential solar energy development was not specified by the literature.

Four different ordinal aspects of appearance were collapsed together to produce the overall importance of appearance variable: important of appearance, solar panel color solar panel size and solar panel placement. Collapsing these variables together creates a more holistic variable that better encapsulates the importance of the structure's appearance. These variables had a good internal consistency, Cronbach's alpha = .899 with N=41, and a low skewness of -0.305. Pearson's correlation was used between importance of appearance and acceptance of the potential solar energy development. Pearson's correlation was used because the independent variable was continuous since the variable was created by collapsing four ordinal variables and the dependent variable can be treated as continuous because of this variables even distribution and normality. The relationship had a coefficient value of -.305 with N = 32, indicating that the negative relationship is strong but not significant on the .05 level. Therefore, the hypothesis is supported because there does appear to be a strong relationship between importance of appearance and acceptance (*Figure 6*). Furthermore, the nature of the relationship indicates that when the appearance of the structure is more important, then it is more likely the potential development would not be accepted.

Three chi-square test was completed between the different aspects of appearance (color, size and placement of solar panels) and acceptance to determine if these separate aspects had a relationship with acceptance towards the potential solar energy development. The results of these tests did not show a significant relationship between these different aspects of appearance. Also, the three relationships between the aspects of appearance and

acceptance were relatively similar with one another. Therefore, the results of these test did not add to the discussion and were not reported in this study.

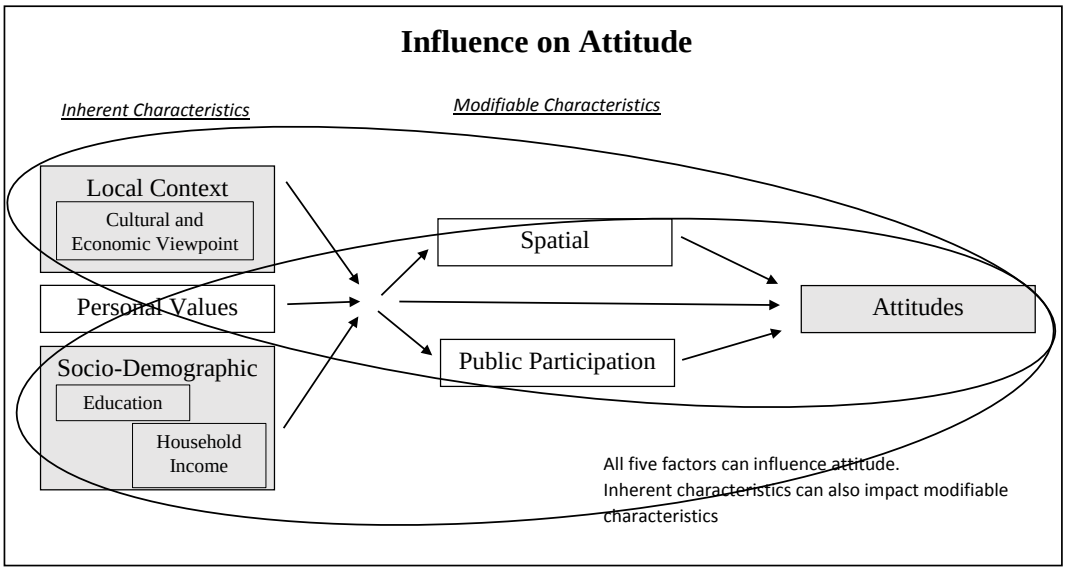
Figure 6



Inherent Characteristics: Influences on Acceptance

Local context influences and socio-demographic influences were considered inherent characteristics because they cannot be altered or are not easily altered. They were analyzed to determine if they have a significant relationship with acceptance of the potential solar energy development (*Figure 7*). Aspects of these influences include egalitarian viewpoint, education and household income.

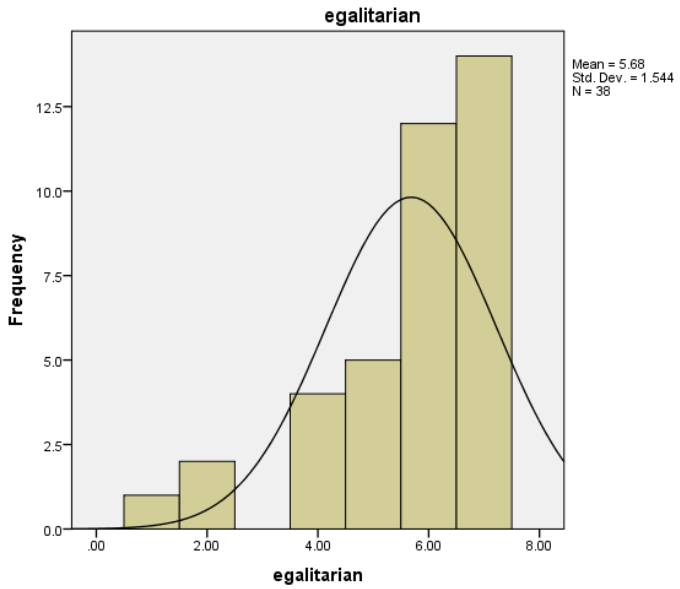
Figure 7:



