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## The Political Economy of Energy Based Green Economic Development: Policy Tools and Their Use for Local Energy Based Green Economic Development

Hyunsang Ha



**THE FLORIDA STATE UNIVERSITY**

**COLLEGE OF SOCIAL SCIENCES**

**THE POLITICAL ECONOMY OF ENERGY BASED GREEN ECONOMIC**

**DEVELOPMENT:**

**POLICY TOOLS AND THEIR USE FOR LOCAL ENERGY BASED**

**GREEN ECONOMIC DEVELOPMENT**

**By**

**HYUNSANG HA**

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The members of the committee approve the dissertation of Hyunsang Ha defended on June 10, 2011.

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Richard C. Feiock  
Professor Directing Dissertation

---

Timothy C. Chapin  
University of Representative

---

Frances S. Berry  
Committee Member

---

Keon-Hyung Lee  
Committee Member

Approved:

---

Earle Klay, Chair, Askew School of Public Administration and Policy

The Graduate School has verified and approved the above-named committee members.

Dedicated to My Father and Mother

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# ABSTRACT

Local economic development is in transition to “green economic development.” Local governments in the U.S. and other countries have adopted a variety of policy tools to promote green economic development and are applying them to their local economies. The success of these efforts may depend on whether local officials have a systematic understanding of green development and how it is different from more conventional economic development approaches. One purpose of this study is to enhance our understanding of green development policy by advancing a theoretical framework and identifying empirical evidence to account for local green economic development activities and policies. The most basic but essential task is to understand when and how policy tools are used.

The factors influencing conventional economic development activities and green economic development activities are drawn from three explanatory approaches in the literature on urban policy and economic development: the economic pressure model, the political/institutional choice model, and development/environmental coalition model. These explanatory models are adapted and extended to account for energy based green economic development policy including the promotion of energy efficient technology, promotion of renewable energy development, and regulatory relief targeted to energy efficiency and renewables.

This investigation produces several potentially important findings. First, local decision makers’ perceptions and motivations regarding the importance of green businesses and industries significantly influence the use of each of the four policy tools. Additionally, neighborhood and environmental protection organizations, which have not had much impact on conventional development, have a significant influence on green development policy. Also, a community’s standard of living and collaborative activities for green development are linked to regulatory relief for energy efficient technology development by local governments.

Some of the same factors that determine conventional economic development activities such as administrative capacity, economic stress, development competition, voters’ preference, and support of private organizations also influence the use of green economic development policy tools. An unanticipated finding is that Florida citizens registered as members of the Democratic or Green Party in Florida are less likely to support incentives and regulatory relief

for renewable energy development. This curious result may reflect factors unique to Florida or cleavages in environmental voting blocks over renewable energy. Certain renewable energy sources are controversial and are purported to generate energy sprawl and negative environmental externalities. In Florida, renewable energy policy may be associated with Republicans because incentives and regulatory relief have usually been favored tools of the Christ administration. Since 2006, the Republican Party in power has emphasized climate changes and promoted renewable energy development.

This study concludes that the development incentives for local green economic development are the product of political bargaining and collective action among stakeholders, rather than a product of economic pressures or conditions. This is in stark contrast with regulatory relief for green economic development. While regulatory relief for the use of energy efficient technology is significantly influenced by economic pressure and conditions, regulatory relief for renewable energy development is substantially influenced by political choice and stakeholders' activities.

Comparison of development incentives and regulatory relief also provides new insights. Incentives for energy efficient technology are influenced by political/institutional factors and stakeholders' power and roles. In contrast regulatory relief to promote energy efficient technology development is shaped more by community economic pressures and conditions. However, both incentives and regulatory relief for renewable energy development are influenced by political bargaining and the power of environmental advocacy coalitions. The conclusion urges local governments or decision makers to pay attention to the distinctions highlighted in this analysis in the design, adoption and implementation of policy tools for green economic development.

