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Renewable Energy Integration: Correlating Homeowner Motivations

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Renewable Energy Integration: Correlating Homeowner Motivations and Preferred Leadership Behaviors

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Dedication

There may be many who read this dedication and manuscript, but there is only one other person who truly understands this personal journey . . .

This volume of research is dedicated to my father, Anthony J. Forrest, the most influential leader that I will ever know. Because of your guidance, commitment, and imagination for my success, what was once inconceivable is now a reality. Through your unwavering example, I truly believe that with hard work and focus, I can do anything. Your message, "preparation makes performance easy, but success will never come without adversity," will forever be timeless, and this accomplishment is the ultimate testimony to that wisdom. Thank you, Dad.E.O., we did it!

Love,

Casey

Biographical Sketch

Casey Jerome Forrest was born April 14, 1979 in Mount Airy, North Carolina. In 2006 he earned a Master of Business Administration degree from Winston-Salem State University. In 2002 he earned a Management Information Systems degree from Winston-Salem State University. Mr. Forrest is a business and technology professional, and has worked in the Information Technologies Department at the University of North Carolina School of the Arts since 2001.

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Abstract

The purpose of this quantitative correlational study was to explain the relationship between homeowners' preferred leadership style and their motivation to use sustainable energy. This study utilized a quantitative correlational methodology. The researcher developed and administered a questionnaire to collect data from a convenience sample of faculty and staff homeowners from two public institutions in the Piedmont-Triad region of North Carolina. The Leadership Motivation Index Questionnaire (LMIQ) is an 11 question assessment designed to explain potential correlations between the frequency of motivational factors and preferred leadership styles. The LMIQ includes three sections (demographics, motivation, and leadership style) to access what may motivate homeowners to adopt renewable energy, residential applications. Based on the findings of this study, sample Piedmont-Triad homeowners prefer a supportive leadership behavior, and are most influenced to integrate renewable energy applications within their home by the motivational construct of valence. A medium significance was found in the correlation between valence (motivational construct) and supportive (leader behavior), expectancy (motivational construct) and directive (leader behavior), and instrumentality (motivational construct) and supportive (leader behavior).

CHAPTER 1

Introduction

Statement of the Problem

According to a Truman National Security Project report in 2010, America spends around $1 billion to import oil—per day. This fact elaborated, the Energy Information Administration (EIA) reports that America imports over 66% of its oil; more than double the amount of imported oil in 1970, which was a mere 28% (Powers, 2010). Consider that statistic along with EIA's forecast of oil consumption increasing by 44% in America between 2000 and 2025—not to mention a 57% increase worldwide—fossil fuel resources may soon become a costly commodity. Some reports, dating back to the early 2000s, such as The Colorado River Commission of Nevada, posit that several studies suggest oil reserves will begin to empty between 2050 and 2075 (The Colorado River Commission of Nevada [CRC], 2002). This sets a stage of urgency for leadership to find a set of solutions for energy consumption that has become ever more problematic.

Despite decades of strategies and techniques to lower America's overdependence on fossil fuel as a primary energy source, leadership has yet to significantly exhibit an alignment of leader behavior that motivates energy consumers to adopt renewable energy applications. To close this gap, this study concurrently examined individuals' motivational forethought and preference of leadership style.

An individual's decision making process involves an element of choice, and when the direction of that choice is either implicitly or explicitly altered by another individual, this is not only a simple representation of leadership, but also an example of the power of motivation (Scarnati, 1999). The concept of motivation or the technique of influencing an individual to

choose a certain belief or behavior may be a pivotal component to improving the trajectory of renewable energy use in America (Wustenhagen, Wolsink, & Burer, 2007).

Consider the occurrence of the 2008 economic downturn, a point in time where America's leadership, as well as its citizens, began to see a number of areas that were in need of reform. Whether it was the financial sector, the educational sector, or domestic governance and foreign diplomacy sector, this particular crisis engaged leadership and citizens to re-evaluate the culture of the American lifestyle. Part of that lifestyle which increasingly came under review was the use and source of power (Sachs, 2009). Leaders throughout America whom were tasked to examine the state of fossil fuel usage found plausible data suggesting that America's dependence on fossil fuel was systemically damaging to American prosperity (Bang, 2010). Statistics such as the U.S. Department of Defense as the largest, single oil consuming agency in the world, or reports indicating that America consumes more barrels of oil per day than China, Japan, Russia, Brazil, or Germany, combined—spending in excess of $113 billion per year on foreign oil alone (or about half the size of the entire Chilean economy)—garner America's best thinkers to revisit an alternative source of power (Karbuz, 2007; Shafiee, & Topal, 2009). As part of the recovery from, and prevention of another 2008 economic crisis, the concept of alternative energy has now been reintroduced as a viable option for leadership. However, that possibility has a familiar past and present.

Leadership's mention of alternative energy applications as a viable solution to reduce American expenditures is not a new concept. Applications such as wind, solar, geothermal, hydro, biomass, and tidal have been around since the late 1970s, and were considered a tool for economic stability and national security by then President Jimmy Carter (Miller, 1995). Faced with similar economic constraints during that period of crisis, U.S. leaders were also tasked to

integrate alternative energy concepts into the American lifestyle; if not for economic and security reasons, at least as a strategy to preserve the environment (Colby, 1991). Since that time, there have been a number of presidential administrations, scientists, environmentalists, etc., who have continued the challenging quest to lessen fossil fuel use by integrating alternative sources of energy (Sorensena, 1991). However, their efforts have produced miniscule results, especially in relative comparison to other nations of the world (Lloyd & Subbaroa, 2009). From the time President Jimmy Carter asked the nation in 1977 to reduce their energy footprint, to now, where President Barack Obama professes a renewed initiative toward alternative energy use in America, data has shown an almost anemic increase in alternative energy production and a blistering growth in fossil fuel consumption (Byrnea, Hughes, Rickerson, & Kurdgelashvilla, 2007). In order to develop a formative solution to this problem, this study sought to explain a possible implementation error, wherein America's current leadership techniques and strategies may not effectively stimulate an individual's motivation to adopt renewable energy applications.

For decades theorists have considered motivation a key component of effective leadership, and with its fulfillment, or lack thereof, motivation arguably influences the outcome of many initiatives across the globe (Riggio & Reichard, 2008). Theoretical perspectives offer explanation to several conceptual variations of motivation, along with measurable evidence illustrating such concepts. Many theorists question how individuals process decision making, or search for reasons to explain why individuals choose a particular behavior to reach an end they value. In his 1954 book, *Motivation and Personality,* Abraham Maslow expressed that individuals are motivated by five basic needs: self-actualization, esteem, belongingness and love, safety, and biological or physiological needs. These hierarchy of needs exemplify the rudimentary factors that are considered when individuals determine their choices—much like

whether or not to follow American leadership's advocacy for renewable energy adoption. Additional theories, although in the context of a work environment, explain how a particular job or objective may consist of characteristics that satisfy an individual's need for achievement, competency, status, personal worth and self-realization, thus also influencing their behavior (Gratton, 1974).

After careful review of peer reviewed journals, books, online periodicals and presentations, with a search criterion inside of 1974 to 2010, a limited repository was found to discuss the condition of motivation, and its relationship to leadership styles within renewable energy initiatives. The single, most relevant literature examined how the correlation of motivation and leadership style may affect medical personnel's performance within Walter Reed Army Medical Center and National Naval Medical Center, located near Washington, D.C. (Brooks, 2009).

In an effort to add to the body of literature which discusses the correlation and impact of motivation and leadership style, the researcher evaluated studies related inclusively to Victor Vroom's expectancy of motivation theory and Robert House's path-goal leadership styles. By contextually applying their theoretical tenets of motivation and leadership style, the results of the study may provide significant insight for renewable energy integration initiatives.

In 1964, Vroom introduced constructs Expectancy, Instrumentality, and Valence to explain how individuals make decisions to achieve the end they value—known as the Expectancy of Motivation Theory. He explained expectancy as the belief of capability that one may possess to accomplish a set goal; instrumentality as one's belief that if they complete certain actions, the outcome will be achieved; and valence as the value one may perceive of the said outcome (Vroom, 1964).

In addition to Vroom's work, House (1971) explained that leadership can either follow one or a combination of leadership styles to reach a set objective. He prescribed styles that were considered directive, achievement-oriented, participatory, or supportive—known as the Path-Goal Theory of Leadership. After extensively searching the last 30 years of published literature based on leadership, the researcher was unable to locate relative discussions of House's path-goal theory separate of business settings, thereby limiting its scope and utility in alternative contexts. Additionally, an identical scope realized the same results within a literature search for whether correlations may exist between Victor Vroom's motivational constructs and Robert House's leadership styles.

This study will reveal how these foundational theories (Vroom or House) might apply to leadership and renewable energy use, thus expanding a theoretical basis for both scholars and practitioners. Furthermore, by deconstructing the conceptual frameworks of motivation and leadership style, via Victor Vroom and Robert House, respectively, the renewable energy leader approach may become more pragmatic.

Theoretical Orientation

In most management textbooks, leadership and decision making are treated as different processes. Topics such as teams, influence, and motivation are connected with leadership, and topics such as risk, uncertainty, information processing and learning are connected with decision making (Goethals, Sorenson, & Burns, 2004). The two processes merge when a leader offers team members the opportunity to influence the group's decision (Goethals et al., 2004). In 1935, theorist, Kurt Lewin, studied this democratic leadership philosophy, conducting research that developed the constructs of force and valence to describe the factors that influence the decision making process (Lewin, 1935).

Prior to Lewin's research, another preeminent behavioral psychologist, Edward Tolman, contributed many experimental articles about using behavioral methods to understand the mental process of humans. From his work, Tolman developed what he referred to as purposive behaviorism; others have called it an expectancy theory. His theory was interested in the properties of an act of behavior, and not the neural processes that control the act. Moreover, Tolman posited that behavior is regulated in accordance with objectively determinable ends (Tolman, 1932).

Both Lewin and Tolman developed similar theories on the basis of motivation. Tolman, one of the first behaviorists, and famous for his work on the role of expectancy in cognitive decision making, provided influential research for Lewin's quasi-mathematical models based on constructs of force and valence. Although Lewin and Tolman conducted much of the early work on expectancy theory, their research was extended by Victor Vroom in 1964. Vroom's expectancy of motivation theory eventually applied much of Lewin and Tolman's models to the workplace environment (Levy, 2009; Miner, 2009). Victor Vroom asserted that if people expect an optimistic and desirable outcome, they will usually work hard to achieve such an objective at the level expected of them (Expectancy Theory, 2008). If this relationship between expectation and outcome is trusted, then motivating an individual should compute three things: (a) Expectancy—the belief of capability that one may possess to accomplish a set goal; (b) Instrumentality—one's belief that if they complete certain actions, the outcome will be achieved; and (c) Valence—the value one may perceive of the said outcome.

Influenced by Vroom's expectancy of motivation theory, this study also incorporated Robert House's Path-Goal Theory of Leadership. House read a paper by Martin G. Evans in 1970 where the relationship between the Ohio State measures of leader consideration and leader

initiating structure and follower perceptions of path-goal relationships were assessed (House, 1996). After reading Evan's paper, House thought that the relationship between structure and subordinate satisfaction and motivation is contingent upon the degree to which subordinates needed clarification of the behaviors required of them in order to perform effectively. Once House began to think in terms of contingencies and the effect of leaders on subordinate motivation, a number of hypotheses came to mind, and he subsequently wrote of path-goal leadership in 1971 (House, 1996). In the initial version of the theory, it stated that

> the motivational function of the leader consists of increasing personal payoffs to subordinates for work-goal attainment and making the path to these payoffs easier to travel by clarifying it, reducing roadblocks and pitfalls, and increasing the opportunities for personal satisfaction en route. (House, 1971, p. 324)

To contextually apply both theories (Vroom and House) relative to a real world scenario, the researcher posits that one of Vroom's motivational constructs may appear as motivation for homeowners to adopt renewable energy, residential solar applications. Likewise, those homeowner motivations may also correlate with a set of leadership behaviors. Based on Victor Vroom's expectancy of motivation theory, homeowners might indicate whether they were motivated by a specific expectancy theory construct. Based on Robert House's path-goal theory, homeowners might also indicate a preferred leadership behavior. A relationship between both theories, as well as a more accurate strategic approach to renewable energy inclusion may become apparent.

This research aimed to illustrate the aforementioned by distinguishing which of the homeowner motivational constructs are potentially more dependent upon a set of leadership behaviors.

Purpose of the Study

The purpose of this quantitative, explanatory correlational study was to explain the relationship between homeowners' preferred leadership style and their motivation to use sustainable energy. Preferred leadership style was the independent variable as measured by the Path-Goal Styles Questionnaire that has four components: achievement, directive, participative, and supportive (House, 1971). Motivation was the dependent variable as measured by an instrument based on Expectancy Motivation Theory that has three constructs: expectancy, instrumentality, and valence (Vroom, 1964).

Research Questions

The following research questions guided the study:

1. Which of Victor Vroom's expectancy motivation constructs do residential homeowners rate as most influential?
2. Which of Robert House's path-goal leadership styles do residential homeowners most prefer?
3. How does preferred path goal leadership style affect homeowner's motivation to use sustainable energy?
    a. What is the relationship between directive leader style and expectancy motivation construct, instrumentality motivation construct, and/or valence motivation construct?
    b. What is the relationship between participative leader style and expectancy motivation construct, instrumentality motivation construct, and/or valence motivation construct?
    c. What is the relationship between supportive leader style and expectancy motivation construct, instrumentality motivation construct, and/or valence motivation construct?
4. What are implications for sociopolitical context of renewable energy?

Definition of Terms

The following terms are used throughout the study:

1. *Valence* is the value of the perceived outcome (i.e., what's in it for me?) (Vroom, 1964).
2. *Instrumentality* is the belief that if I complete certain actions then I will achieve the outcome. (i.e., clear path?) (Vroom, 1964).
3. *Expectancy* is the belief that I am able to complete the actions. (i.e., my capability?) (Vroom, 1964).
4. *Directive path-goal clarifying leader style* refers to situations where the leader lets followers know what is expected of them and tells them how to perform their tasks (House, 1971).
5. *Achievement-oriented leader style* refers to situations where the leader sets challenging goals for followers, expects them to perform at their highest level, and shows confidence in their ability to meet this expectation (House, 1971).
6. *Participative leader style* involves leaders consulting with followers and asking for their suggestions before making a decision. This behavior is predominant when subordinates are highly personally involved in their work (House, 1971).
7. *Supportive leader style* is directed towards the satisfaction of subordinates needs and preferences. The leader shows concern for the followers' psychological well-being. This behavior is especially needed in situations in which tasks or relationships are psychologically or physically distressing (House, 1971).

Delimitations and Limitations of the Study

As the study design evolved, there were a number of theoretical directions that were relevant and worth an analysis. However, the researcher viewed these areas of potential interests

as less insightful to the primary purpose of explaining the role of motivation and leadership style in renewable energy integration. The following two sections, Delimitations and Limitations, share some those considerations and their reason for being excluded from the research.

Delimitations. The researcher will generate specific inferential relationships between homeowner motivation and preferred leadership style from residential homeowners at two public universities in the southeastern United States. There were a number of research questions that were not pursued, such as, "how does homeowner motivation toward adopting residential renewable energy applications compare with their motivation toward adopting alternative energy practices outside of the home (e.g., carpooling, buying a more fuel efficient car, etc.)?," or "how is homeowner motivation toward adopting residential renewable energy applications affected by state and federal economic incentives?." These questions were not pursued in the study because (a) the primary research intent was to explain a relationship between individual motivations and preferred leadership styles; (b) the focus of the research is to examine individuals' motivations from a behavioral and residential context, not on their external behaviors or economic preferences; and (c) to include these questions would extend the depth of research beyond a limited time frame and funding.

Likewise, a possible delimitation of the present study is the scope of utilized literature and theoretical orientation. Although, Victor Vroom and Robert House were among many motivational and leadership style theorists, the present study chose not to use relative counterparts such as Martin Fishbein and Icek Ajzen, Theory of Reasoned Action, or James MacGregor Burns, Transformational Leadership. They were excluded from the study due to Fishbein and Ajzen's focus on attitudinal and behavioral intention, opposed to Vroom's motivational process which explains how individuals make decisions to achieve the end they

value (Fishbein & Ajzen, 1975; Vroom, 1964). Burns' transformational leadership style was excluded due to its focus on leaders and followers helping each other to increase levels of motivation, whereas House's path-goal style is more a transactional leadership style and focuses singularly on how leadership can help the follower (Hater & Bass, 1988; House, 1971).

Limitations. The study's sample consisted of faculty and staff employees at two public universities in the southeastern United States. Due to convenience sampling used for data collection, the findings are not considered generalizable to groups or populations outside of the study sample. Additionally, the limitation for the modified survey instrument used for data collection is duly considered. Therefore the content validity of the questionnaire was established by a panel of experts (e.g., public HBCU/PWI Cooperative Extension Program Staff) and a pre-sample group of homeowners; reliability was established by conducting the appropriate statistical test on data collected through the questionnaire.