Inherent Influence: Cultural and Economic Viewpoint

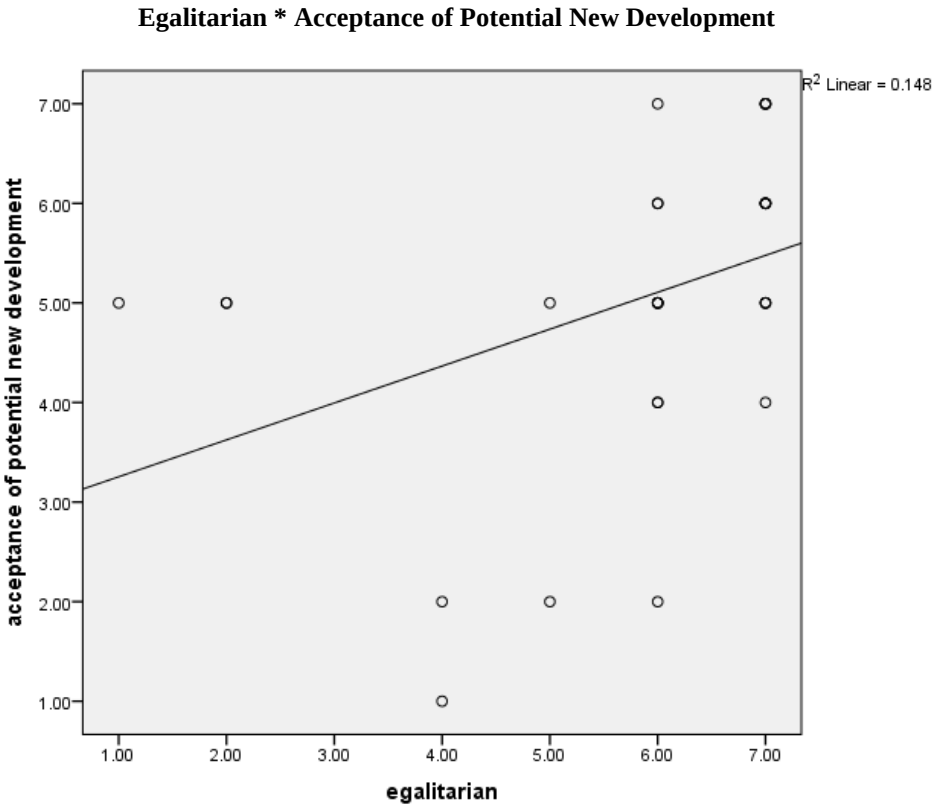
Cultural and economic viewpoints are considered a local context influence because these viewpoints are helped shaped, to some extent, by a person's location. The three cultural and economic viewpoints are individualist, hierarchist and egalitarian. Each of these viewpoints have a differing level of belief that the natural world is vulnerable to human actions. It is hypothesized that egalitarians will have the most significant positive relationship because they believe the natural world is more vulnerable than the other viewpoints. In regards to distribution, the individualist and hierarchist viewpoint are relatively normally distributed, but the egalitarian viewpoint egalitarian is considerably skewed with a skewness of -1.482. The distribution indicates that the majority of respondents identified highly with the egalitarian viewpoint (*Figure 8*).

Figure 8:



Spearman's rho correlation was used to measure the relationship between the different cultural and economic viewpoints and acceptance towards the potential solar energy development. Spearman's rho correlation was run with each viewpoint individually. The egalitarian viewpoint had the strongest positive relationship with acceptance out of the three viewpoints studied. This relationship was most likely affected by the high amount of responses that indicated "highly accurate" and can be seen in *Figure 9.* The coefficient value for egalitarian was 0.558 with N=30, which is significant at the .01 level. The coefficient value for individualist is 0.326 with N=30 and the coefficient value for hierarchist is 0.272 with N=30. These data indicate that the original hypothesis is supported and the egalitarian viewpoint does have a strong positive relationship with acceptance of the potential solar energy development.

Figure 9:



Three chi-square tests of independence were performed to examine the relationship between the three different cultural and economic viewpoint and acceptance towards the potential solar energy development. This test has different assumptions in regards to the distribution of variables and was conducted to see if the skewed distribution of the variables affected the strength of the relationship between the viewpoints and acceptance. Egalitarian viewpoint was expected to have the strongest association with acceptance. However, hierarchist had the strongest association with acceptance. The relation between egalitarian and acceptance were almost significant at the .05 level, χ^2 (25, N = 30) = 34.507, p = .098.

Whereas, the relation between hierarchist and acceptance was significant at the .05 level, χ^2 (30, N = 30) = 34.507, p = .050. Individualist had the weakest association with acceptance, χ^2 (30, N = 30) = 26.450, p = .652. Since the hierarchist viewpoint has the strongest association with acceptance out of the three viewpoints, the hypothesis of egalitarian viewpoint having the strongest association was not supported.

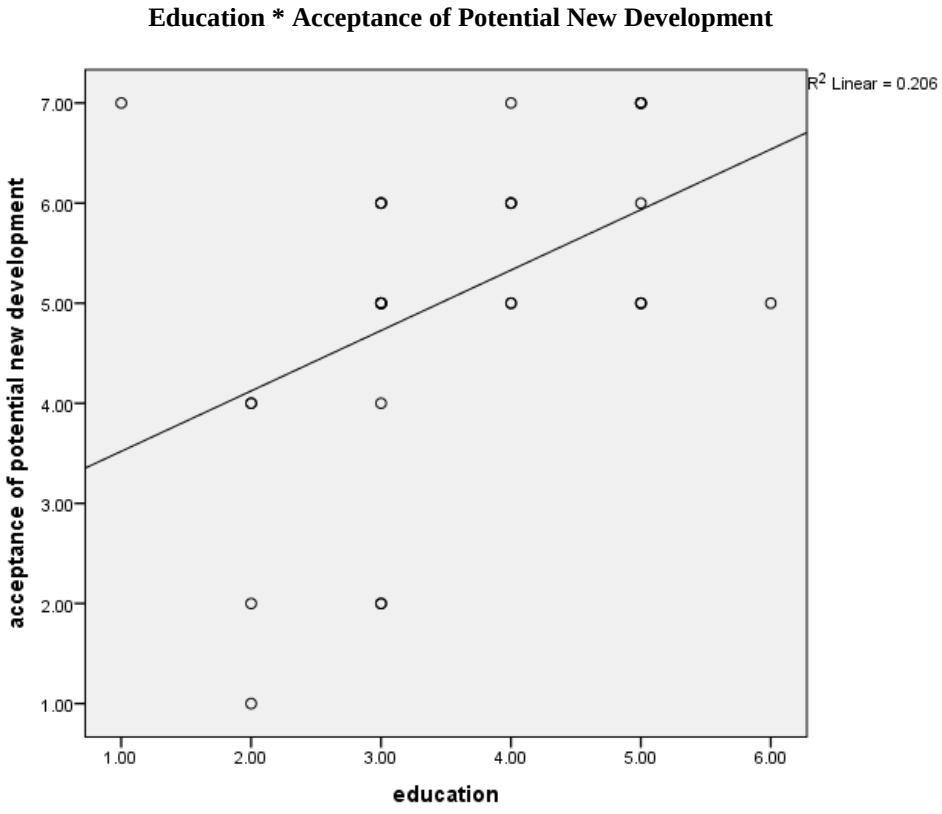
The Spearman's rho correlation and the chi-square test produced different results when analyzing the relationship of the different viewpoints and attitude. Spearman's rho correlation indicated that the egalitarian viewpoint had the strongest relationship with acceptance whereas, the chi-square test indicated that the hierarchist viewpoint had the strongest relationship with acceptance. I am inclined to believe that Spearman's rho correlation is a more accurate test for the relationships tested because not all of the viewpoint relationships have an even distribution and Spearman's rho is more appropriate for skewed variables.