# CHAPTER 1

## INTRODUCTION

### 1.1 Research Inquiry

This study investigates what accounts for the use of local green economic development policy tools targeted to energy based green business and industry such as renewable energy and efficient energy use.<sup>1</sup> Economic growth often has produced environmental pollution, energy supply problems, and green gas emission. Nevertheless, economic growth and development will not be stopped. The challenge is not to limit economic development but to convert it into a form of development that is environmentally sustainable. Therefore, the tradeoffs and conflicts among economic growth and environmental protection and/or clean and sustainable energy need to be reconsidered as complementary and symbiotic.

Local governments have recognized the need for a paradigm change regarding economic development policies and activities. They have sought knowledge and expertise to create new economic development guidelines to traverse the transformation from conventional to emerging green economic development, employing a variety of policy tools for environmentally sustainable economic development. This transformation requires changes of incentives and regulatory strategies for economic development. Considering the transition from conventional economic development to local green economic development will more efficiently address a variety of factors influencing the use of policy tools for local green economic development.

The investigation of factors that influence the use of policy tools for energy based local green economic development distinguishes conventional and green economic development factors based on three models for green economic development: the economic pressure model, the political/institutional choice model, and the development/environmental coalition model. In addition, this study identifies the differences between two types of policy tools, development incentives and regulatory relief. This study also carries out a comparative analysis of the factors influencing these policy tools in terms of two economic perspectives that underpin the policy

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<sup>1</sup> Green business and industry are defined as enterprises which consider environmental protection as an essential component of their long-term business objectives, both by promoting eco-efficient production activities and by marketing sustainable products and services (ESCAP, 2009).

tools: neo-classical economic perspective and ecological economic perspective. These comparative analyses will contribute to expanding the limits of previous studies to provide a more advanced theoretical foundation for energy based local green economic development. It also suggests important implications of green economic development policy tools.

## **1.2 Transition from Conventional Economic Development to Green Economic Development**

This section categorizes the transition from conventional economic development to green economic development into four stages or waves. Although these waves overlap and sometimes involve the same characteristics, these categories capture distinct shifts in theory and practice that proceed with the current interest in green economic development.

**Wave 1: Business Attraction and Retention (1930s-1980s).** Conventional economic development focuses only on economic growth. Since economic efficiency and growth were emphasized, economic development policies considered economic costs and results as their primary concerns. The environment was recognized as an abundant source of economic development that could be dominated and exploited by humans, and environmental pollution was regarded as an unavoidable by-product of growth issues and curable by well-crafted policies. Therefore, local economic development policies did not reflect environmental costs (Byrne, et al., 1994), and economic development policies were isolated from other important environmental issues (Christensen, 1996).

Conventional local economic development strategies were usually dependent on attracting businesses to a jurisdiction or encouraging retention and expansion of existing businesses. Local governments took advantage of tax incentives, loan guarantees and direct loans, non-financial incentives such as training targeted to specific labor needs, and a host of other incentives targeted to individual firms. Local governments also made use of more indirect strategies and incentives such as business incubation, micro-enterprise development, venture capital forums and other types of capital provision, and various technical assistance efforts (Koven and Lyons, 2003). These policy tools were explained by two competing theories. The first perspective views local economic development as the result of intergovernmental competition to protect a community's fiscal base and economic position (Tiebout, 1956; Peterson,

1979; 1981). Local governments compete with one another in markets for both capital and tax-paying residents in order to achieve the most favorable benefit and tax ratio (Tiebout, 1956). In other words, since local economic prosperity is the basis for fiscal and political power to provide citizens with a reasonable quality of public services, local governments compete to attract and retain mobile businesses and wealth (Peterson, 1981; Swanstrom, 1985; Bowman, 1987).

The second perspective regards economic development as the product of activities performed by strategic self-serving interest groups (Molotch, 1976; Logan and Molotch, 1987). There has been a growing emphasis on interest groups' activities that Molotch (1976; 1987) and his associates describe as *an urban growth machine*. Business groups, neighborhood groups, and local elected officials exercise political power to influence local economic development decisions because they have an ample supply of information, and financial, technological, and organizational resources (Molotch, 1976; Logan and Molotch, 1987). The growth machine consists of elites able to exert power on local governments to pursue policies consistent with their own economic and political goals.