Significance of the Study

After extensive review of the literature, a large number of studies mostly centered on motivation and leadership style discussions within a business milieu (House, 1996; Vroom, 1964). This research will potentially expand the literature, along with expanding the knowledge base relative to renewable energy leadership by explaining the relationship between a certain leadership style and individual motivation. Furthermore, this study may provide a set of strategic frameworks for a myriad of stakeholders.

The researcher aimed to apply two theoretical platforms in order to guide the leadership decision making process toward more effective renewable energy integration approaches in America; therefore improving the progress to curb America's over dependence on fossil fuel as a primary energy source. This study describes potential relationships between homeowners' motivation to

adopt renewable energy applications, and their preference for a particular renewable energy leadership style—all of which are analyzed through the tenets of Path-Goal Theory (House, 1971), and the Expectancy Theory of Motivation (Vroom, 1964). By extracting what an individual values in their process to choose renewable energy adoption, utility leaders will now have indicators to help guide or accurately aim implementation strategies. Secondly, by identifying motivation constructs with a correlative leadership style, utility leaders, as well as leadership scholars, are provided an instrument for use in alternative areas of research. Lastly, individuals, specifically, study participants, are provided a vehicle to identify what they value most in the process of choosing new ideas or preferred leadership styles. Furthermore, by explaining potential relationships between participant's motivation relative to renewable energy and their preferred leadership styles, the body of knowledge in leadership studies can be expanded.

Organization of the Dissertation

The dissertation is comprised of five chapters. Chapter 1 introduces the research by discussing the topic of study, the theoretical framework, the design components, and the significance of the study. Chapter 2 presents a review of literature relevant to the study by discussing the foundational theories that undergird motivation, leadership style, and renewable energy integration within the home. Chapter 3 explains the methodology design chosen to collect and analyze the data. Chapter 4 presents results of the data analysis procedures. Chapter 5 summarizes the study's findings, implications, and recommendations for future research.

CHAPTER 2

Review of the Literature

The purpose of this quantitative, correlational study was to explain the relationship between homeowners' preferred leadership style and their motivation to use sustainable energy. Because of this particular type of research—which focused on the concepts of motivation, leadership, and the impact of renewable energy applications for homeowners—a foundation of fundamental understanding should be established.

The two principal theories undergirding the study are supplied by Victor Vroom's 1964 expectancy of motivation theory, and Robert House's 1971 path-goal theory of leadership. As previously explained throughout the introduction of this proposal, both Vroom and House describe the impact of individual motivation and the styles of leadership which stimulate that motivation. However, the core of their theories were prompted by, and subsequently deliberated through many years of study much before and after the theorists' published explanation, and therefore should be reviewed.

This seeks to discuss some of the perennial literature that provided a developmental basis for Vroom and House, as well as several studies that have qualitatively and empirically analyzed the concepts of motivation and leadership. As a result, the final portion of the literature review (studies relative to renewable energy adoption by energy consumers and homeowners) may offer a more clear relation between motivation and leadership, and their implications for renewable energy integration amongst the convenience sampling of public, southeastern university homeowners.

In order to unpack the theoretical tenets within this review of the literature, the content will first discuss the general concept of leadership, and how it evolved from a discussion of

leader traits to more about leader styles or behaviors. Secondly, the content will communicate the concept of motivation; its explanation, relative theories (e.g., field theory, hierarchy of needs, and motivation hygiene) and empirical studies. The third portion of the literature review will cover the concept of leadership behavior; its explanation, relative theories (e.g., situational & contingency theory, functional theory, and transactional & transformational theories) and empirical studies. And lastly, the remaining content will discuss renewable energy applications; its explanation, and several relative studies focused on the implications for consumer integration (e.g., social acceptance, promotion, and public opinion).

Concept of Leadership

The initial conversation about leadership arguably begins by simply defining its role, impact, and objective. However, this is an arbitrary task to say the least. To date, and for many decades prior, scholars and practitioners have theorized and applied multitudes of interpretations of what leadership is and should be. Are good leaders born with the traits and skill sets required for effectiveness, or are leaders trained and nurtured for greatness? Some of the world's leading scholars in the field have offered varying explanations to such questions. Peter Drucker (1988) posits that "the only definition of a leader is someone who has followers" (p. 14). John C. Maxwell (1998) says that "leadership is influence—nothing more, nothing less" (p. 20). Warren Bennis (2003) contests that "leadership is a function of knowing yourself, having a vision that is well communicated, building trust among colleagues, and taking effective action to realize your own leadership potential" (p. 78). The Roman Catholic Diocese of Rochester defines leadership as "the process of influencing the behavior of other people toward group goals in a way that fully respects their freedom."

As seen, the task of defining leadership is much about interpretation and application. In the book, "Introduction to Leadership: Concepts and Practice," Peter Northouse (2009) professed that more than 100 different definitions have been identified; which was according to a source dating back to 1991.

Trait approach. Determining a core explanation of the concept of leadership has commonly been an ambiguous process, and literature reveals that academia has attempted alternative approaches to accomplish such a task. However, in contrast to the lone approach of identifying a definitive explanation of leadership, early studies chose to analyze the actual components of good leaders. For example, the trait approach was one of the first categorizations used to describe the composition of a good leader. The trait perspective relates to the phrase, "He or she is a born leader," and conceptualizes that leaders possess individual attributes in varying degrees, existing solely from innate, inborn, abilities (Jago, 1982). In the early twentieth century, leadership traits were theorized as the characteristics held by great social, political and military leaders, which ultimately determined the traits that clearly separated leaders from followers (Northouse, 2007).

There are a number of researchers who have compiled lists of personality traits or characteristics relating to leadership. Table 1 provides a timeline of trait theorists and their findings. In 1948, Ralph Melvin Stogdill conducted a series of qualitative reviews of 124 studies that a number of characteristics that distinguished leaders from non-leaders, and argued that leadership was determined by the situational factor. In other words, an individual who was a leader in one situation may not have been a leader in another situation (Stogdill, 1948). Stogdill concluded that certain traits must be relevant to the situation. He found that intelligence, alertness, insight, responsibility, initiative, persistence, self-confidence, and sociability were the

situational traits that differentiated a leader from other individuals throughout 124 studies conducted between 1904 and 1948. Stogdill later returned with a second series of qualitative reviews of 163 studies conducted between 1948 and 1970. His analysis focused more on situational factors and not on personal traits, and found that leaders within these studies exhibited traits of: achievement, persistence, insight, initiative, self-confidence, responsibility, cooperativeness, tolerance, influence, and sociability (Northouse, 2004).

Table 1

Timeline of Trait Theorists and their Findings

Theorist	Research & Analysis	Trait Findings
Stogdill	1948	Intelligence, Alertness, Insight, Responsibility, Imitative, Persistence, Self Confidence, Sociability
Mann, R.D.	1959	Intelligence, Masculinity, Dominance, Adjustment, Extroversion, Conservatism
Stogdill	1974	Achievement, Persistence, Insight, Initiative, Self-confidence, Responsibility, Cooperativeness, Tolerance, Influence, Sociability
Lord, DeVader, & Alliger	1986	Intelligence, Masculinity, Dominance
Kirkpatrick & Locke	1991	Drive, Motivation, Integrity, Confidence, Cognitive ability, Task knowledge
Kouzes & Posner	1993	Honest, Forward Looking, Competent, Inspiring, Intelligent, Fair Minded, Broad-minded, Supportive, Straightforward, dependable

In 1959, Richard D. Mann analyzed more than 1400 study findings based on personality and performance in small groups, and found leaders to show traits of: intelligence, masculinity, dominance, adjustment, extroversion, and conservatism. Mann was followed by another group of researchers in 1986—Lord, DeVader, and Allinger—who conducted a meta-analysis to determine that people perceive leaders as intelligent, masculine, and dominating. Another

significant research study in 1991, by Locke and Kirpatrick, argued that leaders are unlike other people by possessing six traits: drive, desire to lead, honesty, integrity, self-confidence, cognitive ability, and knowledge of the business (Northouse, 2004).

Style approach. In contrast to examining leadership traits, a number of models and theories were subsequently developed to consider what leaders actually do as opposed to their inherent characteristics. This particular perspective, known as the style approach, focuses on the behavior of the leader, and how they act (Northouse, 2007).

Some of the first studies centering on this idea were conducted at Ohio State University in 1948. The findings indicated that the two most important aspects of leadership included (a) initiating structure, and (b) consideration. These two constructs were independent of each other and were based upon a questionnaire to subordinates and leaders. The questionnaire, commonly known as the Leader Behavior Description Questionnaire (LBDQ), was developed by generating a list of 1790 statements and then narrowing them down to 150 statements designed to measure nine different dimensions of leadership behavior (Halpin, 1957).

Taking place around the same time as the Ohio State Studies, the University of Michigan conducted a series of leadership studies, starting in the 1950s. The Michigan studies concentrated on identifying the primary styles of leadership that led to increased productivity and enhanced job satisfaction, and found three primary behaviors: (a) task-oriented behavior: effective managers tasks were unlike subordinates, relating more to scheduling work, coordinating activities and providing resources; (b) relationship-oriented behavior: effective managers were helpful of subordinates, such as with career aspirations, job-well done acknowledgements, and work or personal problems; and (c) participative leadership: effective leaders include the ideas of

subordinates, creating an environment receptive to group decision making and problem-solving (Likert, 1961).

Motivation

Whether defining effective leaders by their inherent traits, or by an exhibited leadership approach, a common effort may exist within each: how to best establish or stimulate the driving force by which another individual achieves a goal. This commonality refers to the concept of motivation. Leaders with an interest in a positive leadership outcome (as a result of either their traits or approach) may also consider a basic understanding of human motivation. As a benefit, leaders not only become more knowledgeable about some of the components of motivation, but also which leader traits or styles make the most sense to accomplish such intentions (Katzell & Thompson, 1990).

Motivation is much more complex than simply influencing an individual to follow a set of actions or to change an individual's way of thinking. Social and behavioral scientists have toiled over why people behave the way they do for hundreds of years (Katzell & Thompson, 1990). Some of the issues which have divided many motivational scholars include: is motivation simply internal to the individual or based more on external forces? Can motivation be explained as a process whereby an individual makes a choice among alternatives, or is motivation a process based purely on emotion and passion? (Scholl, 2002)

Dr. Richard W. Scholl of the University of Rhode Island, Charles T. Schmidt, Jr. Labor Research Center, defines motivation as the force that energizes, directs, and sustains behavior. He describes "energies behavior" as the amount of effort or energy an individual puts into a task; "directs behavior" as dealing with the question of choice and conflict among alternative

behaviors; and “sustains behavior” as why individuals continue working toward something long after others have quit (Scholl, 2002).

Scholl is one of many who have aimed to capture sources of motivation, and amongst several theorists who have discussed motivational effect. In 1978, Katz and Kahn argued that organizational member’s motivation can be sectioned in terms of legal compliance, external rewards, and internalized motivation, or self-expression. This is, for example, when organizational goals become incorporated into the value system of the individual (Katz & Kahn, 1978). Theorist Etzioni suggested in 1975 that individuals’ motivation is influenced by social exchange processes by members of an organization through alienation, calculative, or moral means. This alludes to motivational factors such as internalization of norms, and pressures from peers of the organization to sacrifice personal pleasures to accomplish team goals (Etzioni, 1975).

External factors are very relevant to the explanation of motivation (Lewin, 1939). In the 1940s and 1950s, Kurt Lewin, viewed as the father of psychology, developed the field theory. Lewin’s field theory examined the pattern of interaction between the individual and environment (Sundberg, 2001). Moreover, he looked to the power of underlying forces such as individual needs to determine behavior, but particularly how the tension between those perceptions of self and of the environment were processed (Lewin, 1939).

Hierarchy of needs. Perhaps as Maslow would describe in his 1954 book, Motivation and Personality, an individual’s motivation is simply based upon a set of intrinsic needs. In his theory, Maslow suggests that the most basic of needs, such as esteem, friendship and love, security, and physical are fundamental driving forces for an individual. And beyond these needs, higher levels exist, such as understanding, esthetic appreciation and spiritual needs. Maslow

asserts that the individual's higher level needs can only be met after the initial hierarchy of basic needs are satisfied. Once this sequence has occurred, an individual is then willing and able to fully focus their motivation (Maslow, 1954). Figure 1 provides an interpretation of Maslow's hierarchy of needs.

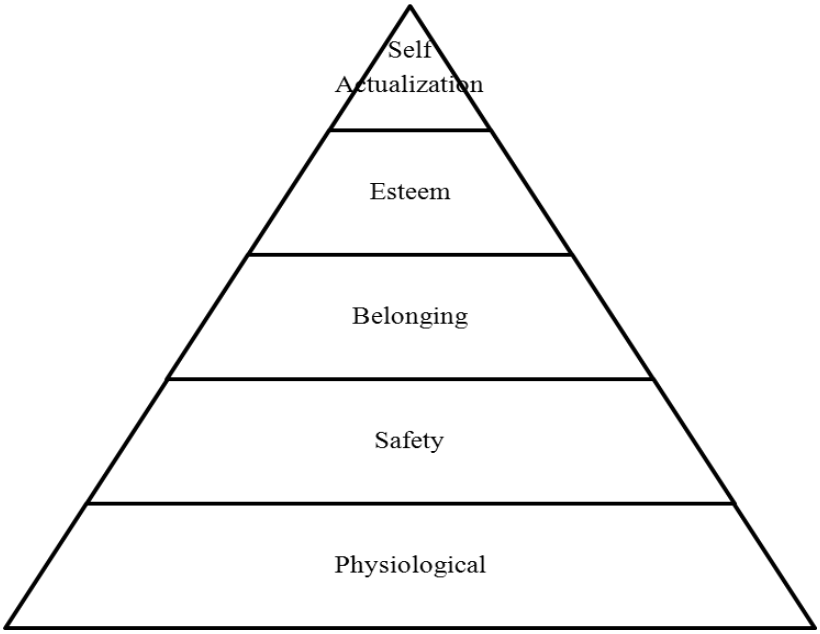

Figure 1. Abraham Maslow's Hierarchy of Basic Needs. A depiction of Maslow's hierarchy of needs, illustrated with the more basic psychological needs at the bottom (Maslow, 1954).

Motivator hygiene. In 1959, an American psychologist, Fredrick Herzberg, further explored much of Maslow's hierarchy of needs theory, and subsequently a motivation-hygiene theory, also known as the two factor theory. Based on his interviews of 203 American accounts and engineers in Pittsburg, Pennsylvania, Herzberg found similar conclusions as Maslow; except that the Pittsburgh interviews showed that individuals are not content with the sole satisfaction of lower level needs at work (e.g. minimum salary levels or decent working conditions), but rather looked for higher level needs, such as achievement, recognition, responsibility, advancement, and the essence of the work itself (Herzberg, Mausner, & Snyderman, 1959).

According to Herzberg, the hierarchy of basic need satisfactions suggested by Maslow worked differently within his Pittsburgh findings; Herzberg argued that worker satisfaction and dissatisfaction are not on a continuum, but are independent. In other words, Herzberg's motivation-hygiene (two-factor) theory states that one set of factors or needs lead to worker satisfaction, while another set of needs lead to work dissatisfaction. Moreover, an increase in work satisfaction does not assume a decrease in work dissatisfaction. Based upon Herzberg's interviews, in order to increase satisfaction, management should focus more on aspects related to what an individual does, such needs as achievement, status, personal wealth, etc. Conversely, if management wanted to reduce dissatisfaction, they must focus on aspects related to the environment such as policies, working conditions, procedures, etc. (Herzberg et al., 1959).

Herzberg's motivator-hygiene (two-factor) theory states two sets of factors: (a) Motivator Factors that provide positive satisfaction (e.g., recognition, personal growth, promotion, work itself, achievement); and (b) Hygiene Factors that stimulate dissatisfaction with their absence (e.g., pay and benefits, supervision, status, job security, etc.). Table 2 compares and contrasts motivation and hygiene factors.

Ultimately, Herzberg reasoned that the opposite of satisfaction is not dissatisfaction, but rather no satisfaction; likewise, the opposite of dissatisfaction is not satisfaction, but rather no dissatisfaction. A study in 2009 by Mohamed Hossam El-Din Khalifa and Quang Truong supported Herzberg's theory by finding that perception of equity and job satisfaction were not related when their equity comparison indicated a Herzberg hygiene factor (El-Din Khalifa & Truong, 2010).

Table 2

Differentiating Motivation Factors and Hygiene Factors

Motivation Factors	Hygiene Factors
Achievement	Pay and Benefits
Recognition	Company Policy and Administration
Work Itself	Relationships with co-workers
Responsibility	Supervision
Promotion	Status
Growth	Job Security
	Working Conditions
	Personal life

The motivational theories have described how to best establish or stimulate the driving force by which another individual achieves a goal, and they contain a myriad of factors. Many of the perennial and recent theorists have tested such factors in varying contexts such as business and academia alike. However, the research views the concept of motivation as only one of the two components in the process toward renewable integration in America. Just as there are fundamental factors involved in motivating homeowners to adopt renewable energy applications, there are also fundamental factors involved in a leader's approach to stimulate such motivation—thusly, the second component of the literature review: leadership behavior.