Inherent Influences: Socio-Demographic

Socio-demographic influences are considered inherent characteristics because they are not easily changed. It is hypothesized that certain socio-demographic characteristics will have an impact on acceptance towards a potential solar energy development such as education and household income. Particularly, it is hypothesized that education and household income will have a positive relationship with acceptance towards a potential solar energy development.

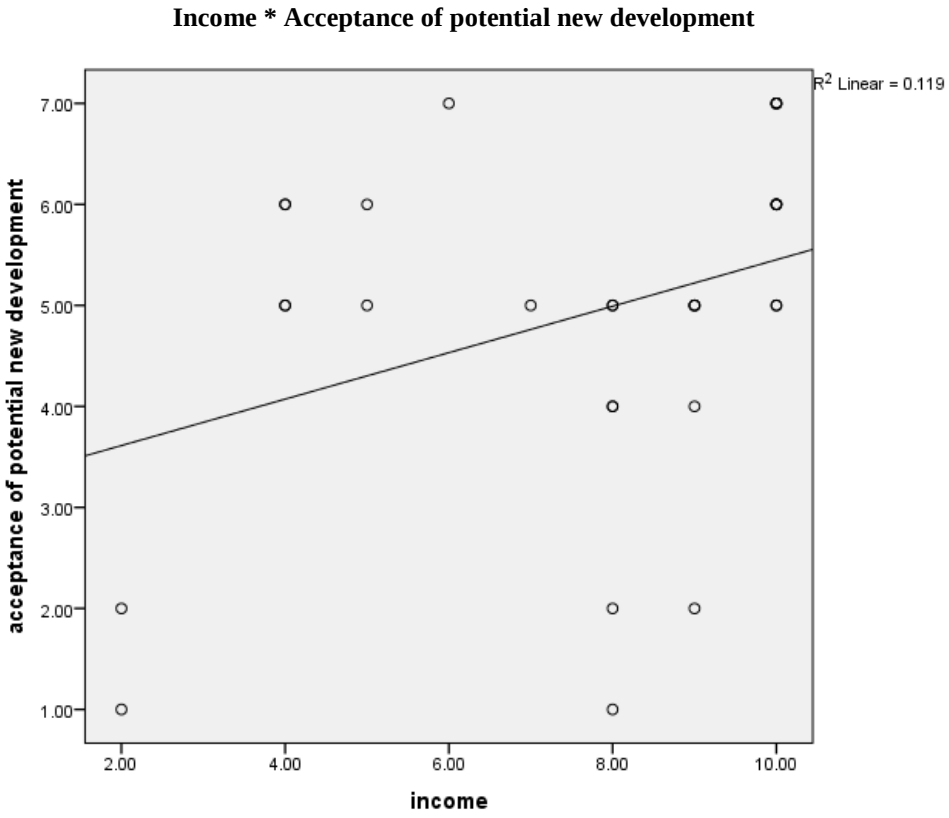
There were a wide range of education levels represented and the variable had a skewness of -0.397. Spearman's rho correlation was used to determine the strength between education and acceptance of a potential solar energy development correlation. The coefficient value is 0.481 with N = 31. This relationship is significant at the .01 level. Since the relationship is statistically significant, the hypothesis stating higher education levels and higher levels of acceptance are related is supported (*Figure 10).*

Figure 10:



Income has a skewness of -.329 and a diverse range of income groups were represented. Spearman's rho correlation was used to determine the strength between education and acceptance of the potential solar energy development. This relationship had a coefficient of 0.420 with N = 31, which is significant at the .05 level. Since the relationship is significant, the hypothesis stating that higher income and higher acceptance are correlated is supported (*Figure 11*).

Figure 11:



Summary

Egalitarian viewpoint, education and income had statistically significant relationships with acceptance and their corresponding hypotheses were supported. All of these relationships represent influences that are considered inherent characteristics. Familiarity and importance of appearance also had strong relationships with acceptance and are considered inherent characteristics. Therefore, both modifiable and inherent characteristics had strong relationships with acceptance towards the potential solar energy development. This is just preliminary quantitative analysis and more analysis should follow, but won't be included in this document because of time constraints.

QUALITATIVE DATA

Qualitative data was used in addition to qualitative analysis to help supplement and better explain data trends. Out of the 42 surveys collected, 12 provided additional comments to allow for further understanding of their responses. Four themes were identified through grouping the responses into obvious categories: unaware of the development, support for the development, concerned about the development, and barriers within the community. Specific coding methods were not used due to time constraints. Six respondents commented about the lack of information/awareness about the development. Five respondents indicated their support for the development and four respondents indicated they were concerned about the development or a specific aspect of the development such as the glare from solar panels. Lastly, four respondents indicated a barrier within the

community such as lack of effectiveness from public meetings and politicians ignoring the issue.

Some respondents commented on more than one of the major themes. Two of the surveys that indicated unawareness also indicated their support for the project. There was no cross over between unawareness and uncertainty. One respondent indicated unawareness and linked his or her unawareness with barriers. Lastly, one respondent had comments that related to both barriers in the public participation process and uncertainty about specific aspects of the development. While this is a very small sample, it indicates that uncertainty and barriers exist in the communities studied. It also indicates that respondents were concerned about the appearance of the development and the lack of effectiveness in the public participation process. Overall, there appears to be a relatively equal amount of support and concern for the development from the comments provided in the survey.