**Wave 2: Industrial Cluster and Agglomeration for Economic Efficiency (1960s-2000s).** Business attraction and retention strategies gave rise to unexpected social and environmental costs because local decision makers sometimes failed to proactively consider hidden or unanticipated problems. Careful planning for the unintended effects of industrial recruitment strategies was required to successfully mitigate these problems. In addition, efforts to cure problems due to continuing growth stimulated studies regarding citizens' influence demonstrated by neighborhood organizations and anti-growth coalitions. Therefore, development policies of the second wave began considering environmental and social problems. However, local economic development policies were concentrated on strategic development tools to maximize the economic efficiency of businesses. The second wave attempted to create an efficient economic activity environment that was most conducive to local economic development.

The most popular policy tools for local economic development were agglomeration and industrial clusters that emphasize public-private partnerships and networking, human-capital building, and strategic planning. Agglomeration arises from interdependencies across complementary economic activities that give rise to increasing returns (Delgado and Porter,

2010) and thus promotes functional collection of production activities. Agglomeration<sup>2</sup> is the “cumulative advantages accruing from the growth of industry itself such as the development of skill and know-how, the opportunities for easy communication of ideas and experience, the opportunity of ever-increasing differentiation of processes and of specialization in human activities” (Ihlanfeldt, 1995; 128). Industrial clusters are “geographic concentrations of firms, suppliers, support services, specialized infrastructure, producers of related products, and specialized institutions (e.g., training programs and business associations) that arise in particular fields in particular locations” (Portner, 2007). Therefore, industrial clusters are economic communities for efficient economic activities and permit a variety of interactions, including joint venturing, resource pooling, just-in-time inventorying, and other benefits (Portner, 2007; Kovan and Lyons, 2003). Accordingly, industrial clusters consist of dense networks of interrelated firms that arise in a region because of powerful externalities and spillovers across firms within a cluster. Because of the importance of proximity to cluster benefits, clusters normally arise at the level of regions or economic areas, rather than entire nations (Portner, 2007). These strategies promote partnership or regional governance approaches based on networks among interrelated firms, governments, and stakeholders.

However, agglomeration and industrial clusters exacerbated the jobs/housing imbalance between inner cities and suburbs, and between suburbs with many large employers and suburbs with no large employers. Many people in low-paying jobs could not afford to live near their places of work. In major metropolitan areas, even middle-income persons may have found themselves commuting for hours each day between affordable housing and places of employment. This situation gave rise to not only gridlock and air pollution from auto emissions but also lost family and civic time (Delgado and Porter, 2010; Kovan and Lyons, 2003). Therefore, higher income households move out from the inner city, and commercial and industrial employers follow them. As a result, while the tax base of the inner city declined, the central city population of the poor in need of social services increased. Realizing a variety of

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<sup>2</sup> Agglomeration is commonly divided into two types: localization and urbanization. Localization is production cost saving accruing to firms for locating close to other firms in the same, or a related, industry, that is, increasing returns to activities within a single industry. Urbanization occurs when the production costs of firms decline as the aggregate level of economic activity expands within an area, in other words, increasing returns to diversify at the overall regional level (Ihlanfeldt, 1995; Delgado and Porter, 2010)



problems resulting from continuing urban sprawl and economic growth, local governments sought a set of broad goals to counteract urban sprawl.

**Wave 3: Smart Growth (1990s-Present).** In the era, local economic development began emphasizing harmony and compatibility between economic growth policies and environmental protection (Campbell, 1996; Godschalk, 2004; Connelly, 2007; Kovan and Lyons, 2003). The smart growth perspective flourished as an alternative strategy to mitigate a variety of problems due to city growth and suburban sprawl.<sup>3</sup> The Smart Growth Network sponsored by the U.S. Environmental Protection Agency promotes 10 principles of smart growth (Koven and Lyons, 2003: 71).