Leadership Behaviors

A leadership approach or, rather, behavior is very diverse in nature. Historically, leaders of all contexts have created, borrowed from one another, or customized leadership behaviors in which they have determined effective. At its core, a leader's behavior is the result of their

philosophy, personality and experience. But regardless of these characteristics, what may unite leaders such as Franklin Roosevelt, Nelson Mandela, Vince Lambordi, or even civic leaders is their intent to motivate their followers. However, they are distinguished by the environment and conditions that invoke their respective leadership behavior.

Considering the context of a particular situation is an important factor to leadership behavior, and quite possibly, a precursor to any leadership strategy or technique. The context of a situation may be contingent upon the actual group or individual being led, or the task, job or function that needs to be accomplished (Hersey & Blanchard, 1977). In the early 1960s, several contingency theories were developed around this framework.

One of the early applications came from the research of Thomas Burns and G.M. Stalker. They found that effective managerial techniques within textile mills, for example, were highly dependent on the type of task the organization was attempting to accomplish. A number of theorists have discovered a relevance and attractiveness of the contingency theory, which many feel are due to its situational perspective (Hahn, 2007). As well-known Stanford University sociologist Richard Scott asserts, "The best way to organize depends on the nature of the environment to which the organization must relate" (Scott, 1981, p. 114). Along with Scott, other theorists, namely Paul Lawrence, Jay Lorsch, and John Child have acknowledged contingencies such as environmental conditions and ownership patterns as important in deciphering a leadership behavior to use in a given situation (Hahn, 2007).

Hersey-Blanchard Situational Leadership Theory. One of the preeminent theories about contingency leadership was conceived by Paul Hersey and Ken Blanchard in 1968, the life cycle theory of leadership, later renamed situational leadership theory. Their theory reasons that there is no single best way of leadership, and that effective leaders adapt their style of leadership

to the individual or group's maturity level. In essence, based on the knowhow, initiative, and focus of the group or individual, the leader will determine what level of involvement is necessary to accomplish the set task. Hersey and Paul narrow to four different leadership styles based on that notion. The first style, "telling," is where the leader provides the what, how, when and where to do the task. The second style, "selling," is where the leader uses two-way communications via social or emotional support, allowing for the individual or group to buy into the task process. The third style, "participating," is where the leader provides more detail about how the task is completed by sharing decision making, and concentrating more to develop a deeper working relationship with the individual or group. And the forth style, "delegating," is where the leaders continues to be involved in decisions, but assumes more of a monitor role to the process, thus giving more responsibility to the individual or group (Hersey & Blanchard, 1969).

Fiedler Contingency Model. Another well-known theory, which considers both contingency and situational factors, is Fiedler's 1967 contingency model. Fred Fiedler defined two types of leaders: those who desire to establish and maintain good relationships with the group during the process of task completion, and those who are only concerned with completing the task, and are indifferent to relationship building with the group. According to Fiedler, there is no ideal leader, however, each of the two types of leader style (relationship versus task) are best fitted within either a favorable or unfavorable situation. For example, machinery operators may prefer a more structured process for task completion, and care less about relationship oriented leadership. Thus, the machinery worker environment is unfavorable to relationship oriented leadership. In regard to the task-oriented leadership style, for example, scientists or artists may desire the freedom to follow their own creativity process to reach a goal set by the leader, which would contradict the no nonsense style of a structured, task oriented leader (Fiedler, 1967).

The power of motivation is essential to effective leadership, and to contemplate the influence of a unique situation, individual, or group—situational contingencies—are just as vital for successful leadership behavior. Yet a leader must also think about the actual interaction between leaders and followers that exist within the aforementioned situational contingencies. As leadership theories evolved on the basis of leader traits, and subsequently, leader behaviors, the way in which either was applied began to be grouped as either transformational or transactional (Fiedler, 1967).

Transactional and transformational theories. In 1978, James MacGregor Burns first introduced the concept of transformational leadership. According to Burns, transforming leadership is where "leaders and followers help each other to advance to a higher level of morale and motivation" (1978, p. 20). The transforming leader redesigns an individual's values and perceptions, goals and expected outcomes. Conversely, Burns theorized transactional leaders as an alternative to transforming leadership. Unlike the transforming style of leadership, where the leader-follower relationship is based upon the leader's personality, traits and ability to motivate toward an inspiring vision, a transactional leader believes that followers are motivated by reward or punishment. The transactional leader, the most common type of leader, gives clear instructions, and focuses more on a series of transactions in route to a set goal (Burns, 1978).

In 1978, another theorist, Bernard M. Bass, extended the work of Burns by explaining the psychological mechanisms that undergird transforming and transactional leadership. Bass also used the now more commonly referred "transformational" instead of "transforming" leadership. Bass points out that the best leaders use both styles of leadership. When a leader attempts to appeal to the values of the follower as motivation, and is unsuccessful, the leader may then resort to a transactional skill set as an effective negotiator, using rewards, for example, as a motivator

(Waldman, Bass, & Yammarino, 1990). Table 3 provides a comparison between transactional and transformational leadership.

Table 3

A Comparison of Transactional and Transformational Leadership

Transactional Leadership	Transformation Leadership
Leaders are aware of the relationship between effort and reward	Leaders provoke emotions in their followers which motivate them to act and go beyond normal dialogical exchange.
Leadership is responsive and deals with present issues	Leadership is preemptive and establishes new expectations in followers
Leaders rely on standard forms of incentive, reward, and punishment as control mechanisms	Leaders are differentiated by their capacity to inspire and provide special considerations, to their followers
Leaders motivate followers by setting goals and promising acknowledgment for desired performance	Leaders create learning prospects that excite followers to solve issues
Leadership depends on the leader's power to strengthen subordinates for their successful achievement	Leaders possess good vision and management skills, which also develop strong emotional ties with followers
	Leaders motivate followers to strive for goals that go beyond egotism

Note: Adapted from *The Impact of Transformational leadership on subordinate job satisfaction*, by Vanisha Balgobind, 2002. University of South Africa.

Conceptualizing for Renewable Energy Integration

Collectively, a better understanding of where the constructs of motivation and leadership behavior intersect may shed light on how to address the premise of the research questions presented within the research study:

1. Which motivational constructs do residential homeowners rate as most influential in their willingness to adopt renewable energy applications?
2. Which styles of leadership behavior do residential homeowners most prefer?

3. What is the relationship between residential homeowners' motivational constructs and their selected leadership style preferences?
4. What are implications for sociopolitical context of renewable energy?

The research study uses these questions in an effort to add elements of solution to America's over dependence on fossil fuel. The theoretical lens of the proposal suggests that a portion of America's energy problem rests in the lack of interest by energy consumers to utilize alternative and renewable energy sources, such as wind, geothermal, biomass, and solar. As previously covered throughout the literature review section, there are several psychological, strategic, and behavioral aspects for leadership to consider when attempting to motivate a population to change their conventional use of energy (fossil fuel) within their residence, which has been indoctrinated for generations, and is now second nature.

The research attacks this long-standing, thirty-year challenge of leadership by taking another look at some of the basics. With this approach, the research revisited the structural value of an individual's motivation for renewable energy, and more importantly, considered the fact that leadership itself may need to re-analyze the behavioral styles used to stimulate energy consumers' reception of renewable energy applications. Moreover, by accessing the rudimentary principles of individual motivation and leadership behavior, leaders who believe America's path toward energy independence is highly contingent upon the united effort of its citizens, may now possess a more comprehensive tool set for improving social acceptance, promotion, and public opinion about renewable energy integration in America.

Social acceptance. Energy leaders around the world share a commonality with respect to integrating renewable energy applications. This common bond is the challenge of gaining the acceptance of an energy consumer to use unconventional sources of energy, such as renewables.

Largely neglected in the early eighties, studies which focused on social acceptance of alternative energy measured public perceptions by administering surveys, with results indicating significant support. However, it was later determined that a more accurate measure of social acceptance was needed, one which better defined social acceptance of renewable energy use (Wustenhagen et al., 2007).

The first scholar to theorize a way of accurately measuring social acceptance did so by first defining social acceptance for wind power. Carlman stated that social acceptance went beyond opinion, and was a "matter of public, political and regulatory acceptance" (Carlman, 1984, p. 339). Other scholars soon followed Carlman's work and furthered the discussion about the essential role of social acceptance in renewable energy integration (Wustenhagen et al., 2007). An example wielded from this continuum depicts social acceptance in three dimensions: socio-political, community, and market (Wustenhaen et al., 2007). Table 4 explains the core tenets of each dimension.

Table 4

Conceptual Framework of Social Acceptance

Socio-political	Community acceptance	Market acceptance
Acceptance of technologies and policies by the public, key stakeholder and policy makers	Requires procedural justice, distributional justice, and trust	Acceptance by consumers, investors, and intra-firm

Note: Adapted from Figure 1 of *Social acceptance of renewable energy innovation: An introduction to the concept*. (Wustenhagen et al., 2007, p. 2)

Additional factors have also been discussed as impactful toward social acceptance of renewable energy use—such as land expenditure, or the variety of specific community needs (Elliott, 2000). Energy leaders are indeed faced with considerations that go beyond merely implementing a new technology or process. The literature so far has shown that one of the

integration challenges is in selling a vision that is an abundant contrast to the norm. In other words, energy leaders must contemplate how to convince the energy consumer that renewables are just as reliable, affordable and available as the accustomed fossil fuel. To that end, finding public or social acceptance entails the staging of clear benefits for the consumer; whether it is financial or environmental. Quite possibly, the keystone to acceptance is the effective promotion of inarguable benefits.

Social promotion. Promoting renewable energy use has birthed a variety of strategies for its goal of increased integration. Many of these strategies are exhibited by state or federal instruments and market schemes (Ackermann, Andersson, & Söder, 2001). Schemes such as feed-in tarrifs (FIT), net metering, and tax deductions are widely practiced. Along with the U.S., nations around the world have instituted these tactics to help promote renewable energy use by consumers. For example, Europe uses FIT as their primary instrument to promote renewable energy use and production (Ackermann et al., 2001). Germany unanimously adopted a FIT program in 1990 (Hass et al., 2004). The FIT program is defined by the price per kilowatt hour (kWh) that local utility companies pay local renewable energy producers who feed energy into the local distribution grid (Ackermann et al., 2001). By promoting this type of compensation for producing renewable energy, energy consumers (e.g., homeowners) may see a potential benefit to powering alternatively (Couture & Gagnon, 2010). Other countries such as Spain since 1998, Portugal since 1998, and France since 2001, have established legislation to utilize the FIT program (Hass et al., 2004).

Using state or federal instruments are just one of the many tactics of renewable energy promotion, and several studies have examined the role and adoption of this and closely related policies (Lester, Franke, Bowman, & Kramer, 1983; Lester & Lombard, 1990; Ringquist, 1993,

2002). Recent studies have not only focused on policy as a promotional driver, but also two other promotional drivers: social and economic. Based on binary logistic regressions, one set of findings suggest that social interests measured by level of education, income, and level of participation in environmental advocacy groups is positively linked to adoption of renewable policies (Vachon, 2006).

Public opinion. Whether it centers on social acceptance or social promotion, energy leaders must continue to efficiently target the "positive" public opinion about renewable energy use. At the core of that process is to understand the characteristics which influence or motivate energy consumers to participate in the efforts to integrate renewable energy use in America. For instance, some respondents in public opinion studies have shown fair interest as participants in the quest for energy independence via renewables, but none of the respondents viewed themselves in a leadership capacity (Rogers, Simmons, Convery, & Weatherall, 2008). These results are telling, particularly, if one would consider each energy consumer as a leader in their own right within their home, community, or organization. The challenge to transform this paradigm—where one is willing to show more than just interest, but rather commit as a leader for energy change—is daunting. Nonetheless, with a clear understanding of where energy leadership should focus their techniques and strategies to achieve such an end, the difficult task may become achievable.

The research aims to take a fundamental approach to determining how to best establish social participation for renewable energy use. This approach will examine energy consumer "participation" as more of a "what would motivate" the energy consumer to use renewables. Additionally, the research will also identify a type of leadership behavior that positively correlates with the energy consumer's motivations.

Therefore, based upon the conceptual framework discussed thus far, the research collects empirical data to offer explanations of what may increase the accuracy of leadership's intent to lower America's over dependence on fossil fuel. By constructing a methodology based on the tenets of a motivational theorist, and of a behavioral theorist, a population of residential homeowners may provide explanatory, sample data to bring a set of research questions to the forefront of renewable energy integration strategy.

CHAPTER 3

Methodology

Assumptions and Rationale for Quantitative Research

The purpose of this quantitative correlational study was to explain a relationship between Victor Vroom's expectancy theory of motivation and Robert House's path-goal theory by analyzing a homeowner's motivation to use residential renewable energy applications, and by determining the homeowner's preferred leadership style. The study will utilize a quantitative research design based upon its means for testing objective theories and subsequent examinations of the relationship among variables (Creswell, 2008). Additional rationale for the quantitative design includes the paradigm's available strategies of inquiry. Due to the dual-theory and multi-variable composition of the study, along with assumptions predicting a collective strength of variables, quantitative inquiry strategies were deemed most applicable (Creswell, 2009).

Historically, strategies of inquiry related to quantitative research were of positivist worldviews. This positivist viewpoint, sometimes called the scientific method, believes that causes most probably influence efforts or outcomes (Creswell, 2009). In Creswell's (2009) book, *Research Design – Qualitative, Quantitative, and Mixed Method Approaches*, he writes of several underlying assumptions regarding the postpositivist position, such as:

1. Knowledge is conjecture
2. Research is the process of making claims and then refining or abandoning some of them for other claims more strongly warranted.
3. Data, evidence, and rational considerations shape knowledge.
4. Research seeks to develop relevant, true statements, ones that can serve to explain the situation of concern or that describe the causal relationships of interest.

5. Being objective is an essential aspect of competent inquiry; researchers must examine methods and conclusions for bias.

The positivist approach includes specific single-subject experimental studies, correlational studies, and quasi-experimental studies (Brooks, 2009; Cooper, Heron, & Heward, 1987; Neuman & McCormick, 1995). More recent quantitative inquiry strategies have included complex experiments and surveys (Babbie, 1990).

Correlational Design

The researcher chose a quantitative correlational design based upon the methodological definition and structure that such a design offers to accomplish the goals of the research. The correlational research method has been noted to establish whether two or more variables are related (Creswell, 2009). Among many statistics that express relationships between variables (such as means, variances, or relative frequencies), a correlation is also a statistical test to establish patterns for two variables (Creswell, 2008; Creswell & Plano-Clark, 2007). A correlation cannot be used to infer causation; however, a correlation should not be overlooked as an indicator of the potential existence of a variable relationship (Aldrich, 1995).

Creswell (2008) notes that there are two types of correlational designs: explanatory and prediction. The explanatory design correlates two or more variables, collects data at one point in time, and obtains at least two scores for each participant in the group, per variable (Creswell, 2008). The prediction design includes a predictor variable to forecast about an outcome in the correlational study, and a criterion variable which is the outcome being predicted (Creswell, 2008). In this study, the researcher will build an explanatory model (Babbie, 1990) to explain correlation between motivation and preferred leadership style by surveying the faculty and staff homeowners of two public institutions in the Piedmont Triad region of North Carolina about

their motivation to use residential renewable energy applications and their preferred leadership style.

In order to properly conduct a correlational study, the researcher must identify the individuals to study, identify two or more measures for each participant in the study, and ensure the size of the sample is adequate for hypothesis testing. Additionally, proper evaluation of a correlational study will make certain of adequate (a) displays of results via matrices and graphs, (b) interpretation about the direction and magnitude of the association between the two variables, (c) assess the magnitude of the relationship (based on the coefficient of determination, *p*-values, effect size or size of the coefficient), (d) identification of predictor and criterion variables, visual models that indicate the expected relationships among the variables, and (e) clearly define statistical procedures (Creswell, 2008). The researcher employed these guidelines in this study which sought to identify potential correlations between homeowner motivation and their preferred leadership style.

Role of Researcher

The study examined the motivation and preferred leadership styles of a convenience sample found within a population of faculty and staff at North Carolina A&T State University and the University of North Carolina at Greensboro. The objective for gathering this data was to provide empirical evidence to help draw conclusions, and test the research questions. Just as analyzing such relevant data is vital to fully realizing the integrity of the study, so too is it imperative for the researcher to reveal his personal role and motivation for conducting the study.

So how did the researcher, with an academic and professional background in information technology and business administration, venture to study at such magnitude the concepts of leadership and renewable energy? Besides the privileged demand of a rigorous dissertation, the

motivation to study leadership and renewable energy first began with an interest in electronics and technology. Spanning back to the days of adolescence, when an uncle exhibited the functions of his company laptop, or when family members bestowed the authority of resident technician at the age of eight years old, a curiosity was unknowingly planted that has yet to dim as an adult, and now researcher. Throughout the years, the family technician, and now researcher, unconsciously developed a fundamental lens that resolved most problems by matching logical instruction with a process, and subsequently joining that process to an outcome - just as the uncle's company laptop functioned; and just as the programming code operated throughout the researcher's formal years of academic and professional training. Ironically, this inherent technical lens transcended into the arena of leadership, wherein the researcher developed an interest in troubleshooting many of the common occurrences, problems, and phenomena found within society. To that end, the researcher truly began to realize the value of leadership and was enlightened to a program of study that was structured to cultivate the ability to effectively troubleshoot, or rather, embrace leadership.