DISCUSSION of QUANTITATIVE and QUALITATIVE DATA

The purpose of this study was to determine what factors influence people's attitudes towards a brownfield to brighfield site with their local community through the RE-Power America's Land Initiative. Respondents, who are older and whiter than their communities' population, believed that a brighfield would be accepted in the community. Certain influences had a stronger relationship with acceptance. These influences were divided into modifiable and inherent characteristics to determine if action and policy can affect attitude towards the potential solar energy development. Egalitarian viewpoint, education and

income were all considered inherent characteristics and had the strongest relationship with acceptance. However, modifiable characteristics such as familiarity and appearance also had strong relationships with appearance. In this section, the quantitative analysis and qualitative analysis are discussed in regards to the broader context and in relation to previous literature.

MODIFIABLE CHARACTERISTICS

Spatial influences are modifiable characteristics because they can be altered through certain actions. Familiarity and appearance of the structure proved to be important among resident responses and had a strong, but not statistically significant relationship with acceptance. Familiarity had a slightly stronger relationship with acceptance than appearance, but its influence on the relationship was in different direction. Familiarity had a positive relationship while, appearance had a negative relationship with acceptance towards the potential solar energy development.

Familiarity

There was a range of familiarity about the potential brightfield and a relatively strong relationship between familiarity and acceptance, but not quite statistically significant. As familiarity increases, so did acceptance. Sovacool and Ratan (2012) predicted this phenomenon; when the community has less information then they are less likely to accept the solar energy development. The respondent pool appears to follow this trend. However, it is unclear if familiarity or acceptance of the development occurred first. Persons who

have more information about the site could be more likely to accept it because they are knowledgeable. It is also possible that that they are knowledgeable about the site because they accept the development and were interested in the details. Studying this phenomenon in greater detail could provide future insight into how familiarity and acceptance relate and affect one another.

Appearance

Appearance of the development was very important to the communities. As the importance of appearance increased, acceptance of the project declined. This relationship indicate that persons who are concerned about the aesthetics of the site and the project's cohesiveness with the community are more likely to reject the development. The notion is further supported by a comment from one of the respondents which illustrates the concern with how the development will fit into the surrounding: "if the farm is out of view, hidden by trees, it can be as close as they want it to be. The wife loves to see out the windows of the back of the house. If I had to see them when looking out the living room window- yech. Back window – a – ok." This comment suggests that solar energy developments are aesthetically displeasing and community members would prefer to conceal the development as much as possible, affirming Torres-Sibille et al. (2009) and Letang Taylor (2012) previous postulations.

INHERENT CHARACTERISTICS

Local context and socio-demographic influences are inherent characteristics because they are difficult or impossible to change. In regards to local context, the three different cultural and economic worldview had various degrees of strength in their relationships with acceptance. Egalitarian viewpoints had the strongest relationship with acceptance when using Spearman rho's correlation, as predicted. Literature predicted that socio-demographic characteristics would not influence attitude on their own and needs to be compounded with other factors to have an impact on attitude. However, education and household income proved to have a significant relationship with acceptance.

Cultural and Economic Viewpoints

The respondent pool who were older and whiter than their communities, identified strongest with an egalitarian viewpoint followed by hierarchist and then individualist. This trend indicates that people strongly identified with the more ecologically centered viewpoints; these viewpoints suggest that our natural world is vulnerable to human actions. All three viewpoints had a positive relationship with acceptance, but egalitarians (those who believed that nature is vulnerable to human activities) had a statistically significant correlation with acceptance. Indicating that persons who believe that the natural environment is more vulnerable are more likely to accept the brightfield development. However, there is not a direct correlation with a person's viewpoint on nature's vulnerability and his or her acceptance of renewable energy developments such as brightfields. The individualist viewpoint has a stronger positive relationship with

acceptance than hierarchist. Essentially, identifying with egalitarian viewpoints does have a strong correlation with acceptance, but there is not a direct correlation between believing that nature is vulnerable and acceptance towards the potential solar energy development.

Education and Household Income

Both education and household income did have a significant positive relationship with acceptance. Education's relationship was slightly stronger with acceptance than household income. This study follows previous literature that postulated those with higher education are more knowledgeable and open minded about environmental concerns (Steel et al. 2015; Bidwell, 2013). It is possible that education had a stronger relationship with acceptance because the person's attitude is influenced more by their education and knowledge background on the issue rather than their current occupation and income level.

IMPLICATIONS

Out of all the factors analyzed, the most influential factors for the survey respondents' attitudes towards accepting the solar energy development are inherent characteristics: egalitarian viewpoint, education and household income. However, other factors had a relatively strong relationship with acceptance, although not significant, such as familiarity and the development structures' appearance. Out of all of these influences planners, agencies and developers have control over the communities' familiarity with the potential solar energy development and the appearance of the development. Therefore, these entities

need to focus their energy towards increasing familiarity and ensuring a pleasing aesthetic of the structure to help increase acceptance of the potential development.

Only certain sites can house a brightfield site due to various requirements such as being a brownfield. Therefore, in order for the brightfield site to qualify under the RE-Power America's Initiative, resources need to be focused on making the specified site work for the stakeholders involved. It is possible to make the development more attractive to residents through design choices. The respondents overwhelmingly believe that the appearance of the development is important for the potential development and should therefore be addressed when designing the development. Not only should the design promote efficient solar energy production, but precautions need to be taken so that the development blends in with the community and the natural surroundings as much as possible to limit intrusion (visual and otherwise). Specifically, the placement of the solar panels need to be considered carefully and placed in a way that limits their visibility to the community and to prevent the glare from becoming a safety hazard. Essentially, the project's design needs to balance efficiency and aesthetics to prevent backlash from the community.

Another concern is the lack of familiarity about the project. Increased familiarity can be accomplished through a more effective public participation process and increasing awareness of public meetings, but other information sources need to contribute as well. In addition, public officials and developers could engage the issue more to increase awareness

of the potential development. As familiarity of the potential development increases, then community members are more likely to attend public meetings and provide their input, which could increase the project's acceptance because it is tailored to their community.

Factors in this study that had a statistical significance with acceptance but are not controllable by planners or developers include egalitarian viewpoints, education and household income. While these factors are not in the direct purview of planners and developers, it is believed that higher levels of education are related with increased acceptance because of the knowledge that higher education provided about alternative energy sources. Therefore, increasing the information available about the site and educating residents on solar energy may increase acceptance just as much as higher levels of education increased acceptance towards the potential solar energy development.