Mix land uses

Take advantages of compact building design

Create a range of housing opportunities and choices

Create walkable neighborhoods

Foster distinctive, attractive communities with a strong sense of place

Preserve open space. Farmland, natural beauty, and critical environmental areas

Strengthen and direct development toward existing communities

Provide a variety of transportation choices

Make development decisions predictable, fair, and cost-effective

Encourage community and stakeholder collaboration in development decisions

Citation: [www.smartgrowth.org](http://www.smartgrowth.org)

However, the definition and goals of smart growth have been used differently. Smart growth<sup>4</sup> means an overall set of broad goals aimed at curbing negative effects of urban sprawl

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<sup>3</sup> Smart growth evolved from the growth controls of the 1960s and the growth management of the 1970s and 1980s. However, the origins of the term can be traced to three key projects of the mid 1990s: Surface Transportation Policy Project (1990), Growing Smart Legislative Guidebook (1997), and Smart Growth and Neighborhood Conservation Act of Maryland (1997) (Godschalk, 2004). The U.S. government also announced a federally funded “Smart Growth Initiative” to combat urban sprawl in 1999 (Anthony, 2004).

<sup>4</sup> Smart growth promotes the formation of compact developments by defining the limits of urban areas, which constrains the supply of land available for new developments. Urban containment encourages the construction of

through integration between environmental protection and local development. The goals usually are to limit outward expansion, encourage higher density development, encourage mixed-use zoning, reduce travel by private vehicles, revitalize older areas, and preserve open space (Koven and Lyons, 2003; O'Connell, 2009; Downs, 2003). Therefore, smart growth policies such as encouraging inner-city redevelopment and designing innovative communities now try to address the relationship between economic development and quality-of-life (Koven and Lyons, 2003). Furthermore, concerns about environmental problems resulting from economic development promote citizen participation in the policy-making process. Local governments, responding to the interests and influence of citizen groups, considered slow- or anti-growth policies, promoted alternatives to pro-growth policies, or reduced business subsidies (Swanstrom, 1985; Clingermayer and Feiock, 1990; Calavita, 1992; Molotch, 1990; Clavel and Kleniewski, 1990). Smart growth attempts to appropriately integrate environmental protection and quality-of-life (Feiock, Tavares, and Lubell, 2008; Koven and Lyons, 2003). Therefore, the principles and strategies of smart growth can be characterized by following four concepts:

- Protecting the natural environment and preserving open space
- Encouraging inner-city redevelopment
- Making it easier to design innovative communities that encourage compact development
- Encouraging community and regional identity (Koven and Lyons, 2003)

However, concerns from smart growth that focuses on urban growth and sprawl are expressed by the scholars who doubt the feasibility and acceptability of contemporary planning policies for controlling sprawl and the extent to which urban containment may be possible or desirable without detrimental social impacts (Couch and Karecha, 2006; Downs, 2003; Gelan, Shannon, and Aitkenhead, 2008). Smart growth tends to place a heavy emphasis on adverse environmental effects. Furthermore, even though advocates of smart growth seek to find common ground for efficient management of development through cooperative interactions among environmental groups, pro-growth groups, and public officials and planners, there are conflicting values among them (Koven and Lyons, 2003; Godschalk, 2004; Campbell, 1996). Various interest groups tend to highlight the characteristics of greatest concern to their own

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compact development while it simultaneously pursues other public goals such as preserving agriculturally or environmentally rich open spaces (Ramirez de la Cruz, 2009).

members. Therefore, the economic development strategies have required changes of fundamental perspectives in order to synergistically integrate conflicting interests of stakeholders.