A leadership studies program inspired the researcher to see problems from an expanded viewpoint of a leader and follower—all which started at a time none more relevant than at the brink of the 2008 economic recession. And surprisingly, the researcher's information technology and business administration lens delivered a symbiotic connection. The researcher methodically processed the 2008 economic recession as a problem, and relied on steps of resolution similar to those used over the years of study and practice as a technician. Moreover, by stepping backward from the announced point of economic recession, the researcher passed over several problematic indicators; and it just so happened that America's over dependence on fossil fuel was the most intriguing topic along that reversed troubleshooting path. As a result, the curious, family

technician became motivated to conduct a research study about a leadership solution known as renewable energy.

As the research process matured, renewable energy revealed that it has numerous technical aspects, particularly, renewable energy residential applications, which is a major component to the study. This finding added confirmation to the natural fit between the researcher and subject matter, and thusly proved to be an ever increasing motivation for further research about leadership and renewable energy. However, due to the researcher's enthusiasm toward the research topic, it is not only important to discuss the role of the researcher in the study, but also to follow strict parameters to control for the potential bias of the researcher.

A proper research study should be free of bias. Researcher biases such as any general advocacy for particular motivators or leadership styles should be controlled for by utilizing sampling techniques, documenting research limitations, and a comprehensive study design that yields trustworthy findings and accurately described data (Creswell, 2008). The remaining sections of this chapter will demonstrate how these guidelines were applied in this study.

Sample

The study used a convenience sampling technique. Convenience sampling is a method of selecting a sample randomly from a chosen population (Lunsford & Lunsford, 2005). This particular method was utilized because of limited time and funding for traditional survey testing. According to Creswell, convenience sampling is most useful when the objective is research affordability when seeking some sort of truth (Creswell, 2003). The convenience sample was drawn from a population of 5,323 faculty and staff from two public institutions in the Piedmont-Triad region of North Carolina. The institutions were selected with consideration of location,

population size, setting, and similarities within higher education. This convenience sample aimed to be representative of the population of homeowners in the Piedmont-Triad region.

As a mechanism of protection for the study sample, the researcher received approval from the International Review Board (IRB) at each institution (see Appendix A and Appendix B for the respective IRB approval letters). The IRB reviews research involving human research participants and performs ethical oversight of the research. The IRB stipulates that the researcher provide information such as why the research is being done, what the researcher will do with the participants' information, how long will the study last, and can members of the sample leave the study at any time (IRB Subjects, 2011).

The researcher administered the questionnaire with assistance from departmental administrative assistants at the two institutions. Through the administrative assistants, a letter of invitation to participate in the study was sent to 1,080 employees at the two institutions. Based on returns, 139 homeowners were identified as the convenience sample for this study. The next section describes the questionnaire, followed by a section that explains the data collection procedures in detail.

Instrumentation

The study utilized a questionnaire to collect data from a convenience sample of the faculty and staff homeowners from two public institutions in the Piedmont-Triad region of North Carolina. A questionnaire can provide baseline data on trends, attitudes or opinions, as well as allow for facilitation online. Some advantages of a questionnaire are its ease of data collection, and its capability to use frequencies to represent participant responses. Conversely, the disadvantages of a questionnaire are that the type of questions asked may risk researcher bias,

and return or response rates may be low, thus impacting the validity of the study findings (Koshy, 2005).

The Leadership Motivation Index Questionnaire (LMIQ) is an instrument developed by the researcher as an assessment designed to explain potential correlations between motivational factors and preferred leadership styles. To achieve this objective, the researcher comprised the questionnaire with (a) questions to gather demographic data; (b) questions based on the theoretical framework of path-goal model of leadership behaviors, a modified version of the Path-Goal Styles Questionnaire (Northouse, 2009); and lastly, (c) questions based on the theoretical framework of expectancy theory of motivation (Vroom, 1964). In order to establish content validity for the questionnaire, the researcher used 10 members of a pre-study sample to review the questions and format for clarity. In addition, a panel of experts also reviewed the questionnaire. The questionnaire was then modified based on this feedback. See Appendix C for a copy of the LMIQ.

The LMI Questionnaire consists of three subscales related to preferred leadership behavior (directive, supportive, and participative) and three subscales related to motivation (valence, expectancy, and instrumentality). The six scales were tested for reliability, using Cronbach's Alpha (see Table 5). Table 5 shows that each scale indicates a high level of internal consistency or reliability.

Table 5

Scale Reliability Coefficients, Means, and Standard Deviations

Scale	***M***	***SD***	**Cronbach's Alpha**
Directive	12.91	2.442	.823
Supportive	13.17	2.244	.858
Participative	13.194	2.274	.755

Table 5 (cont.)

Scale	*M*	*SD*	Cronbach's Alpha
Valence	30.47	6.427	.926
Expectancy	19.36	5.257	.810
Instrumentality	18.35	4.925	.906

Data Collection Procedures

As previously mentioned, the LMIQ was administered to the employees at two public institutions of higher education, with assistance from departmental administrative assistants at each institution. The intent of the letter of invitation was to explain the purpose of the research study and to ready the participant to anticipate receiving the questionnaire Survey Monkey web link in approximately two days (see Appendix D: Cover Letter to Participants). Once the questionnaire web link was sent, the researcher allowed up to four weeks for retrieval of completed questionnaires. This initial administration was conducted at the end of the fall 2011 semester and only yielded 23 responses. Since the researcher had received an email database from the administrative assistants, he decided to directly contact the employees himself as the first follow-up in January. This follow-up yielded 161 responses; 139 of whom were identified as homeowners. Total time from first administration of the questionnaire to follow-up was two months.

Data Analysis Procedures

There are two fundamental motives to analyze data: (a) to describe basic features of the sample data and (b) to reach conclusions that go beyond the sample data alone. The first, descriptive statistics, characterize the distribution of a set of observations, thus providing summary measures to understand the occurrence within the statistics (Jargowsky & Yang, 2005). The second, inferential statistics, allow the researcher to draw conclusions about the unknown

constraints based on the statistics that describe the sample (Jargowsky & Yang, 2005). Since this study aimed to explain potential relationships between two variables—motivation and preferred leadership style—the application of both descriptive and inferential statistical analyses was mandated.

In spite of using inferential analysis, the researcher understands that although statistical calculations often attempt to determine a cause and effect or make predictions, the statistical findings do not always prove causality (Green & Salkind, 2007). To aid in the ultimate conclusion of actual causality, or in an effort to support a hypothesized theory about the relationship of two variables, inferential statistics offer some common techniques, such as chi-square tests, analysis of variance, analysis of covariance, Pearson's correlation (r), regression analysis, logistic regression analysis, discriminant analysis, factor analysis, and forecasting (Bernstein & Bernstein, 1999).

In order to prepare the data for analysis, each of the variables were coded within an SPSS/PASW software application. The demographic data (gender, ethnicity, age, education, and income) were analyzed using frequencies, measures of central tendency (means), and measures of spread (standard deviation and variance). Data related to the six scales were analyzed via descriptive statistics and inferential statistics (Cronbach's alpha and Pearson's correlation coefficient). Pearson's *r* and a comparison of means were used to analyze relationships between the demographic data and the six subscales.

The leadership behavior scales were analyzed by creating composite variables within SPSS/PASW, calculated by including only specific questions for each respective leadership behavior. *Directive* was measured by the total sum of SPSS/PASW question variables, coded, Q0008_0001, Q0008_0004, and Q0008_0007. *Supportive* was measured by the total sum of

SPSS/PASW question variables, coded, Q0008_0002, Q0008_0005, and Q0008_0008. *Participative* was measured by the total sum of SPSS/PASW question variables, coded, Q0008_0003, Q0008_0006, and Q0008_0009.

The motivational construct scales were analyzed by creating composite variables within SPSS/PASW, calculated by including only specific questions for each respective motivational construct. *Valence* was measured by the total mean of SPSS/PASW question variables, coded, Q0009_0001 - Q0009_0005. *Expectancy* was measured by the total mean of SPSS/PASW question variables, coded, Q0010_0001 - Q0010_0006. *Instrumentality* was measured by the total mean of SPSS/PASW question variables, coded, Q0011_0001 - Q0011_0005.

To analyze relationships between the demographic data and six scales, the demographic data were recoded into macrolevel variables. For example, male and female were recoded into a new variable labeled gender. Likewise the microlevel categories of other demographic data were recoded into macrolevel variables of ethnicity, age, education, and income.

Validity and Generalizability of the Study

Colorado State University (2011) defines generalizability as when the statistical conclusions of a sample may also be applied to the population at large. Select literature considers generalizability necessary for the usefulness of a research theory; however, such literature also expresses that it may not always exist as validation for the research theory or study findings (Lee & Baskerville, 2003). The nature of providing research validity or reliability may contend with the often gray area of generalizability, and the study acknowledges that fact by offering a theoretical foundation and statistical conclusions which are receptive to many contexts and populations. In respect to the current study, Cronbach's alpha was applied to the six primary scales. Cooper and Schindler (2006) explain Cronbach's alpha as a measurement of consistency

for the responses in a given survey. The responses for each of the primary scales were calculated as reliable.

The researcher in the study will exhibit a variety of measures to minimize potential bias throughout the process of developing a hypothesis, research questions, data generation and collection, and deliberating conclusions. All demographic details of the respondents will discuss any lack of preferred stratification in the findings and conclusion section of the study. In such case where stratification is achieved, the data will reflect relevant proportions of ethnicity, gender, household income, and education level.

By researching the relationship between motivation and preferred leadership style amongst the faculty and staff of two public institutions in the Piedmont-Triad region of North Carolina, the study can offer further explanation and evidence of individual motivations and leadership preferences. The results may be transferable to a variety of renewable energy contexts. Likewise, the concept of determining whether a motivation construct has an intrinsic relationship with a leadership style can be generalized within seemingly any topic. Lastly, the results within the study could be considered generalizable to the population of homeowners in the Piedmont Triad region.

CHAPTER 4

Results and Analysis

The purpose of this quantitative correlational study was to explain the relationship between homeowners' preferred leadership style and their motivation to use sustainable energy. To accomplish this objective, the study was framed by the following four research questions: (a) Which of Victor Vroom's expectancy motivation constructs do residential homeowners rate as most influential? (b) Which of Robert House's path-goal leadership styles do residential homeowners most prefer? (c) What is the relationship between leader style and motivational construct? (d) What are implications for the sociopolitical context of renewable energy?

A Leadership Motivation Index (LMI) was administered to faculty at two public institutions of higher education in North Carolina. Chapter 4 presents the statistical analyses of the data obtained from this instrument. Reliability statistics for the instrument were presented in Chapter 3. The content of this chapter begins with an analysis of the demographic data. This is followed by an examination of descriptive and inferential statistics related to the LMI subscales. The remainder of the chapter looks at correlations between the demographic data and the LMI subscales.

Analysis of Demographic Data

The population for this research included faculty and staff employees from two public institutions in the Piedmont-Triad region of North Carolina. The sample for this research included 139 participants who were identified as homeowners. The sample consisted of 105 *UGS* participants and 34 *ATA* participants (see Table 6). The sample consisted of 95 *Females* and 44 *Males* (see Table 7). The race and ethnicity demographic totaled 32 *African-Americans*, 103 *Caucasians*, 1 *Latino*, 4 *Asians*, 1 *American Indian*, and 1 *Native American* (see Table 8).

Table 6

Participant Distribution by Institution

Institution	# of Participants	Institution Location
ATA	34	Greensboro, North Carolina
UGS	105	Greensboro, North Carolina

Table 7

Frequency Distribution Gender

Gender	*n*	%
Male	44	32
Female	95	68

Table 8

Frequency Distribution Race/Ethnicity

Institution	*n*	%
African-American	32	23.0
Caucasian	103	74.0
Latino	1	0.7
Asian	4	3.0
American Indian	1	0.7
Native American	1	0.7

The participant ages within the sample were distributed by range, with the largest percentage of participants falling within the *51-60* range (see Table 9). The education level of the sample ranged from *High School*, *Some College*, *Community College*, *College (BA/BS)*, and *Graduate/Professional*. The largest percentage of education level was *Graduate/Professional* (see Table 10). The final sample demographic was household income, whereby distribution ranges began from *$10,000 to $39,999* and ended with equal to or greater than *$160,000*. The *$70,000 to $99,999* range constitutes the largest percentage of household income (see Table 11).

Table 9

Frequency Distribution Age Level

Age	*n*	%
Less than 25	0	0
25-32	11	8
33-40	22	16
41-50	34	25
51-60	44	32
60 +	28	20

Table 10

Frequency Distribution Educational Level

Education	*n*	%
High School	3	2
Some College	6	4
Community College	6	4
College (BA/BS)	24	17
Graduate/Professional	101	73

Table 11

Frequency Distribution Household Income Level

Household Income	*n*	%
$10,000 to $39,999	4	3
$40,000 to $69,999	32	23
$70,000 to $99,999	55	40
$100,000 to $129,999	30	22
$130,000 to $159,999	10	7
$160,000 +	9	7

Analysis of LMI Subscales

This section looks at descriptive and inferential statistics related to the six subscales on the LMI. There are three leadership subscales: directive, supportive, and participative. There are three motivation subscales: valence, expectancy, and instrumentality. Descriptive statistics include frequency distributions, measures of central tendency (mean), and measures of spread (standard deviation and variance). Inferential statistics include a test of significance among the six subscales.

Descriptive statistics. Measures of central tendency (mean) and spread standard deviation) for each item on each subscale are presented first, followed by summary frequency statistics for each subscale. Item eight on the LMI had nine questions that measured leadership behavior. Questions 1, 4, and 7 comprise the directive leadership subscale. Questions 2, 5, and 8 make up the supportive leadership subscale. Participative leadership is composed of questions 3, 6, and 9. Responses for all nine questions are based on a five-point Likert scale: 1 = Never, 2 = Seldom, 3 = Sometimes, 4 = Often, and 5 = Always. Tables 12 through 14 show the mean (*M*) and standard deviation (*SD*) for each question.

Table 12

Measures of Central Tendency and Spread for Questions Related to the Directive Leadership Subscale

LMI Question	*n*	*M*	*SD*
I prefer a leader who gives clear explanations of their expectations of me	139	4.59	0.849
I prefer a leader who gives explicit instructions regarding tasks	139	3.94	1.055
I prefer a leader who gives clear directions regarding projects	139	4.37	0.92684

Table 13

Measures of Central Tendency and Spread for Questions Related to the Supportive Leadership Subscale

LMI Question	*n*	*M*	*SD*
I prefer a leader who shows interest in my personal well-being	139	4.21	.936
I prefer a leader who shows interest in my personal and professional development	139	4.38	.838
I prefer a leader who listens to others, and provides encouragement	139	4.58	.761

Table 14

Measures of Central Tendency and Spread for Questions Related to the Participative Leadership Subscale

LMI Question	*n*	*M*	*SD*
I prefer a leader who invites me to participate in decision making	139	4.42	.798
I prefer a leader who solicits suggestions from myself and others before making a decision	139	4.32	.845
I prefer a leader who is receptive to ideas from myself and others	139	4.45	1.105

Item nine on the LMI measured the valence motivational construct. Respondents were asked to rate incentives related to their willingness to use renewable energy applications within their homes. They were given seven options along a continuum from Highly Attractive to Highly Unattractive; their responses were initially coded from 1 (Highly Unattractive) to 7 (Highly Attractive). In order to compare a similar Likert scale reange of means for all of the subscales, the ranges for valence were collapsed and recoded along a continuum of 1 to 5. One and two were recoded as 1, three was recoded as 2, four was recoded as 3, five was recoded as 4,

and six and seven were recoded as 5. Table 15 gives the mean and standard deviation for the questions related to the valence motivational construct.

Table 15

Measures of Central Tendency and Spread for Questions Related to the Valence Motivational Construct Subscale

LMI Question	*n*	*M*	*SD*
Help reduce global warming and carbon pollution	139	4.19	1.095
Help stimulate state and local economies for job growth	139	4.25	1.008
Increase your amount of available Tax Credits/Deductions	139	4.32	1.009
Increase your home's market value	139	4.42	0.955
Lower your monthly utility bill	139	4.50	1.038

Item 10 on the LMI asked respondents to rate their likelihood to perform tasks associated with renewable energy integration within their homes. A five-point Likert scale was employed for this item: 1 = Very Unlikely, 2 = Unlikely, 3 = Neither Likely or Unlikely, 4 = Likely, and 5 = Very Likely. Table 16 includes the means and standard deviations for the expectancy motivation construction questions.

Table 16

Measures of Central Tendency and Spread for Questions Related to the Expectancy Motivational Construct Subscale

LMI Question	*n*	*M*	*SD*
Conduct monthly expense and energy use analysis in order to monitor renewable energy efficiency	139	3.17	1.260

Table 16 (cont.)