CONCLUSION

This study analyzed what factors influence a person's attitude towards a brownfield site converted into a future solar energy farm through the RE-Power America's Land Initiative to help increase the success of implementing solar energy farms in cities. To gain a better understanding of the topic, literature reviewed to reveal the factors that influence attitudes towards brownfields and solar energy farms individually. These include spatial, public participation, local context, personal values, and socio-demographic factors. To analyze their potential influence on attitude, residents' views in Brisbane, California and

Lackawanna, New York were gathered through mail and online surveys. Using descriptive statistics and measures of association to study the respondent pool, who were older and whiter than their communities' characteristics, it was determined that both modifiable characteristics and inherent characteristics had strong relationships with acceptance towards the potential solar energy development. Ultimately the influences that had the strongest relationship with acceptance were inherent characteristics: egalitarian viewpoint, education and income. Other factors such as familiarity and appearance of the structure also had a strong relationship and are considered modifiable characteristics. Future policies and procedures in the RE-Power America's Land Initiative projects located in Brisbane, California and Lackawanna, New York should focus on the modifiable characteristics by designing a development that is cohesive with the surroundings and providing more information to the public to increase awareness. These actions should influence the acceptance of the future brightfield developments for the survey respondent sample.

APPENDICES

Appendix A: Letter of Information (Lackawanna, NY)

ATTITUDES TOWARDS SOLAR ENERGY FARMS

Dear Lackawanna Resident,

Thank you for your interest in completing this survey! Caitlin Dyckman, J.D., PhD. and Brittni Olesen are inviting you to take part in a research study. Brittni Olesen is a student at Clemson University and running this study with the help of Caitlin Dyckman. This research will benefit the research teams understanding of the subject and help fulfill the requirements for Brittni Olesen's Master's Degree in City and Regional Planning at Clemson University.

The questions in this survey pertain to attitudes towards a possible future solar energy farm located on a previously contaminated site within your community. Specifically, this study focuses on the different factors that influence attitudes in regards to this topic. Your input is very important and will help others understand your views regarding this topic including your city and the Environmental Protection Agency (EPA). All survey responses are confidential. Before starting the survey please review the consent information below. It should take you about 10 to 15 minutes to complete the survey. When you are finished filling out the survey, please enclose the completed survey and consent form in the provided pre-stamped, pre-addressed envelope and return it to a postal facility.

We do not know of any risks, discomforts, or direct benefits to you by partaking in this research study. We will do everything we can to protect your privacy and confidentiality. We will not tell anybody outside of the research team that you were in this study or what information we collected about you in particular. You do not have to be in this study. You may choose not to take part and you may choose to stop taking part at any time. You will not be punished in any way if you decide not to be in the study or to stop taking part in the study.

Contact Information

If you have any questions or concerns about the survey, please contact Brittni Olesen at Clemson University through email at bolesen@clemson.edu or Caitlin Dyckman, J.D., PhD. at cdyckma@clemson.edu.

If you have any questions or concerns about your rights in this research study, please contact the Clemson University Office of Research Compliance (ORC) at 864-656-0636 or irb@clemson.edu. If you are outside of the Upstate South Carolina area, please use the ORC's toll-free number, 866-297-3071.

Consent

By taking part in this study, you are agreeing that you have read this form and have been allowed to ask any questions you might have.

Appendix B: Survey (Brisbane, CA)

For each question, please circle the number or symbol that best fits your answer.

Please review the definitions prior to each section in this survey. The definitions further explains concepts that are associated with that respective section of the survey.

Section 1: General Attitude Towards Solar Energy Farms

Definitions:

Attitude = your expressed favor or disfavor towards an idea or object

Brownfield = real property, the expansion, redevelopment or resuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant or contaminant Example: landfill, industrial site, manufacturing plant

Solar Energy Farm = an installation of solar panels extending over one acre in order to generate electricity through solar energy, which is a form of renewable energy

	Not at all ← → Very much so							Do not know
1. How familiar are you with the potential solar energy development on the Brisbane Baylands site along Bayshore Boulevard within your community?	1	2	3	4	5	6	7	X
2. How much was the Brisbane Baylands site's previous municipal landfill and railroad land use beneficial to the community, if at all?	1	2	3	4	5	6	7	X
3. How much will the nearby neighborhoods, as a whole, accept the presence of a solar energy farm?	1	2	3	4	5	6	7	X
4. How much will the solar energy farm impact your household?	1	2	3	4	5	6	7	X
5. How much will the solar energy farm impact yourself?	1	2	3	4	5	6	7	X

Please write down any further comments you would like to share:

Section 2: Attitude towards Solar Energy Farms' Design and Proximity

Below are several pictures of solar energy farms. Please reference these pictures when you are answering the questions or responding to the statements within this section.

	Not at all Important ⟷ Extremely Important							Do not know
6. How important to you is the <u>appearance of the structures</u> affiliated with the solar energy farm in your community?	1	2	3	4	5	6	7	X
7. How important are the following aspects of the project to you?								
a. Color of the solar panels	1	2	3	4	5	6	7	X
b. Size of the solar panels	1	2	3	4	5	6	7	X
c. Placement of solar panels (i.e., ground or roof mounted)	1	2	3	4	5	6	7	X
	Decrease Value ⟷ Increase Value							Do not know/ No effect
8. How will the solar energy farm affect your property value?	1	2	3	4	5	6	7	X
	Strongly Disagree ⟷ Strongly Agree							Do not know
9. I would prefer that the solar energy site is built at least 5 miles from my residence.	1	2	3	4	5	6	7	X
	Rarely ⟷ Often							Do not know
10. How often do you drive by the site?	1	2	3	4	5	6	7	X

Please write down any further comments you would like to share:

Section 3: Attitude towards Participation

Definition:

Public Participation = Part of the democratic process where interested members of the community and other stakeholders engage a specific issue. Some forms of public participation include attending public meetings and contacting government officials

	Not at all ← → Often							Do not know
11. How often have you personally participated in any public meeting?	1	2	3	4	5	6	7	X
12. How often have you personally participated in a public meeting where the agenda directly impacted your personal interests?	1	2	3	4	5	6	7	X
13. How often do you actively provide input (offer information, state your opinion, etc.) in public meetings?	1	2	3	4	5	6	7	X
	Not at all Impactful ← → Extremely Impactful							Do not know
14. How much do you believe your attendance makes an impact on the decisions reached at the meetings?	1	2	3	4	5	6	7	X
15. How much do you believe your input makes an impact on the decisions reached at the meetings?	1	2	3	4	5	6	7	X
	Much Less Time ← → Much More Time							Do not know
16. Did the process to reach a decision take more time than expected?	1	2	3	4	5	6	7	X
	Viewed More Negatively ← → Viewed More Positively							Do not know
17. How much did the experience of participating in the planning process impact your view of the solar energy farm?	1	2	3	4	5	6	7	X
18. Do you know anyone who has participated in a public meeting concerning solar energy sites or brownfields at the Brisbane Baylands site?	Yes					No		X

Please write down any further comments you would like to share:

Section 4: Source of Information on Renewable Energy

Definition:

Renewable Energy = energy from a source that is not depleted when used, such as wind or solar power

	Not at all ⟷ Extremely							Do not know
19. How informed do you feel about the potential solar energy farm at the Brisbane Baylands site?	1	2	3	4	5	6	7	X
20. Which of the following sources have informed, and to what extent have they informed your general opinion of solar energy farms? Check all that apply and rate on a scale of 1 to 7	No Influence ⟷ Extremely Influential							Do not know
☐ a. Local media	1	2	3	4	5	6	7	X
☐ b. Local politics	1	2	3	4	5	6	7	X
☐ c. National media	1	2	3	4	5	6	7	X
☐ d. Family/ friends/ neighbors opinion	1	2	3	4	5	6	7	X
☐ e. Other:_____ (fill in the blank)		2	3	4	5	6	7	X

Please write down any further comments you would like to share:

Section 5: Personal Values

Definition:

Human Activity = Something that people do or cause to happen

21. How closely do the phrases below describe your worldview?	Not Accurate ←						→ Highly Accurate	Do not know
a. I believe that nature is tolerant of human activities	1	2	3	4	5	6	7	X
b. I believe that nature is vulnerable to human activities	1	2	3	4	5	6	7	X
c. I believe that natural systems can withstand some degree of human activities	1	2	3	4	5	6	7	X
22. How important are the following to you in your community?	Not at all Important ←						→ Extremely Important	Do not know
a. Creation of jobs	1	2	3	4	5	6	7	X
b. Reducing pollution from energy production	1	2	3	4	5	6	7	X
c. Reduced energy costs	1	2	3	4	5	6	7	X
d. Cleaning site contaminates	1	2	3	4	5	6	7	X
e. Local energy production	1	2	3	4	5	6	7	X

Please write down any further comments you would like to share:

Section 6: Land Use Preferences

23. Based on the land use choices below, how much do you prefer the following type of land uses on the Brisbane Baylands site?	Strongly Oppose ←						→ Strongly Prefer	Do not know
a. Additional housing	1	2	3	4	5	6	7	X
b. Solar energy farm	1	2	3	4	5	6	7	X
c. Park	1	2	3	4	5	6	7	X
d. Shopping center	1	2	3	4	5	6	7	X
e. Office park	1	2	3	4	5	6	7	X

Please write down any further comments you would like to share:

For each question, please fill in the blank or check the box that best fits your answer

Section 7: Socio-Demographic Factors

24. What is your age? (check one)

- ☐ 18 to 24 years old
- ☐ 25 to 34 years old
- ☐ 35 to 44 years old
- ☐ 45 to 54 years old
- ☐ 55 to 64 years old
- ☐ 65 to 74 years old
- ☐ 75 years or older

25. What is your gender? (check one)

- ☐ Male
- ☐ Female

26. What is the highest level of formal education you have completed? (check one)

- ☐ Less than high school
- ☐ Some high school or equivalent (e.g. GED)
- ☐ Some college, but no degree
- ☐ Associate degree
- ☐ Bachelor degree
- ☐ Graduate degree

27. Which category best describes your annual household income in U.S. dollars? (check one)

- ☐ Less than $10,000
- ☐ $10,000 - $19,999
- ☐ $20,000 - $29,999
- ☐ $30,000 - $39,999
- ☐ $40,000 - $49,999
- ☐ $50,000 - $59,999
- ☐ $60,000 - $69,999
- ☐ $70,000 - $79,999
- ☐ $80,000- $90,000
- ☐ More than $90,000

28. What is your race/ethnicity? (check all that apply)

- ☐ American Indian
- ☐ Asian/ Pacific Islander
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ White
- ☐ Other

29. Including yourself, how many persons are in your household? _____ persons

30. Do you rent or own your home/apartment? (check one)

- ☐ Own
- ☐ Rent

31. How long have you lived in the community? _____ years

Appendix C: Reminder Postcards (Lackawanna, NY)

First Reminder Postcard:

You recently received a mail survey. The questions in this survey pertain to attitudes towards a possible future solar energy farm located on a previously contaminated site within your community. Specifically, this study focuses on the different factors that influence attitudes in regards to this topic.

Your input is very important and will help others understand your views regarding this topic including your city and the Environmental Protection Agency.

Please take a moment to complete and return the survey in the enclosed stamped self-addressed envelope. If you have already returned the survey, please disregard this postcard and the researchers truly appreciate your assistance.

Thank you for your timely participation in this study!

Best Regards,

Your input is greatly appreciated!

Second Reminder Postcard:

You recently received a mail survey. The questions in this survey pertain to attitudes towards a possible future solar energy farm located on a previously contaminated site within your community. Specifically, this study focuses on the different factors that influence attitudes in regards to this topic.

Your input is very important and will help others understand your views regarding this topic including your city and the Environmental Protection Agency.

Please take a moment to complete and return the survey in the enclosed stamped self-addressed envelope by **March 17th**. If you have already returned the survey, please disregard this postcard and the researchers truly appreciate your assistance.

For your convenience, you may choose to complete the survey online at https://www.surveymonkey.com/r/WQQQV5H.