LMI Question	*n*	*M*	*SD*
Consistently close all window thermo-shutters at night as a heat loss prevention technique during the winter	139	4.03	1.197
Consistently open and close windows throughout the day to maximize peak ventilation and home cooling during the summer	139	3.42	1.351
Sleep directly on a water bed as a cooling technique, allowing the water bladder to conduct heat away from your body during warm nights	139	1.89	1.105
Use less hot water after the sun goes down to ensure the use of solar heated water opposed to conventional electric heated water	139	3.19	1.213
Use only specific paints and materials on the roof and walls of your home as a technique to properly reflect or absorb sunlight	139	3.66	1.201

Item 11 on the LMI asked respondents to rate their beliefs about outcomes they might achieve by performing tasks identified in Item 10. A five-point Likert scale was also employed for Item 11: 1= Disbelieve, 2= Disbelieve, 3= Neither Believe or Disbelieve, 4= Believe, and 5= Believe Strongly. Table 17 presents the means and standard deviations for the instrumentality motivational construct. Tables 18 and 19 show summary measures of central tendency and spread for each subscale (grand mean, standard deviation, and variance). These summary statistics indicate that (a) supportive leadership behavior is the most preferred, with the highest grand mean of 13.17 and (b) the valence motivational construct is the most influential, with the highest grand mean of 21.69.

Table 17

Measures of Central Tendency and Spread for Questions Related to the Instrumentality Motivational Construct Subscale

LMI Question	*n*	*M*	*SD*
Help Reduce Global Warming and Carbon Pollution	139	3.79	1.210
Help Stimulate state and local economies for job growth	139	3.49	1.229
Increase Amount of available Tax Credits/Deductions	139	3.55	1.137
Increase Your Home's Market Value	139	3.50	1.224
Lower Your Monthly Utility Bill	139	4.01	0.955

Table 18

Summary Frequency Distribution of Preferred Leadership Behavior

Scale	*n*	*M*	*SD*
Directive	139	12.85	2.644
Supportive	139	13.17	2.244
Participative	139	12.94	3.100

Table 19

Summary Frequency Distribution of Motivational Construct

Scale	*n*	*M*	*SD*
Valence	139	21.69	4.520
Expectancy	139	19.07	5.738
Instrumentality	139	18.13	5.446

Correlations between LMI subscales. Correlations between the six subscales were conducted to determine if there were any relationships between the subscales. The guidelines (Lind, Marchal, & Wathen, 2005) for interpreting the strength of correlation as measured by Pearson's Correlation Coefficients (*r*) are presented in Table 20.

Table 20

Guidelines for Interpreting the Strengths of Pearson's Correlation Coefficient

Strength of Association	Positive Correlation Coefficient	Negative Correlation Coefficient
Weak	.1 to .3	-0.1 to -0.3
Medium	.3 to .5	-0.3 to -0.5
Strong	.5 to 1.0	-0.5 to -1.0

Table 21 indicates that the strongest relationship between the valence motivational construct and leadership behavior is between valence and supportive leadership behavior, showing medium strength of association (r=.386); this relationship is statistically significant at the .01 level. The relationship between valence and directive leadership is weak to medium (r= .318) and the relationship between valence and participative leadership is weak (r=.263).

Table 21

Correlations between the Motivational Construct of Valence and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	.318**	.000
Supportive	139	.386**	.000
Participative	139	.263**	.002

Note. ** Correlation is significant at the 0.01 level (2-tailed); * $p < .05$.

Table 22 indicates that the second strongest relationship is between expectancy and directive leadership behavior with a medium r of .329; this relationship is statistically significant at the .01 level. The relationship between expectancy and supportive leadership is weak (r=.297). There is not a relationship between expectancy and participative leadership (r=.093).

Table 22

Correlations between the Motivational Construct of Expectancy and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	.329**	.000
Supportive	139	.297**	.000
Participative	139	.093	.275

Note. **Correlation is significant at the 0.01 level (2-tailed); *$p < .05$.

Table 23 indicates that the strongest relationship is between instrumentality and supportive leadership behavior, although it is at the low to medium level (r = .309). This relationship is statistically significant at the .01 level. The relationships between instrumentality and both directive leadership and participative leadership are weak (r=.257 and r=.142).

Table 23

Correlations between the Motivational Construct of Instrumentality and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	.257**	.002
Supportive	139	.309**	.000
Participative	139	.142	.095

Note. **Correlation is significant at the 0.01 level (2-tailed); *$p < .05$.

Analysis of Correlations between Demographic Data and LMI Subscales

Macrolevel and microlevel analyses were conducted on the demographic data and LMI subscales. In order to conduct macrolevel correlations between the demographic data and the six LMI subscales, the demographic data was recoded into six macro variables: gender, ethnicity, age, education, income, and institution. To further tease out relationships between the

demographic data and the LMI subscales, comparisons of means were conducted on the specific categories within the six macro variables. For example, the comparison of means of males and females (gender macro variable) were correlated with directive, supportive, participative leadership behavior, etc.

As reflected in Table 24, there is no relationship between gender and preferred leadership behavior. Further analysis of the specific groups by comparing means (see Table 25) shows similar means for males and females on preferred leadership behavior, with both genders preferring a *Supportive* behavior.

Table 24

Correlations between Gender and the Preferred Leadership Behavior

Behavior	***n***	**Pearson Correlation**	**Sig. (2-tailed)**
Directive	139	.022	.801
Supportive	139	.050	.556
Participative	139	-.014	.868

Table 25

Comparison of Means across Gender Groups and Preferred Leadership Behaviors

Gender		**Directive**	**Supportive**	**Participative**
Male	*M*	12.77	13.00	13.00
	n	44	44	44
	SD	2.69	2.65	3.18
Female	*M*	12.89	13.24	12.91
	n	95	95	95
	SD	2.64	2.04	3.08

As reflected in Table 26, there is a weak, negative relationship between ethnicity and preferred leadership behavior. Further analysis of the specific groups by comparing means (see Table 27) shows similar means for each ethnicity on preferred leadership behavior. Except for Asian participants, racial/ethnic minority group means show a preference for *Directive* behavior, while the majority group mean shows a preference for *Supportive* behavior.

Table 26

Correlations between Ethnicity and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	-.180*	.034
Supportive	139	-.192*	.023
Participative	139	-.212*	.012

Note. **Correlation is significant at the 0.01 level (2-tailed); *$p < .05$.

Table 27

Comparison of Means across Ethnicity Groups and Preferred Leadership Behaviors

Ethnicity		Directive	Supportive	Participative
Hispanic	*M*	14.00	13.00	11.00
	N	1	1	1
	SD	.	.	.
White	*M*	13.00	13.48	13.39
	N	103	103	103
	SD	1.81	1.47	2.30
Black	*M*	12.81	12.28	11.63
	N	32	32	32
	SD	3.75	3.63	4.68

Table 27 (cont.)

Ethnicity		Directive	Supportive	Participative
American Indian	*M*	15.00	15.00	15.00
	N	1	1	1
	SD	.	.	.
Asian	*M*	9.25	12.25	11.5
	N	4	4	4
	SD	6.89	2.99	2.65
Pacific Islander	*M*	14.00	13.00	12.00
	N	1	1	1
	SD	.	.	.

As reflected in Table 28, there is no relationship between age and preferred leadership behavior. Further analysis of the specific groups by comparing means (see Table 29) shows similar means for each age range on preferred leadership behavior. When comparing the means, all ages prefer *Supportive* behavior—except for the 51-60 age range, which prefer *Participative* behavior.

Table 28

Correlations between Age and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	.021	.809
Supportive	139	.053	.536
Participative	139	.040	.639

Table 29

Comparison of Means across Age Groups and Preferred Leadership Behaviors

Age		Directive	Supportive	Participative
25-32	*M*	11.91	12.09	12.00
	N	11	11	11
	SD	4.16	4.30	4.17
33-40	*M*	13.41	13.55	13.41
	N	22	22	22
	SD	3.32	3.20	3.22
41-50	*M*	13.06	13.32	12.68
	N	34	34	34
	SD	1.82	1.72	3.46
51-60	*M*	12.45	12.98	13.09
	N	44	44	44
	SD	2.77	1.58	2.60
60+	*M*	13.18	13.39	13.00
	N	28	28	28
	SD	1.87	1.62	2.92

As reflected in Table 30, there is only one weak, negative relationship between education and preferred leadership behavior, which is the directive behavior. Further analysis of the specific groups by comparing means (see Table 31) shows similar means for each level of education on preferred leadership behavior, except for the *Some College* and *Community College* subgroup. These were also the only education levels to prefer *Directive* leadership behavior, whereas the remaining education levels prefer *Supportive*.

Table 30

Correlations between Education and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	-.208*	.014
Supportive	139	-.112	.188
Participative	139	-.001	.995

Table 31

Comparison of Means across Education Groups and Preferred Leadership Behaviors

Education		Directive	Supportive	Participative
Completed High School	*M*	14.33	13.67	14.00
	N	3	3	3
	SD	1.15470	1.15470	1.73205
Some College	*M*	14.17	13.17	12.83
	N	6	6	6
	SD	1.17	1.72	1.94
Community College	*M*	14.17	14.50	12.17
	N	6	6	6
	SD	1.33	1.22	6.01
College (BS, BA)	*M*	13.43	13.61	12.87
	N	23	23	23
	SD	1.50	1.37	3.06
Graduate/Professional Degree	*M*	12.52	12.97	12.97
	N	101	101	101
	SD	2.92	2.47	3.01

As reflected in Table 32, there is no relationship between income and preferred leadership behavior. Further analysis of the specific groups by comparing means (see Table 33) shows similar means for each range of income on preferred leadership behavior. Also based upon a comparison of group means, household incomes of either less than $40,000 or greater than $130,000 prefer *Directive* leadership behavior, while most incomes ranges prefer *Supportive*.

Table 32

Correlations between Income and the Preferred Leadership Behavior

Behavior	n	Pearson Correlation	Sig. (2-tailed)
Directive	139	-.062	.466
Supportive	139	-.081	.343
Participative	139	-.093	.275

Table 33

Comparison of Means across Income Groups and Preferred Leadership Behaviors

Income		Directive	Supportive	Participative
$10,000 to $39,999	*M*	15.00	14.00	14.00
	N	4	4	4
	SD	.00000	1.41421	.81650
$40,000 to $69,999	*M*	13.35	13.42	13.58
	N	31	31	31
	SD	2.89	2.83	2.80
$70,000 to $99,999	*M*	12.56	13.16	12.75
	N	55	55	55
	SD	3.09	2.39	3.44
$100,000 to $129,999	*M*	12.17	12.80	12.60
	N	30	30	30
	SD	1.72	1.47	2.69
$130,000 to $159,999	*M*	14.00	13.50	12.60
	N	10	10	10
	SD	1.15	1.72	4.55
$160,000+	*M*	13.00	12.78	12.89
	N	9	9	9
	SD	2.29	2.28	1.83

As reflected in Table 34, there is a weak, positive relationship between institution and two of the preferred leadership behaviors. Further analysis of the specific groups by comparing means (see Table 35) shows similar means for each institution on the preferred leadership behavior. Although a slight difference, the ATA institution prefers a *Directive* behavior, and the UGS institution prefers a *Supportive* behavior.

Table 34

Correlations between Institution and the Preferred Leadership Behavior

Behavior	*n*	Pearson Correlation	Sig. (2-tailed)
Directive	139	.096	.261
Supportive	139	.259**	.002
Participative	139	.172**	.043

Table 35

Comparison of Means across Institution Groups and Preferred Leadership Behaviors

Institution		Directive	Supportive	Participative
ATA	*M*	12.41	12.15	12.00
	N	34	34	34
	SD	3.71	3.56	4.13
UGS	*M*	13.00	13.49	13.24
	N	105	105	105
	SD	2.19	1.49	2.64

As reflected in Table 36, there is no relationship between gender and motivational construct. Further analysis of the specific groups by comparing means (see Table 37) shows similar means for males and females on the three motivational constructs. In addition, the comparison of means shows that males and females are more motivated by valence.

Table 36

Correlations between Gender and the Motivational Constructs

Construct	*n*	Pearson Correlation	Sig. (2-tailed)
Valence	139	.054	.525
Expectancy	139	.030	.724
Instrumentality	139	.068	.430

Table 37

Comparison of Means across Gender Groups and Motivational Constructs

Gender		Valence	Expectancy	Instrumentality
Male	*M*	21.05	18.82	17.59
	N	44	44	44
	SD	5.03	5.47	5.92
Female	*M*	21.99	19.19	18.38
	N	95	95	95
	SD	4.26	5.88	5.23

As reflected in Table 38, there is no relationship between ethnicity and motivational construct. Further analysis of the specific groups by comparing means (see Table 39) shows similar means for the ethnicities on the three motivational constructs. A comparison of means also shows that each ethnicity is more motivated by valence.

Table 38

Correlations between Ethnicity and the Motivational Constructs

Construct	***n***	***Pearson Correlation***	***Sig. (2-tailed)***
Valence	139	-.010	.905
Expectancy	139	.053	.536
Instrumentality	139	.069	.422

Table 39

Comparison of Means across Ethnicity Groups and Motivational Constructs

Ethnicity		Valence	Expectancy	Instrumentality
Hispanic	*M*	25.00	22.00	17.00
	N	1	1	1
	SD	.	.	.

Table 39 (cont.)

Ethnicity		Valence	Expectancy	Instrumentality
White	*M*	21.74	18.97	17.71
	N	103	103	103
	SD	4.00	5.03	5.23
Black	*M*	21.47	19.16	19.56
	N	32	32	32
	SD	6.10	7.87	6.03
American Indian	*M*	25.00	24.00	25.00
	N	1	1	1
	SD	.	.	.
Asian	*M*	22.25	21.00	17.50
	N	4	4	4
	SD	2.99	2.83	5.51
Pacific Islander	*M*	23.00	21.00	14.00
	N	1	1	1
	SD	.	.	.

As reflected in Table 40, there is no relationship between age and motivational construct. Further analysis of the specific groups by comparing means (see Table 41) shows similar means for age ranges on the three motivational constructs. Another comparison of means shows that each of the age ranges are more motivated by valence.

Table 40

Correlations between Age and the Motivational Constructs

Construct	*n*	Pearson Correlation	Sig. (2-tailed)
Valence	139	.011	.895
Expectancy	139	.069	.418
Instrumentality	139	.047	.580

Table 41

Comparison of Means across Age Groups and Motivational Constructs

Age		Valence	Expectancy	Instrumentality
25-32	*M*	21.09	19.55	17.00
	N	11	11	11
	SD	7.22	6.86	6.54
33-40	*M*	21.4091	18.00	17.77
	N	22	22	22
	SD	5.06	5.64	5.15
41-50	*M*	22.03	19.03	18.62
	N	34	34	34
	SD	2.46	5.45	3.79
51-60	*M*	21.20	18.77	18.07
	N	44	44	44
	SD	5.64	6.72	5.98
60+	*M*	22.50	20.25	18.36
	N	28	28	28
	SD	2.39	3.90	6.29

As reflected in Table 42, there is no relationship between education and motivational construct. Further analysis of the specific groups by comparing means (see Table 43) shows similar means for education levels on the three motivational constructs. Additionally, the comparison of means shows that all of the education levels are more motivated by valence.

Table 42

Correlations between Education and the Preferred Leadership Behavior

Construct	*n*	Pearson Correlation	Sig. (2-tailed)
Valence	139	-.007	.935
Expectancy	139	-.114	.183
Instrumentality	139	-.022	.794

Table 43

Comparison of Means across Education Groups and Motivational Constructs

Education		Valence	Expectancy	Instrumentality
Completed High School	*M*	21.00	18.67	18.67
	N	3	3	3
	SD	1.00	.58	1.53
Some College	*M*	22.00	22.33	16.33
	N	6	6	6
	SD	2.45	3.01	8.36
Community College	*M*	23.83	22.00	21.00
	N	6	6	6
	SD	2.40	4.38	3.37
College (BS, BA)	*M*	22.30	18.83	18.43
	N	23	23	23
	SD	5.29	6.72	6.87
Graduate/Professional Degree	*M*	21.43	18.77	17.98
	N	101	101	101
	SD	4.58	5.73	5.07

As reflected in Table 44, there is no relationship between income and motivational construct. Further analysis of the specific groups by comparing means (see Table 45) shows similar means for each household income range on the three motivational constructs. In addition, the comparison of means shows that all incomes had a slight preference for valence.

Table 44

Correlations between Income and the Motivational Constructs

Construct	*n*	Pearson Correlation	Sig. (2-tailed)
Valence	139	.101	.238
Expectancy	139	-.018	.832
Instrumentality	139	.059	.487

Table 45

Comparison of Means across Income Groups and Motivational Constructs

Income		Valence	Expectancy	Instrumentality
	M	23.75	19.25	22.50
$10,000 to $39,999	*N*	4	4	4
	SD	2.50	2.06	2.38
	M	21.03	18.77	16.90
$40,000 to $69,999	*N*	31	31	31
	SD	5.14	5.77	5.65
	M	21.05	19.58	17.80
$70,000 to $99,999	*N*	55	55	55
	SD	5.62	6.19	6.06
	M	22.83	18.47	18.97
$100,000 to $129,999	*N*	30	30	30
	SD	1.89	6.50	3.17
	M	23.20	19.30	19.80
$130,000 to $159,999	*N*	10	10	10
	SD	1.81	4.35	4.34
	M	21.44	18.67	17.78
$160,000+	*N*	9	9	9
	SD	2.65	2.06	7.89

As reflected in Table 46, there is no relationship between institution and motivational construct. Further analysis of the specific groups by comparing means (see Table 47) shows similar means for both institutions on the three motivational constructs. In addition, the comparison of means shows that each institution had a slight preference for valence.