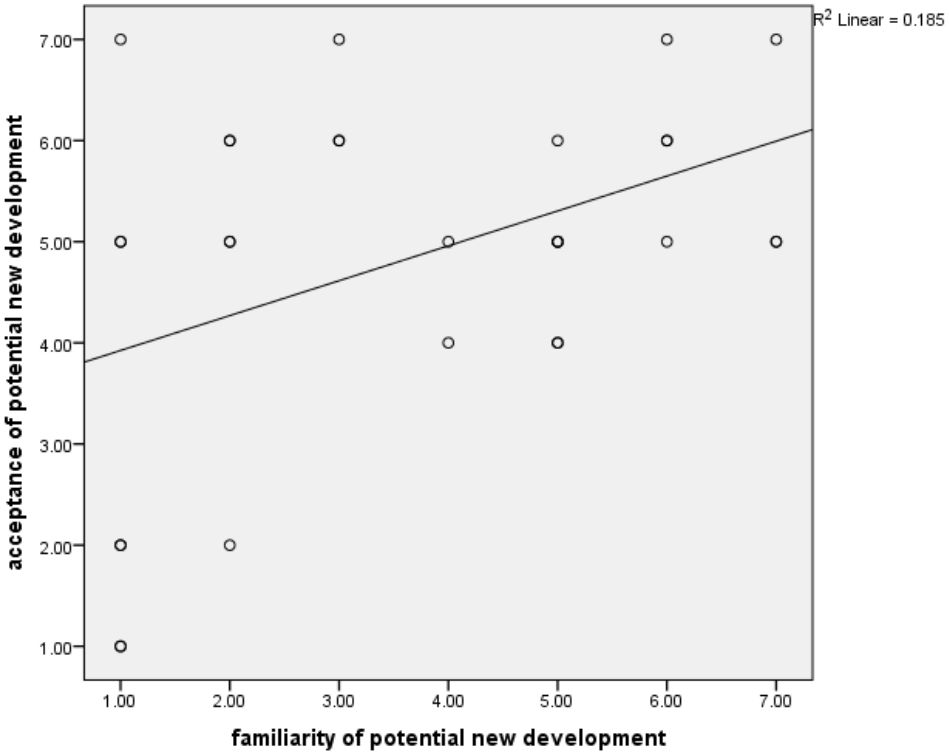
Thank you for your timely participation in this study!

Best Regards,

Your input is greatly appreciated!

Appendix D: Tables and Figures

Familiarity of Potential New Development * Acceptance of Potential New Development



Familiarity of Potential New Development * Acceptance of Potential New Development

Crosstabulation

Count

		acceptance of potential new development						Total
		1.00	2.00	4.00	5.00	6.00	7.00	
familiarity of potential new development	1.00	2	2	0	2	0	1	7
	2.00	0	1	0	2	2	0	5
	3.00	0	0	0	0	2	1	3
	4.00	0	0	1	1	0	0	2
	5.00	0	0	2	3	1	0	6
	6.00	0	0	0	1	2	1	4
	7.00	0	0	0	2	0	1	3
Total		2	3	3	11	7	4	30

Egalitarian * Acceptance of Potential New Development Crosstabulation

Count

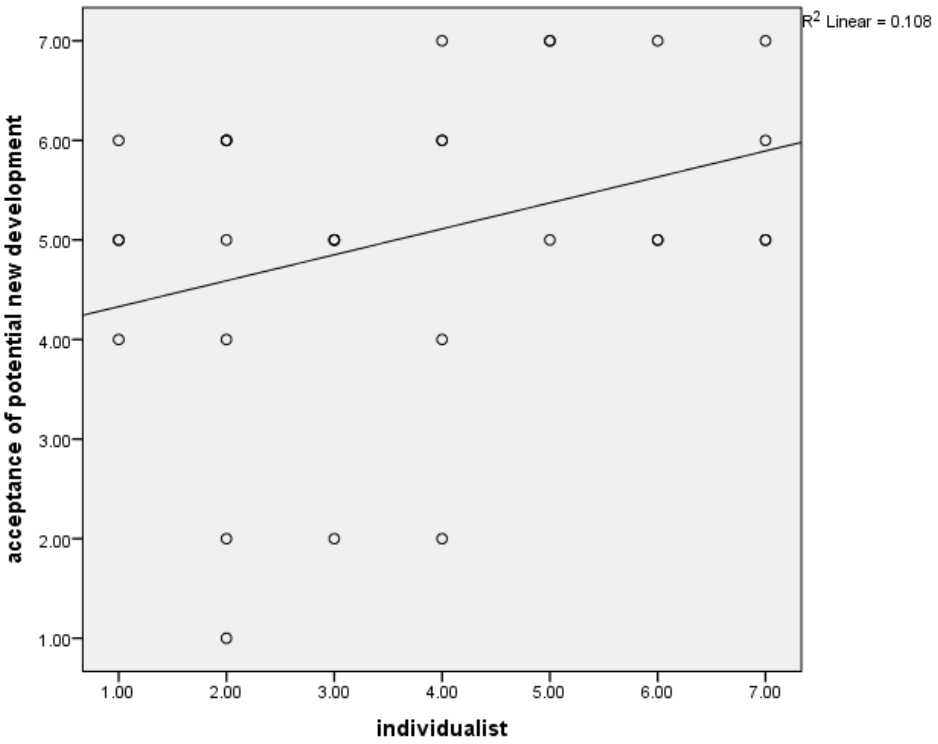
		acceptance of potential new development						
		1.00	2.00	4.00	5.00	6.00	7.00	Total
egalitarian	1.00	0	0	0	1	0	0	1
	2.00	0	0	0	2	0	0	2
	4.00	1	1	0	0	0	0	2
	5.00	0	1	0	1	0	0	2
	6.00	0	1	2	4	2	1	10
	7.00	0	0	1	3	5	4	13
Total		1	3	3	11	7	5	30

Chi-Square Tests: Egalitarian Viewpoint and Acceptance of New Potential New Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.507[a]	25	.098
Likelihood Ratio	26.924	25	.360
Linear-by-Linear Association	4.300	1	.038
N of Valid Cases	30		

a. 36 cells (100.0%) have expected count less than 5. The minimum expected count is .03.