Table 46

Correlations between Institution and the Motivational Constructs

Construct	*n*	Pearson Correlation	Sig. (2-tailed)
Valence	139	.104	.224
Expectancy	139	.063	.463
Instrumentality	139	-.085	.319

Table 47

Comparison of Means across Institution Groups and Motivational Constructs

Institution		Valence	Expectancy	Instrumentality
ATA	*M*	20.91	18.44	18.94
	N	34	34	34
	SD	5.87	7.58	5.97
UGS	*M*	21.94	19.28	17.87
	N	105	105	105
	SD	3.99	5.03	5.27

Note. ATA=Institution 1, UGS=Institution 2

Summary of Results

The sample for this research included faculty and staff employees from two public institutions in the Piedmont-Triad region of North Carolina—25% from Institution *ATA* and 75% from Institution *UGS*. The frequency of males within the sample was 32% and the frequency of females was 68%. Demographically, the sample's primary groups were African-Americans and Caucasians, with frequencies of 23% and 74%, respectively. The sample's level of completed education was the narrowest of demographic frequencies, where 73% possess graduate or professional degrees. And the most diverse of demographics, total household income and age range, reported 55% of the participant's total household income falling within $70,000 - $99,999, and 44% of the participants being within 51-60 years of age.

The study participants were asked to respond with the opinions about their preferred leadership behavior, as well as, their motivational influences to use renewable energy within their home. Six primary scales were created to collect this data, and a set of specific questions were coded to measure the sample's particular opinions about leadership behavior and motivation.

The leadership behavior questions showed the sample to overall prefer leaders who exhibit supportive leadership behavior. With further analysis of this scale also found that questions directly related to *supportive* leadership behavior indicated a more favorable mean score for leaders who listen to others and provide encouragement (see Table 4.8).

The motivational construct found as most influential within the sample was *valence*. Questions distinctly assigned to measure the sample's opinion of valence were most highly influenced to use renewable energy within the home if monthly utility bills were lowered (see Table 15).

Additional analyses were conducted to help address the sociopolitical context by further analyzing relationships between leadership behavior, motivation, and demographic variables. This procedure was executed to not only support the aforementioned measures of central tendency within the sample, but to also provide (a) levels of correlation between the core scales (leadership behavior and motivation); and (b) to provide the strengths of correlation when the core scales were coupled with the demographic groups through a comparison of means. As such, the results were determined by calculating the Pearson Correlation Coefficient between scales and demographics, and by simply comparing the demographic response (mean) relative to either preferred leadership behavior or motivational construct.

Pearson Correlation Coefficient establishes strength of correlation between two variables. In the case of this study, the two primary variables are between motivational construct and leadership behavior. Based upon the overall participant responses, certain motivational constructs and preferred leadership behaviors showed stronger correlations than others. When the entire sample was tested, the strongest correlation was found between the valence motivational construct and the supportive leadership behavior (r = .386). In succeeding order, the second strongest relationship was between the expectancy motivational construct and the directive leadership behavior (r = .329); and followed by the correlational level between instrumentality motivational construct and the supportive leadership behavior (r = .309). All of which were found as statically significant.

To move from the previous macrolevel analysis of the correlational strengths found within the data (i.e., homeowners), a microlevel analysis was conducted to find the strengths of correlation between (a) the demographic variables (e.g. age, income, education, etc.) and primary scales (i.e., preferred leadership behavior and motivational construct); along with (b) the correlations between demographic subsets (age range, income range, education level, etc.) and primary scales (preferred leadership behavior and motivational construct). A secondary analysis, comparison of means, was conducted concurrently with the Pearson correlations. This secondary test of comparing means amongst the demographics allowed a supplemental illustration to the Pearson Correlations, as well as, a general synopsis of how each demographic responded when queried for levels of preferred leadership behaviors and motivational construct.

The leadership behavior analyses found only two demographics to show statistically significant correlation. The first, the ethnicity demographic, showed a medium strength Pearson correlation with a supportive leadership behavior. When the ethnicity demographic was tested by

subset, Caucasian participants revealed a preference for leaders with supportive leadership behavior, while the remaining (excluding the Asian participants) indicated a preference for leaders with directive leadership behavior (see Table 27). The second statically significant correlation, the institution demographic, also showed a medium strength Pearson correlation with a supportive leadership behavior. When the subsets were analyzed, institution ATA preferred a leader with a directive leadership behavior, while institution UGS preferred leadership with a supportive leadership behavior (see Table 35).

Conversely, the motivation analyses were unable to find statistically significant correlations between the demographics and motivational constructs. Although the demographic correlations were of low strength and were statistically insignificant, a few of the demographic subsets showed noteworthy gaps in central tendency (mean). The data analyses, based upon a comparison of motivational construct means by demographic (e.g. age, income, education level, etc.) found very similar results for participant's opinion of valence and instrumentality. However, the expectancy (mean) scores of a few demographic subsets revealed a decent variation in motivational construct. For example, depending on range of age, the expectancy motivational construct had a greater influence for some than others in the age subset. Table 41 illustrates that the 60+ subset is more influenced by the expectancy motivational construct than the 33-40 subset. In another example of contrasting motivational construct means, Table 43 shows that study participants who have partially completed some level of college are more influenced by the expectancy motivational construct than those study participants who have completed a graduate or professional degree.

Now equipped with a full data analysis, this study can proceed with a discussion on how the results of the research interconnect with leadership and renewable energy integration.

CHAPTER 5

Discussion and Implications

The purpose of this quantitative correlational study was to explain the relationship between homeowners' preferred leadership behavior and their motivation to use sustainable energy. To accomplish this objective, the study was framed around the following four research questions: (a) Which of Victor Vroom's expectancy motivation constructs do residential homeowners rate as most influential? (b) Which of Robert House's path-goal leadership behaviors do residential homeowners most prefer? (c) What is the relationship between leader behavior and motivational construct? (d) What are implications for the sociopolitical context of renewable energy integration?

This final chapter will begin by providing a summary of the study's originating problem and overview of the theoretical orientation. The subsequent content will then discuss the results of the study followed by devising implications regarding practicality, leadership and theory. To conclude this chapter and study, recommendations for future research, potential limitations of the research, and final thoughts on the research will be discussed.

When relatively compared with the international community, the United States stands alone in their level of fossil fuel consumption. With a growing population of over 307 million and a military branch that happens to be the largest energy consuming department in the world, these mere two examples are why alternatively sourcing America's energy consumption has been an imperative since the Jimmy Carter administration. As the world's third largest producer of fossil fuel, America's demand outweighs its own supply, resulting in importing 60% of its oil from nations like Canada, Mexico, Venezuela, and Saudi Arabia. Particularly since the 2008 global economic downturn, American leadership has acknowledged a dire need, now more than

ever, to establish strategies to integrate the use of alternative energy for protection of national security and economic stability. However, history has shown this initiative to be problematic, as in, despite the decades of effort by presidential administrations, scientists, and environmentalists to lessen fossil fuel use with alternative sources of energy, their quests have produced miniscule results.

Data has shown an almost anemic increase in alternative energy production while a blistering growth in fossil fuel consumption (Byrnea, Hughes, Rickerson, & Kurdgelashvilla, 2007). Hence, this study chose to conduct research which focused on providing formative data and explanation for leadership to use in developing more effective strategies and techniques for renewable energy integration. Conceptually, the research began by starting back at ground zero, deciding to simply measure the current fortitude of who the researcher finds as the biggest factor to renewable energy's successful integration – the mindset of the energy consumer. This premise argues that if American leaders were privy to what most stimulates an individual's, or rather, energy consumer's motivation to adopt renewable energy applications, the path toward energy independence may become one step closer.

The study utilized two theoretical frameworks to help guide the measurement of an individual's level of motivation to integrate renewable energy use. The first theory, expectancy of motivation by Victor Vroom, suggests that an individual makes a decision based upon their level of motivational force, and that force is computed by examining three constructs: *valence*, *expectancy*, and *instrumentality*. Vroom explained *valence* as the value one may perceive of the said outcome; *expectancy* as the belief of capability that one may possess to accomplish a set goal; and *instrumentality* as one's belief that if they complete certain actions, the outcome will be achieved (Vroom, 1964). In the case of this research, the sample of North Carolina Piedmont

Triad homeowners were presented questions formulated to discover if their total motivation to integrate renewable energy within their home was influenced more by (a) what they value most if willing to integrate; (b) what they are willing to do in order to reach that value; or (c) whether or not they believe that by doing those suggested behaviors will actually result in what they valued the most.

The second theory, path-goal theory by Robert House, provided the pivotal leadership component to the study. House suggests that leaders can effectively lead by exhibiting either (a) *directive*, task list oriented behavior; (b) *supportive*, focused only on sub-ordinate needs behavior; or (c) *participative*, asks followers for suggestions before making decisions behavior. By including House's path-goal theory, the study not only has Vroom's assessment of the sample's motivational force, but now allows the research to collect the sample's preference of leadership behavior. Moreover, this framework can gather each sample participant's strongest and weakest motivational construct, as well as, identify their responses of most preferred leadership behavior.

Discussion of the Results

The results of the study were collected from a population sample of homeowners at two public institutions in the Piedmont-Triad region of North Carolina. Each institution, ATA (a Historically Black College or University) and UGS (a Predominantly White Institution), were administered a questionnaire comprised of demographic, preferred leadership behavior and factors of motivation items. The combined sample size of 139 consisted of 25% from ATA and 75% from UGS. Of the 32% male and 68% female frequency of the sample, the primary ethnicity groups were African-Americans and Caucasians, with frequencies of 23% and 74%, respectively. As for education, income and age range of the sample, 73% possessed graduate or

professional degrees, 55% reported total household within $70,000 - $99,999, and 44% of the sample were within 51-60 years of age. With careful analysis, the research utilized the demographic data to accentuate the explanation of each research question, and pinpoint juxtapositions within the sample.

Research Question 1. The first research question sought to identify which motivational construct most influences a homeowner's ultimate decision to use renewable energy in his or her home. Based on the design of each set of instrument questions related to either *valence*, *expectancy*, or *instrumentality*, the study was able to elaborate not only which age group or income is more motivated, but also which construct of their motivational process had the most influence. For example, the sample of 139 homeowners revealed that they are most willing to use renewable energy in their home when an outcome of value is accomplished; this refers to Victor Vroom's *valence* construct. Figure 2 provides a graphical illustration of the most influential motivational construct for the sample.

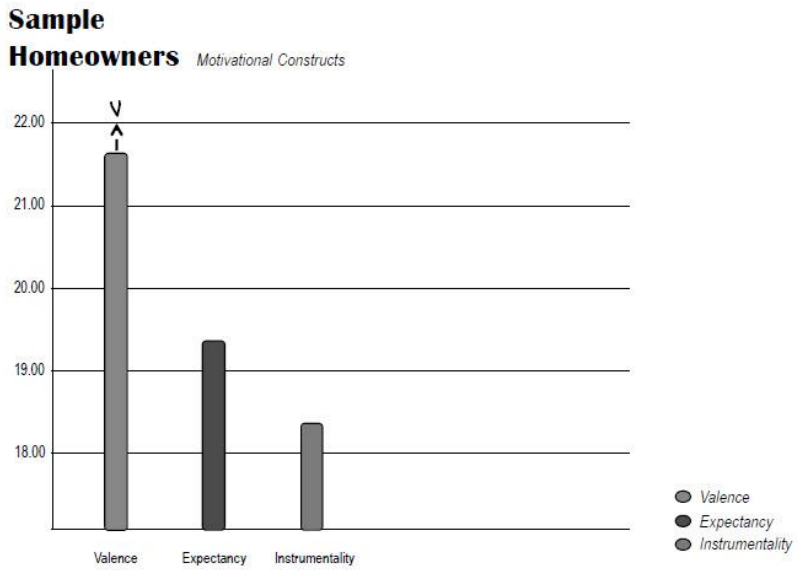

Figure 2. Most Influential Motivational Construct of the Sample

To help put this in perspective, the analysis also computed the sample's opinion about the other two motivational constructs. The results found the sample to believe that the sacrifices related to renewable energy use at home—such as closing thermo-shutters at night to prevent heat loss during the winter or only using specific paints and materials—would accomplish their desired outcomes of lowering utility bills or increasing their home's market value (*instrumentality*), but the majority of the sample also responded as unwilling to truly commit to these types of daily activities required for operating a renewable energy home (*expectancy*).

So overall, the data shows that in the decision making process on whether or not to use renewable energy in their home, homeowners care most about getting something of value out of their effort, but are not willing to commit to the unconventional sacrifices that will reach their valued outcome, even though they do believe those unconventional sacrifices would actually produce their previously stated valued outcome. Moreover, in regards to renewable energy integration, the majority of surveyed Piedmont Triad homeowners are attracted to outcomes such as a lower monthly utility bill, or an increase to their home's market value, but they are attracted least to tasks like limiting water usage in the evening or sleeping directly on a waterbed to conduct heat away from the body during warm summer nights—in spite of the sample believing that such abnormalities would probably work.

The results of research question number one offer a distinctive addition to previous research concerning motivational processes and decision making. As earlier studies have found, an individual often makes decisions based upon a single or particular set of motivations. Such motivations range from basic intrinsic needs, suggested by Maslow, or as Etzioni posits, an individual's decision can be purely motivated by the strength of their moral imperative or social exchange processes (Maslow, 1954; Etzioni, 1975). Indeed, the Piedmont-Triad homeowner

survey results echo many of the notions found in prior studies, however, the conditions for which the individual (i.e., homeowners) was motivated contrast with any of the previous studies. For example, after a thorough review of the literature, previous motivational studies were found to center from the context of decisions made within a business or organization. Therefore individual's decisions were not only considering motivational factors in their work life, but may have also calculated how those decisions (business or organization) would inevitably impact their home and personal life. In contrast, and as a first, this study assesses motivation's influence on decisions solely from the context within an individual's home, thusly excluding factors that may be related to an individual's professional work life. As the findings within this study suggest, Piedmont-Triad homeowner's decision to integrate renewable energy applications within the home indicates that an outcome of value (valence) is the strongest motivational influence.

Research Question 2. The second research question asked which of Robert House's leadership behaviors were preferred most by the homeowners. The study instrument asked if they prefer a leader who gives (a) explicit instructions or task lists—*directive*; (b) a leader who acts more as a supportive figure to whatever the non-leader prioritizes—*supportive*; or (c) a leader who chooses to ask a non-leader for their input before making a final decision—*participative*. Most Piedmont-Triad homeowners prefer leaders who are *supportive* to the non-leader's goals, activities, or opinions. Figure 3 provides a graphical illustration of the overall preferred leadership behavior of the sample.

This particular behavior of leadership was far and away the most preferred, whereas a *participative* leadership behavior was slightly more preferred than a leader with a *directive* behavior. Interestingly, when compared to the sample as a whole, preference of leadership

behavior showed much more variation when demographic groups were contrasted (which will be discussed further in the fourth and final research question). Where the results of research question number two differ from Robert House's work and previous studies is that it may identify what homeowners innately prefer before a leadership behavior is even questioned as a preference. Moreover, the homeowners may have pre-developed an inherent preference, and the demographic results of this study show that the preferred leadership behavior easily differs within level of age, income, education and race. The literature review was unable to find previous studies that distinguish these characteristics in the context of non-leader preferences, especially, in regard to a sample of potential renewable energy homeowners. What this research question has serendipitously brought to the forefront, is that non-leaders, or Piedmont-Triad homeowners of the ethnic minority, prefer the directive leadership behavior. In contrast, Piedmont-Triad homeowners with household income levels above $130,000 do not prefer leaders who assign direct tasks (directive); they would prefer a leader that supports whatever they may individually prioritize (supportive).

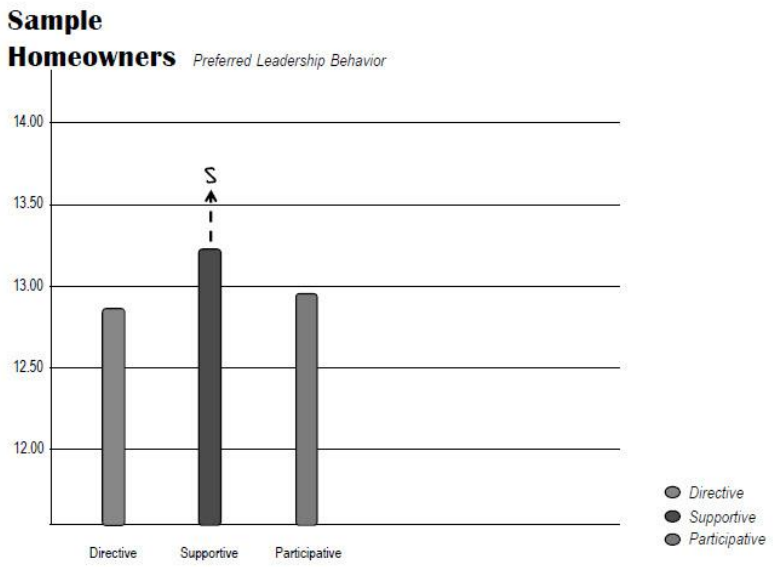

Figure 3. Most Preferred Leadership Behavior of the Sample

As such, what research question two effectively lends to the literature, and possibly for future research, is should preferred leadership assessments be conducted with a strict delineation between demographics (e.g., income, age, etc.). In other words, would an assessment of which leadership behavior is preferred be more accurately measured strictly within a specific age group, or within an ethnicity or income level, rather than by an entire sample? The results of research question two have exposed a potential gap in the metric logic within existing literature, and argue such findings as noteworthy.

Research Question 3. The third research question aimed to determine if any correlations existed between the leadership behaviors and motivational constructs. Based on the results of this study, the strongest relationship was between the supportive leadership behavior and the valence motivational construct. The second strongest relationship was between the directive leadership behavior and the expectancy motivational construct. The weakest of correlation was between the supportive leadership behavior and the instrumentality motivational construct. Each of these correlations were found as statistically significant.

Due to the lack or non-existence of previous studies that correlate preferred leadership behavior and motivation, the aforementioned correlations offer a few important aspects to existing literature. By identifying that homeowners who are influenced by valence also prefer a supportive leadership behavior, better techniques and strategies for renewable energy integration can be developed. The findings not only establish a set of uniquely measured correlations within the field of renewable energy, they also offer to the literature, in a general sense, a beginning mechanism to determine which type of leadership behavior may best suit or correlate with specific motivational constructs within the decision making process. For instance, the strongest correlation, valence to supportive, might mean that leaders within the field of renewables should

re-evaluate their approach to promoting renewable energy use within the home by emphasizing the benefits of this alternative home configuration—ideas such as lowering utilities or increasing home value. Along with this now empirically supported initiative, leaders should also design integrations with a supportive facilitation behavior. For example, those homeowners whom strongly perceive increased home market value as motivation would be invited to informational workshops with current sustainable homeowners to discuss certain advantages; or homeowners would be mailed informational maps of market trends related to sustainable homes and construction. The list of possibilities is endless, particularly if the integration strategy is based upon outcomes and behaviors that are found to have a significant relationship.

The previous three research questions, although important to this study, offer only a synopsis of the sample. But if leadership desired to use these results as a strategic tool for varying segments of homeowners who would potential affect renewable energy integration, the final research question would be of interest.

Research Question 4. This fourth and final research question fully utilized the previous three questions by depicting the motivation, preference of leadership behavior, and existing correlations from a socioeconomic perspective. Wherein, the results provide explanation for the sample by gender, ethnicity, age, education level, total household income, and institution. For example, if a set of questions were posited for each demographic, such as: which motivational construct—*valence*, *expectancy*, or *instrumentality*—holds the greatest influence to 46 year old homeowners in the Piedmont-Triad region of North Carolina? Or secondly, which leadership behavior do they prefer—*directive, supportive, or participative*?

According to the study results, the motivational process of homeowners between the ages of 40-50 were most influenced by the *valence* construct (i.e., in order to integrate renewable

energy within their home, they respond most positively toward valued outcomes, such as lower utilities, etc.). Figure 4 provides a graphical illustration of the motivational constructs for each age group within the sample of homeowners.

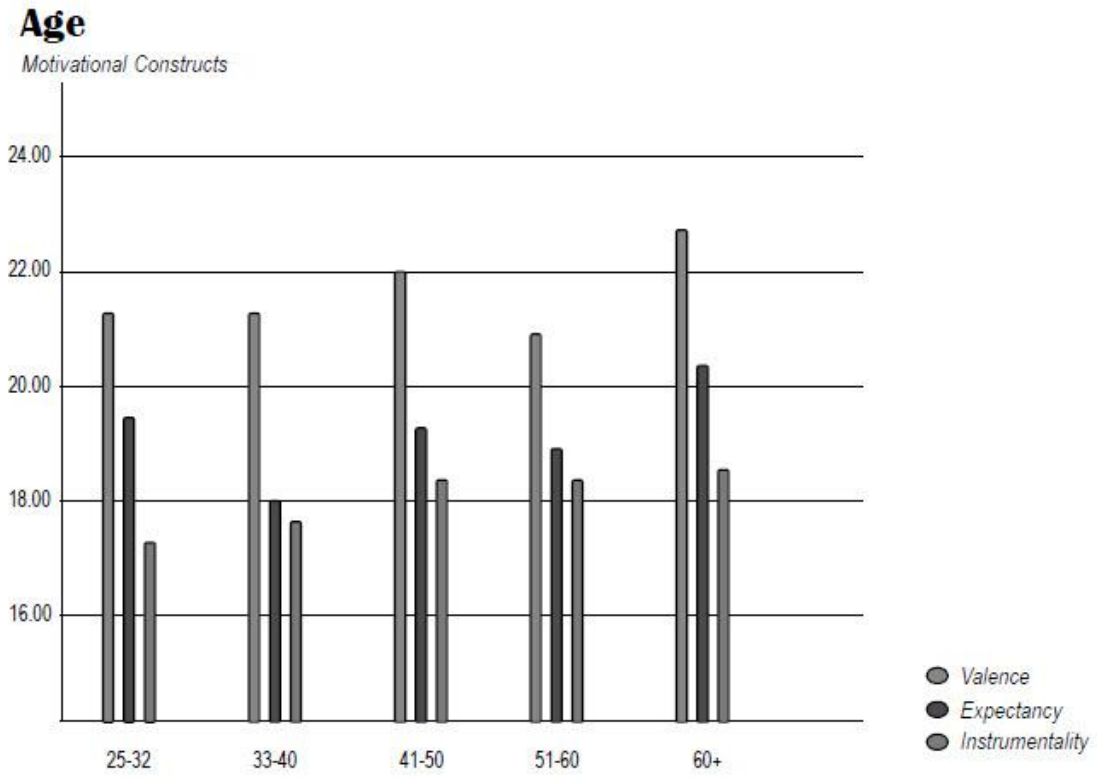

Figure 4. Motivational Constructs by Age Groups

Additionally, the 40-50 age range responded that they prefer a leader with a *supportive* leadership behavior. Both theoretical measurements for the 40-50 year old range—motivation and leadership behavior—mimic the overall results for the age group; unlike the 51-60+ range who also were motivated by *valence*, but most prefer leaders with a *participative* behavior of leadership. Moreover, when it comes to adopting renewable energy use in the Piedmont Triad, the decision process for sample homeowners between 40-50 years of age shows more positive emphasis around the valued outcome.

Indeed, the results reveal that *valence* proves to be the most positively perceived motivational construct for each of the queried age ranges, as well as, for all subsets within each demographic. However, the age grouping was the only to predominantly prefer a *supportive* leadership behavior – 4 out of the 5 age ranges. Figure 5 provides a graphical illustration of the preferred leadership behaviors for each age group within the sample of homeowners.

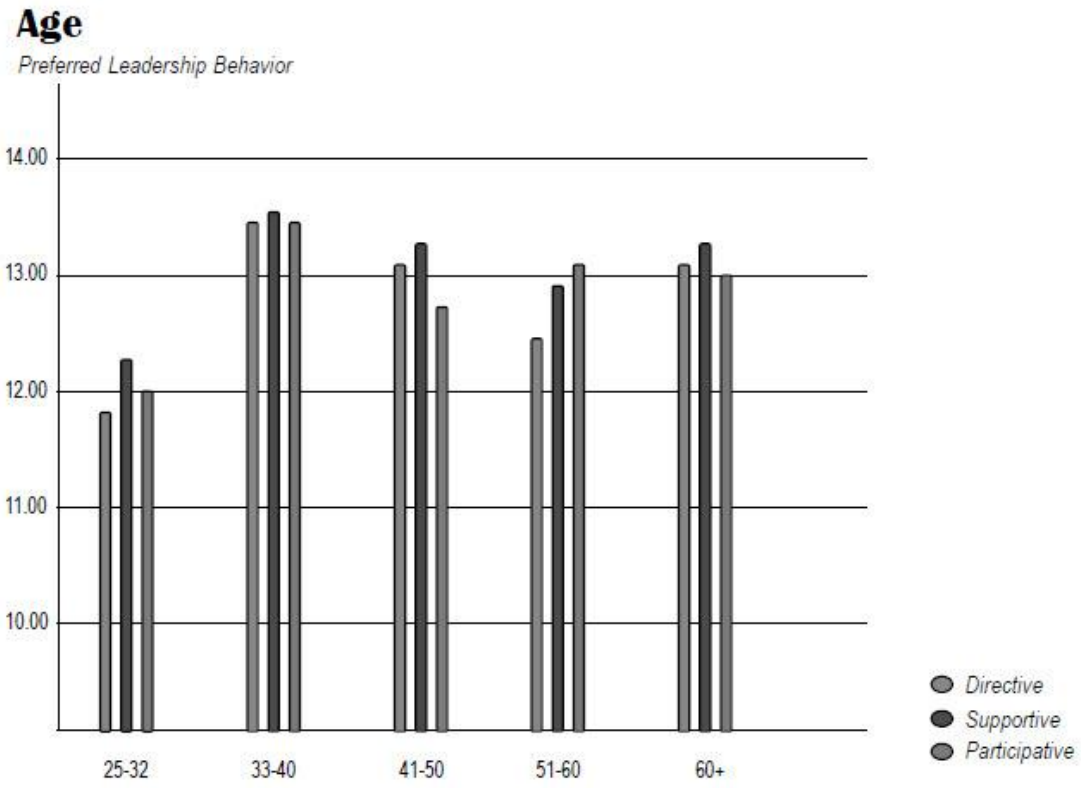

Figure 5. Preferred Leadership Behavior by Age Groups

However, when filtered by gender, ethnicity, education level, total household income, and institution, the data analysis found much more contrasting motivational construct and preference of leadership behavior results.

The gender demographic found that both male and female study participants prefer the supportive leadership behavior, as well as the valence motivational construct. As for the education level within the sample, participants with some college or community college level of

education prefer the directive leadership behavior; while all other education levels prefer supportive. In addition, each of the education ranges was most positive toward the valence motivational construct.

When the results were analyzed by ethnicity, both the *majority* and *minority* sub-groups were most positive toward the *valence* motivational construct, with the *majority* sub-group having a slightly higher level of positivity. When it came to preferred leadership behavior, they differed. The results found the *majority* to prefer leaders who exhibit a *supportive* leadership behavior, while the *minority* preferred leaders who exhibit a *directive* behavior of leadership.

Household income returned a diverse preference of leadership behavior. While each of the income sub-groups feel more positive toward the *valence* motivational construct, household incomes of less than $39,000 or greater than $130,000 prefer leaders who exhibit a *directive* leadership behavior. In contrast, the middle income ranges, between $70,000 and $129,000, prefer a *supportive* leadership behavior; leaving the $40,000-$69,000 range as the only income sub-group that prefers a *participatory* leadership behavior.

The last remaining demographic results are of the sample when filtered by institution. The results show that both ATA and UGS responded more positive toward the *valence* motivational construct, with UGS's positivity level slightly above ATA. In regard to preferred leadership behavior, ATA prefers a *directive* behavior, while UGS prefers a *supportive* behavior.

This study was unable to compare these findings with prior research due to a non-existence, or lack thereof that discussed preferred leadership behavior and motivational influences, or their correlations relative to demographic. Therefore, the findings may fortunately fill a gap in the literature in this regard, as well as offer a telling perspective on how particular

demographics prefer certain leadership behaviors; and how motivational constructs by demographic vary for renewable energy use within the home.

Summary. By quantitatively measuring the opinions of sample homeowners in the Piedmont-Triad region of North Carolina, the study has set the stage for an even more informative narrative. Because of such statistical analysis, the study has drawn results which identify motivations and leadership preferences for a multitude of demographics. Ultimately, the research indicates that sample homeowners with potential to adopt renewable energy within their homes are motivated the most when they can realize a return, or valued outcome from their effort of integration. However, when it comes to the daily routine of operating a renewable home, the sample seemingly appeared completely unmotivated. When the study further explores the results, it finds the sample to prefer *supportive* leadership behavior; this being particularly true for households with incomes between $70,000-$129,000, anyone outside the age of 51-60, and the UGS institution.

If the study were simply asked which of the groups or sub-groups are most motivated when it comes to integrating renewable energy within their home, the results, when calculated by Vroom's formula of motivational force (MF = Valence x Expectancy x Valence), find that sample participants over the age of 60 are more motivated than any other age range; the sample's *Minority* ethnicities are more motivated than the *Majority*; household incomes above $160,000 are the least motivated, and UGS has a higher motivational force than ATA. This synopsis of the results provides the most motivated sub-group for each demographic, as well as their respective strongest motivational construct and correlating preferred leadership behavior (see Table 48).

Table 48

Most Motivated Demographic Subgroups and their Preferred Leadership Behavior

Demographic	Most Motivated Sub-Group	Strongest Motivational Construct	Preferred Leadership Behavior
Gender	Female	Valence	Supportive
Ethnicity	Black	Valence	Directive
Age	60+	Valence	Directive
Education	Community College	Valence	Supportive
Income	$10,000-$39,000	Valence	Directive
Institution	UGS	Valence	Supportive

The composite variables (*valence, expectancy,* and *instrumentality*) were necessary for computing motivational force, just as the composite variables for measuring the sample's preference of leadership behavior (*directive, supportive,* and *participative*), but the greater purpose for both is their ability to now help align where leadership may need to focus resources, strategy, and education for renewable energy integration.

The study findings provide many elements of clarity for the previously discussed literature relevant to social acceptance, social promotion and public opinion within renewable energy integration. As the results indicate, the sample's level of social acceptance relies heavily upon their desire for an outcome of value, such as lowered household utility expenses. Where much of the literature review related to social acceptance considers the energy consumer perspective, this study now has empirical data that also reports low motivators for renewable integration, and can utilize this information for more effective social promotion. In addition, due to this study's instrument feedback, leaders in renewable energy now have a current and fundamental snapshot of the Piedmont Triad's public opinion on relative issues, such as their specific apprehensions for renewable living.

In summary, the findings within each of the research questions were predominantly different than previous studies related to leadership behavior, as well as motivation, due primarily to the fact that the literature review was unable to find previous studies with a similar conceptual or theoretical framework. But this study was unique, in part, because it assessed an individual's preferred leadership behavior and motivational influences based largely on decision outcomes realized within the home, opposed to decision outcomes that were originated from an external environment (e.g., work or professional organization).

Practical Implications

Mentioned early in Chapter 1, the formative intent of this study was to offer a potential solution for America's over dependence on fossil fuel. This study posited to allow an energy consumer, specifically homeowners, to share their most influential motivation, as well as their preferred behavior of leadership to help guide the solution process. Leaders in the academic or professional field of renewable energy now have access to demographic data which indicates homeowners who are highly motivated to integrate renewable energy use within the home, are now also aware of what they are motivated by (e.g. valence, expectancy, instrumentality). However, from a pragmatic viewpoint, where leaders may operate as problem solvers, should recognize that the highly motivated should not actually be the focus of the sample's role for renewable energy integration, or America's path toward energy independence.

The instrument utilized for the study tacitly sought to more purposely identify those who are least motivated, and what construct of their motivation or decision making process had the weakest response. So as academic leaders in the field conduct further research, or as practitioners in the field facilitate training, promotion, etc., the content and context of this study may now offer a chance of better implementation accuracy. In other words, the scholar and practitioner can

now aim their strategies and techniques differently, with more consideration of the least motivated for renewable integration, such as the 33-40 age range, or the households with total incomes above $160,000. This level of detailed analysis provides the least motivated sub-group for each demographic, as well as their respective weakest motivational construct and correlating preferred leadership behavior (see Table 49).

Table 49

Least Motivated Demographic Subgroups and their Preferred Leadership Behavior

Demographic	Least Motivated Sub-Group	Weakest Motivational Construct	Preferred Leadership Behavior
Gender	Male	Instrumentality	Supportive
Ethnicity	White	Instrumentality	Directive
Age	33-40	Instrumentality	Directive
Education	Graduate	Instrumentality	Supportive and Participative
Income	$160,000+	Instrumentality	Directive
Institution	ATA	Expectancy	Directive

This study offers data and analysis for leaders within the renewables arena (private or public industry) an opportunity to know that sample homeowners in the Piedmont-Triad want an outcome of value from their effort to adopt a renewable energy home life, and believe their efforts would actually work. But unfortunately, every demographic (age range, ethnicity, income, institution, etc.) become unmotivated when they have to consider performing some of the unconventional tasks.

The challenge for America's leaders, at least in the Piedmont-Triad of North Carolina, is not valence (valued outcome) or instrumentality (worthiness of effort), it is predominantly expectancy (performance required to achieve the value). The results of this study provide only a

basis for leadership. The ability to implement change as a solution—based on these results—will require strategies that are creative, consistent, and uncomplicated.

Implications for Leadership

As the results of the study have presented, the profile of an energy consumer (e.g., a homeowner) has been quantified by varying measures of motivation. Effectively, each motivational construct has been interpreted to truly measure a focus area for academic and professional leadership to use as strategy for energy independence. To that end, the study's inherent questions have evolved from what motivates energy consuming homeowners, to how can leadership influence those homeowners who are unmotivated to consider renewable energy use within their home?