Individualist * Acceptance of Potential New Development



Individualist * Acceptance of Potential New Development Crosstabulation

Count

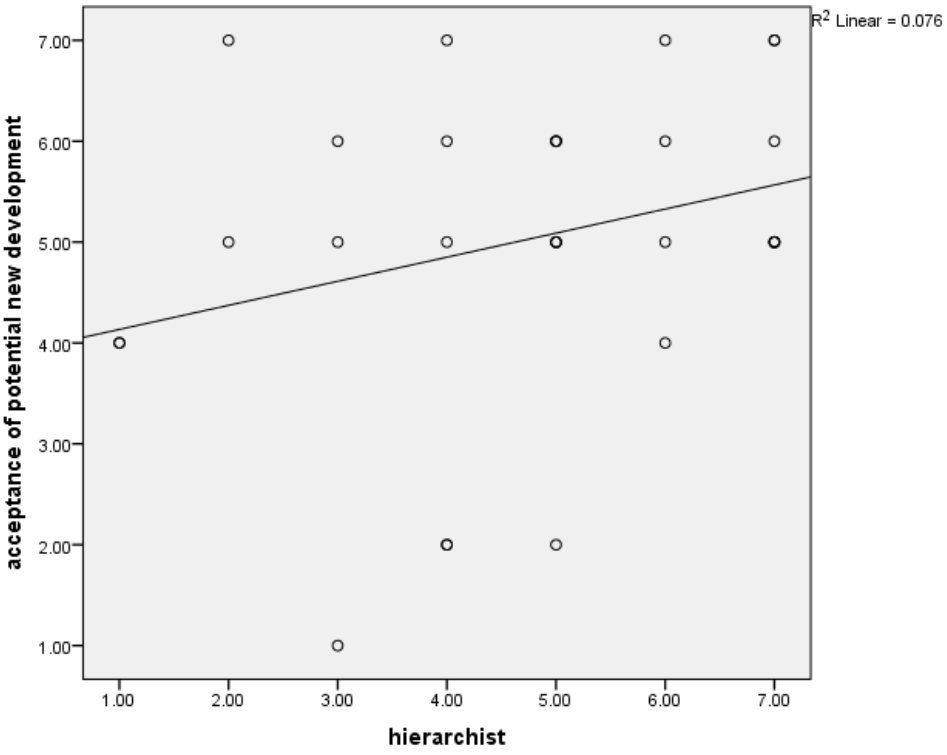
		acceptance of potential new development						Total
		1.00	2.00	4.00	5.00	6.00	7.00	
individualist	1.00	0	0	1	2	1	0	4
	2.00	1	1	1	1	3	0	7
	3.00	0	1	0	3	0	0	4
	4.00	0	1	1	0	2	1	5
	5.00	0	0	0	1	0	2	3
	6.00	0	0	0	2	0	1	3
	7.00	0	0	0	2	1	1	4
Total		1	3	3	11	7	5	30

Chi-Square Tests: Individualist Viewpoint and Acceptance of New Potential New Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.450[a]	30	.652
Likelihood Ratio	32.052	30	.365
Linear-by-Linear Association	3.137	1	.077
N of Valid Cases	30		

a. 42 cells (100.0%) have expected count less than 5. The minimum expected count is .10.

Hierarchist * Acceptance of potential new development



Chi-Square Tests: Hierarchist Viewpoint and Acceptance of New Potential New Development

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43.777[a]	30	.050
Likelihood Ratio	33.582	30	.298
Linear-by-Linear Association	2.203	1	.138
N of Valid Cases	30		

a. 42 cells (100.0%) have expected count less than 5. The minimum expected count is .07.

Hierarchist * Acceptance of Potential New Development Crosstabulation

Count

		acceptance of potential new development						
		1.00	2.00	4.00	5.00	6.00	7.00	Total
hierarchist	1.00	0	0	2	0	0	0	2
	2.00	0	0	0	1	0	1	2
	3.00	1	0	0	1	1	0	3
	4.00	0	2	0	1	1	1	5
	5.00	0	1	0	3	3	0	7
	6.00	0	0	1	1	1	1	4
	7.00	0	0	0	4	1	2	7
Total		1	3	3	11	7	5	30

Education * Acceptance of Potential New Development Crosstabulation

Count

	acceptance of potential new development						
	1.00	2.00	4.00	5.00	6.00	7.00	Total
less than high school	0	0	0	0	0	1	1
high school degree	1	1	2	0	0	0	4
some college	0	2	1	5	3	0	11
Associate degree	0	0	0	2	3	1	6
Bachelor degree	0	0	0	3	1	4	8
Graduate degree	0	0	0	1	0	0	1
Total	1	3	3	11	7	6	31

Income * Acceptance of Potential New Development Crosstabulation

Count

	acceptance of potential new development						
	1.00	2.00	4.00	5.00	6.00	7.00	Total
10,000-19,999	1	1	0	0	0	0	2
30,000-39,999	0	0	0	2	2	0	4
40,000-49,999	0	0	0	1	1	0	2
50,000-59,999	0	0	0	0	0	1	1
60,000-69,999	0	0	0	1	0	0	1
70,000-79,999	1	1	2	2	0	0	6
80,000-90,000	0	1	1	3	0	0	5
90,000+	0	0	0	2	4	4	10
Total	2	3	3	11	7	5	31

Correlations: Pearson

		acceptance of potential new development	importance of appearance
acceptance of potential new development	Pearson Correlation	1	-.305
	Sig. (2-tailed)		.090
	N	32	32
importance of appearance	Pearson Correlation	-.305	1
	Sig. (2-tailed)	.090	
	N	32	41

Correlations

			acceptance of potential new development	familiarity of potential new development	egalitarian	education	income
Spearman's rho	acceptance of potential new development	Correlation Coefficient	1.000	.349	.558**	.481**	.420*
		Sig. (2-tailed)		.059	.001	.006	.019
		N	32	30	30	31	31
	familiarity of potential new development	Correlation Coefficient	.349	1.000	.165	-.122	.335*
		Sig. (2-tailed)	.059		.358	.478	.046
		N	30	37	33	36	36
	egalitarian	Correlation Coefficient	.558**	.165	1.000	-.125	.423**
		Sig. (2-tailed)	.001	.358		.463	.008
		N	30	33	38	37	38
	education	Correlation Coefficient	.481**	-.122	-.125	1.000	-.096
		Sig. (2-tailed)	.006	.478	.463		.554
		N	31	36	37	41	40
	income	Correlation Coefficient	.420*	.335*	.423**	-.096	1.000
		Sig. (2-tailed)	.019	.046	.008	.554	
		N	31	36	38	40	41

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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