To address this dilemma, the research conducted throughout this study has drawn a few fundamental arguments. First, leadership should re-evaluate the effectiveness of strategies and techniques used for energy consumer education. Proper training, promotion, and basic explanation should be woven into agendas as a core facet. This study perceives that by thoroughly educating the public about the operations and benefits of renewable living, hidden apprehensions may be relaxed.

During the early stages of research, beginning in September of 2008, a number of local and regional functions were attended by the principal investigator for observation. The functions, directly related to renewable energy concepts and applications, were facilitated by organizations such as North Carolina Sustainable Energy Association, Guilford Energy Resources, and U.S. Green Building Council. The results of the observations found a total absence of any (faculty, staff, and student) representation from either of the institutions (ATA and UGS) used within the study sample. By itself, this secondary research conducted outside of the program of study is

telling, particularly when juxtaposed with the study findings, as well as considering what this study argues as a cornerstone to increase renewable integration: educating the energy consumer.

The primary message from the principal investigator's field notes strongly implies how participation by community organizations, like universities, is vital. Universities have the opportunity to learn from the community itself, and in turn, take their tools of research and academic perspective to the community. Imagine if students and professors from ATA's Energy and Environmental Science department attended the Cooperative Extension Program event back on April 11th, 2009—the likely opportunity for internal and external community engagement for all those in attendance would have been immense. The event could have been an opportunity for the academic institution to share research findings about the temperature effects of passive solar living versus active solar living. Or for a community member who lives in a solar home, they could have shared with the academic institution their real-time sample of utility savings over a period of months or years. The results from such an exchange can breed data and perspective for the masses, or rather, to potentially unmotivated homeowners like those found in this study, whom may be discouraged or simply cannot see the feasibility of living in a renewable energy home. Although just a single example, it promotes the power of educational institutions becoming more involved within the community, and the potential power of a community to better embrace change when methodically exposed to unconventional concepts and information. This perspective of alternative techniques to save money and resources can be used by local organizations and groups that work directly with distressed or low income communities for capacity building. By conversing on subjects such as living in a sustainable home, related topics in business, finance, strategy, etc. are afforded a unique example to use as a platform for discussion.

Recommendations for Future Research

This study suggests several recommendations for future research. Due to a lack of comparable studies with a similar theoretical framework, the recommendations are primarily based upon the data analysis and results found within this study. The first recommendation suggests that the study be repeated. Because the results for the sample may in fact not be true of other samples, and more importantly, may not be generalizable to the population, the study should be replicated to validate the findings. The second recommendation suggests an increase in sample size, as well as, utilization of a more diverse sample. With a larger sample, conclusions may be drawn that better illustrate minority representation, age groups, and education level. The third recommendation would suggest targeting institutions of higher education that possess very similar characteristics, such as employee and student diversity. Fourth, the study recommends querying a sample of leaders from either an educational university or private industry. An interesting contrast may be found if a study were aimed to examine what leaders assume homeowners are probably motivated by and what behavior of leadership they prefer. Fifth, the study suggests applying an instrument to gather responses from age groups 25 and younger.

Focusing on those ages may provide a snapshot of where the mindset and motivational state of future energy consumers and homeowners trend. And lastly, the study suggests adding a qualitative component to the methodology, thereby offering an opportunity for richer data, or serendipitous findings.

Limitations of the Study

In its entirety, this study contributes to literature and further research as it relates to renewable energy and the general rubric of leadership. In spite of this, there are limitations of the study which should be discussed. The first limitation concerns the disproportion in ethnicity

representation. As illustrated in Table 8, the minimal level of sample diversity may impede the generalizability of the results to the population. Secondly, a more extended duration of data collection may have increased the sample size, thusly increasing the chance of generalizing the sample results to the population of homeowners. Third, if the sample participants had an opportunity to also elaborate their questionnaire responses via an open-ended instrument item, the data analysis and results may have proven different, providing contrasting explanations of the study research questions. Fourth, if the study were not limited to the southeast region of the United States, specifically, North Carolina, varying descriptive data may have resulted if sample was selected from populations with contrasting demographics data. Lastly, there is a limitation to this study due to its one of kind theoretical framework and instrument design. There is a possibility of more reliable results if there were samples of identical instrumentation available based on previous research within the field of renewable energy research.

Despite these limitations, this study provided valuable information about renewable energy integration in the Piedmont Triad of North Carolina. This study offered an understanding of what is important to homeowners whom consume energy and the behaviors of leadership that may lead to the increased use of renewable energy within the home.

Conclusion

The original premise for this study was to examine the role of leadership. But before this objective could properly begin, the principal investigator underwent a full circle analysis that started by simply asking why leadership is important, and the explanation to that question ultimately discovered much of what is contained within this concluding section and doctoral study. Used as a vehicle of exploration for the concept of leadership, the integration of renewable energy as a supplemental solution for American fossil fuel independence was chosen as the

learning module. By applying the theory of leadership to an actual problem, the research process entailed a comprehensive and connective viewpoint.

This dissertation process discovered leadership and renewable energy as tools, and along the way, found both to affect global economics, international relations, domestic policy, military positioning, and social normalcy versus social chaos. Because of this vast array of context, the principal investigator sought to derive the most relevant and accurate solution possible for the problem stated in this dissertation. And after a span of four years, and over 2900 hours spent outside of the classroom for either research, observation, conferences, workshops, etc. (see Appendix F), identifying the core motivations and preferred leadership behaviors was chosen as the most fundamental and beneficial assessment to revitalize a decades long challenge of engaging the energy consumer to embrace a pathway of independence from fossil fuel.

The research found within this study concludes that in order to increase energy independence, and for alternative energy solutions to find traction, all those who consume energy must operate as a leader. To achieve this reality, domestically and internationally, leaders must strategically motivate energy consumers to embrace their personal role as a pivotal leader in renewable energy integration.

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Appendix A

NC A&T IRB Approval Letter

NC A&T DIVISION OF RESEARCH AND ECONOMIC DEVELOPMENT
1601 East Market Street
Greensboro, NC 27411
(336) 334-7314
Web site: http://www.ncat.edu/~divofres/compliance/irb/index.php
Federalwide Assurance (FWA) #00000013

To: Casey Forrest

From: Behavioral IRB

Authorized signature on behalf of IRB

Approval Date: 7/13/2011
Expiration Date of Approval: 7/11/2012

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Submission Type: Initial
Expedited Category:
Study #: 11-0099

Study Title: Renewable Energy Integration: Correlating Homeowner Motivations for Residential Applications and Preferred Leadership Behaviors

This submission has been approved by the above IRB for the period indicated. It has been determined that the risk involved in this research is no more than minimal.

Study Description:

The purpose of this quantitative, correlational study is to explain the relationship between homeowners' preferred leadership style and their motivation to use sustainable energy.

Investigator's Responsibilities:

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

When applicable, enclosed are stamped copies of approved consent documents and other recruitment materials. You must copy the stamped consent forms for use with subjects unless you have approval to do otherwise.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented (use the modification form at ohre.unc.edu/forms). Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB using the adverse event form at the same web site. **If you are conducting research in a public school, you must provide written approval of the superintendent's office prior to conducting your research.**

This study was reviewed in accordance with federal regulations governing human subjects research, including those found at 45 CFR 46 (Common Rule), 45 CFR 164 (HIPAA), 21 CFR 50 & 56 (FDA), and 40 CFR 26 (EPA), where applicable.

Appendix B

UNCG IRB Approval Letter

THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

Office of Research Compliance

2718 Beverly Cooper Moore and Irene Mitchell Moore
Humanities and Research Administration Building
P. O. Box 26170, Greensboro, NC 27402-6170
336.256.1482 *Phone* 336.256.1482 *Fax*
www.uncg.edu/orc/

To: Casey Forest
4035 Lenora Drive
Winston-Salem, NC 27107

August 31, 2011

Dear Mr. Forest:

The IRB for the Protection of Human Participants in Research at The University of North Carolina at Greensboro (UNCG) is willing to accept the approval of project entitled "Renewable Energy Integration: Correlating Homeowner Motivations for Residential Applications and Preferred Leadership Behaviors" through NC A&T University. Access to participants on this campus must be cleared through the appropriate department prior to you collecting data on the UNCG campus.

If you have any questions, please contact me at ecallen@uncg.edu or (336) 256-1482.

Sincerely,

Eric Allen, Director
Office of Research Compliance

Cc: Dr. Martha Nyikos, Literacy, Culture & Language Education

Appendix C

LMI Questionnaire

RE Integration - Leadership Studies

Demographics

The purpose of the following Demographics section is to help group research participant data.

***1. Please indicate your gender?**

- ☐ Male
- ☐ Female

***2. Please indicate your race/ethnicity?**

- ☐ Hispanic, Latino, or Spanish
- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Other Pacific Islander

***3. Please indicate your age?**

- ☐ Less than 25
- ☐ 25-32
- ☐ 33-40
- ☐ 41-50
- ☐ 51-60
- ☐ 60+

***4. Please indicate your highest completed level of education?**

- ☐ Completed High School
- ☐ Some College
- ☐ Community College
- ☐ College (BS, BA)
- ☐ Graduate/Professional Degree

***5. Please indicate your total household income?**

- ☐ $10,000 to $39,999
- ☐ $40,000 to $69,999
- ☐ $70,000 to $99,999
- ☐ $100,000 to $129,999
- ☐ $130,000 to $159,999
- ☐ $160,000+

RE Integration - Leadership Studies

***6. Please indicate your residential status?**

- [ ] Homeowner
- [ ] Rent/Lease

***7. Please indicate your current institution of employment?**

- [ ] North Carolina A&T State University
- [ ] University of North Carolina at Greensboro

RE Integration - Leadership Studies

Leadership Behaviors

The purpose of the following Leadership Behaviors section is to identify participant preferences for a particular leadership style or behavior.

*** 8. Please give your opinion on the following statements concerning leader behavior.**

	Never	Seldom	Sometimes	Often	Always
1) I prefer a leader who gives clear explanations of their expectations of me	◯	◯	◯	◯	◯
2) I prefer a leader who shows interest in my personal well-being	◯	◯	◯	◯	◯
3) I prefer a leader who invites me to participate in decision making	◯	◯	◯	◯	◯
4) I prefer a leader who gives explicit instructions regarding tasks	◯	◯	◯	◯	◯
5) I prefer a leader who shows interest in my personal and professional development	◯	◯	◯	◯	◯
6) I prefer a leader who solicits suggestions from myself and others before making a decision	◯	◯	◯	◯	◯
7) I prefer a leader who gives clear directions regarding projects	◯	◯	◯	◯	◯
8) I prefer a leader who listens to others, and provides encouragement	◯	◯	◯	◯	◯
9) I prefer a leader who is receptive to ideas from myself and others	◯	◯	◯	◯	◯

RE Integration - Leadership Studies

Renewable Energy Motivational Factors

The purpose of the following Renewable Energy Motivational Factors section is to collect opinions about what would motivate participants to use renewable energy within their home.

***9. Please give your opinion by rating how attractive each of the following incentives are toward your willingness to use Renewable Energy applications within your home - for example, using rooftop solar panels.**

	Highly Unattractive -3	-2	-1	0	+1	+2	Highly Attractive +3
Help reduce global warming and carbon pollution	◯	◯	◯	◯	◯	◯	◯
Help stimulate state and local economies for job growth	◯	◯	◯	◯	◯	◯	◯
Increase your amount of available Tax Credits/Deductions	◯	◯	◯	◯	◯	◯	◯
Increase your home's market value	◯	◯	◯	◯	◯	◯	◯
Lower your monthly utility bill	◯	◯	◯	◯	◯	◯	◯

***10. Please give your opinion by rating your likelihood to perform the following tasks associated with Renewable Energy integration within your home.**

	Very Unlikely	Unlikely	Neither Likely or Unlikely	Likely	Very Likely
Conduct monthly expense and energy use analysis in order to monitor renewable energy efficiency	◯	◯	◯	◯	◯
Consistently close all window thermo-shutters at night as a heat loss prevention technique during the winter	◯	◯	◯	◯	◯
Consistently open and close windows throughout the day to maximize peak ventilation and home cooling during the summer	◯	◯	◯	◯	◯
Sleep directly on a water bed as a cooling technique, allowing the water bladder to conduct heat away from your body during warm nights	◯	◯	◯	◯	◯
Use less hot water after the sun goes down to ensure the use of solar heated water opposed to conventional electric heated water	◯	◯	◯	◯	◯
Use only specific paints and materials on the roof and walls of your home as a technique to properly reflect or absorb sunlight	◯	◯	◯	◯	◯

RE Integration - Leadership Studies

***11. Please give your opinion by rating your belief that by performing any of the tasks in the previous question Q10, you can achieve the following outcomes:**

	Disbelieve Strongly	Disbelieve	Neither Believe or Disbelieve	Believe	Believe Strongly
Help Reduce Global Warming and Carbon Pollution	◯	◯	◯	◯	◯
Help Stimulate state and local economies for job growth	◯	◯	◯	◯	◯
Increase Amount of available Tax Credits/Deductions	◯	◯	◯	◯	◯
Increase Your Home's Market Value	◯	◯	◯	◯	◯
Lower Your Monthly Utility Bill	◯	◯	◯	◯	◯

Appendix D

Cover Letter to Participants

Study Title: Renewable Energy Integration: Correlating Homeowner Motivations and Preferred Leadership Behaviors

PI: Casey J. Forrest

Dear Colleague,

I am inviting you to participate in a research project to study homeowner motivations for renewable energy use in the Piedmont Triad region of North Carolina. This research project is funded by Casey J. Forrest, a doctoral candidate at North Carolina A&T State University. At the bottom of this letter is a web link to a short questionnaire that asks a variety of questions about motivations toward renewable energy use and preferred types of leadership behavior. I am asking you to look over the questionnaire and, if you choose to do so, complete it and submit your responses back to me. It should take you about 15 minutes to complete. You must be 18 years of age to participate.

The results of this project will be used to help guide scholars and practitioners toward effective renewable energy approaches in North Carolina. Through your participation I hope to understand how renewable energy can benefit homeowners. I hope that the results of the survey will be useful for academic and professional development, and I hope to share my results by publishing them in a scientific journal.

I do not know of any risks to you if you decide to participate in this survey and I guarantee that your responses will not be identified with you personally and will be maintained in confidence. I promise not to share any information that identifies you with anyone outside my research group which consists of me and the four members of my dissertation committee. You should not put your name on the questionnaire.

I hope you will take the time to complete this questionnaire. Your participation is voluntary and there is no penalty if you do not participate. Regardless of whether you choose to participate, please let me know if you would like a summary of my findings. If you would like a summary of the results, please feel free to contact me at (336) 420-7287.

If you have any questions or concerns about completing the questionnaire or about being in this study, you may contact me at (336) 420-7287 . This project has been approved by the Institutional Review Board (IRB) at North Carolina A&T State University. If you have any questions about your rights as a research study participant, you may contact the chair of the IRB Compliance Office at (336) 334-7995 or rescomp@ncat.edu.

You must be at least 18 years old in order to participate. By completing the online survey, you are giving your consent to participate in my study. After beginning the survey, you may withdraw from completing it at any time. You do not have to put your name on the survey. Your cooperation and participation in the study is greatly appreciated.

Proceed to survey: https://www.surveymonkey.com/s/KDMN7VB

Sincerely,
Casey J. Forrest

Appendix E

Follow-up Letter to Participants

Dear Colleague,

Due to a low response rate, I just wanted to follow-up a previously sent request for all NCAT faculty and staff to participate in a research project for a doctoral candidate at North Carolina A&T State University. Below you will find a cover letter which describes my study and the details of my request for your help with my dissertation process. I want to first sincerely thank those who have already taken the time to complete the survey. For those who have already received a request, but have not had a chance to click on the questionnaire link at the bottom of the cover letter, please take a few minutes to complete the survey. For those of you who have not received the original request, I ask that you also please review the cover letter and complete the questionnaire by clicking the link at the bottom of this email. Because of time constraints for my data collection, I ask that everyone please complete the survey by January 25, 2012. Again, I thank all of you who are willing to offer your thoughts and opinions. If you have any questions about the research, surveys, or authenticity of this request, please feel free to contact me:

Casey J. Forrest
Employed at UNC School of the Arts—Email: caseyf@uncsa.edu; Office Phone: 336-770-1493; Mobile Phone: 336-420-7287
Student at NC A&T State University—Email: cjforres@ncat.edu

Appendix F

Hours Dedicated to Research and Study Outside of Classroom

North Carolina A&T State University
Leadership Studies Ph.D. Program

Monthly Total of Hours Dedicated to Research and Study Outside of Classroom

	2008	**2009**	**2010**	**2011**	**2012**
January	0	73	85	66	111
February	0	95	54	107	104
March	0	89	82	93	75
April	0	83	65	84	0
May	0	74	79	66	0
June	0	91	53	78	0
July	0	105	34	74	0
August	63	104	28	44	0
September	59	82	46	70	0
October	75	49	72	85	0
November	65	68	57	50	0
December	31	37	19	27	0
Total Hours (Per Year)	**293**	**950**	**674**	**844**	**290**