**Wave 4: Green Economic Development (2000s-Present).** The green economic development perspective is a new field of sustainable development<sup>5</sup> that has emerged from 1980s in order to alleviate problems caused by conventional economic development and to seek new alternatives for these problems (Carley, et al., 2011). However, since 2000, it has expanded quickly with a new approach often referred to as “green growth”, emphasizing environmentally sustainable economic development.<sup>6</sup> The green economic development perspective posits that humans cannot dominate the environment and the environment is no longer an infinite source for development. Humans and their environment are mutually dependent and natural resources have been exhausted over time. Therefore, the emerging green economic development perspective emphasizes that economic costs should be balanced by social/environmental costs and technical choice and design also need to be governed by social/environmental costs (Byrne, et al., 1994). Therefore, green economic development seeks to find sustainable alternative energy and resources bases, which foster low-carbon, socially inclusive development. Accordingly, many local governments have sought to achieve local economic development through energy based green economic development.

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<sup>5</sup> Sustainable Development has become a widely invoked trademark of local, regional, national, and especially international organizations dedicated to promoting environmentally sound approaches to economic development. Even though there are many versions of the origin of sustainable development, there is common agreement that the sustainable development concept was first actively discussed in international organizations. In particular, publication of *The Limits to Growth* by Club of Rome in 1972 marked a turning point in the use of the sustainable development concept (Pezzoli, 1997; Paehlke, 2004). The most widely cited definition of the concept comes from *Our Common Future* (World Commission on Environment and Development, also known as the Brundtland Commission) (Portney, 2003; Pezzoli, 1997). The Brundtland Commission states that “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987: 43). This definition focuses on intergenerational equity, though the commission also puts considerable emphasis on intra-generational equity. The most notable statements of sustainable development were the *Rio Declaration* and *Agenda 21* documented by the 1992 United Nations Conference on Environment and Development (UNCED) known as the Earth Summit. These statements include eradicating poverty worldwide, cutting energy use, protecting ocean resources, promoting sustainable agriculture, controlling toxic wastes, and so on (Pezzoli, 1997).

<sup>6</sup> The Green Growth approach adopted by the 5th MCED(Fifth Ministerial Conference on Environment and Development in Asia and the Pacific 2005) seeks to harmonize economic growth with environmental sustainability, while improving the eco-efficiency of the economic growth and enhancing the synergy between environment and economy.

Energy based green economic development<sup>7</sup> in this study is defined as “environmentally sustainable economic development based on clean and sustainable energy.” Energy based green economic development endeavors to synchronize economic development with environmental sustainability and energy sustainability into coherent decision making, planning, and implementation processes at all levels of governance (Barnes, 2008; Midilli, et al., 2006). Therefore, green business or industry related to energy based green economic development means businesses or industries that provide products and services that increase energy efficiency, produce renewable energy, prevent or mitigate environmental degradation, clean up and restore the natural environment, provide education, expand the use of biofuels in transportation and equipment, and promote agricultural and natural resource conservation.

The reason energy resources are one of the most efficient solutions for green economic development is the intimate connection between energy and economic development (Dincer, 2000). Green economic development requires the production and consumption of clean energy/sustainable resources at reasonable cost. A cost-effective and sustainable supply of energy and resources is the prerequisite for economic development in both industrial and non-industrial sectors (Midilli, Dincer, and Ay, 2006; Dincer, 1999; Carley, et al., 2010). However, the production and consumption of energy/resources have generated significant environmental problems. Conflicts between economic development and environmental protection usually result from the use and scarcity of energy resources (Connelly, 2007; Campbell, 1996). Therefore, energy based green economic development strategies should be put forward to increase renewable energy development and efficient energy use technologies (Midilli, et al., 2006). Accordingly, energy based green economic development includes economic growth, environmental inputs and impacts, efficient and clean energy use and sustainable resources (Paehlke, 2004; Midilli, et al., 2006; Dincer and Rosen, 2005).

However, successful energy based green economic development can be achieved when strategies or plans for economic growth, environmental protection, and clean energy/resource

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<sup>7</sup> “Green” is an abstract and perhaps catchall word for activities and strategies associated with environmental protection and clean energy in economic development (Carley, et al, 2010). Economic development can also be defined differently. According to Malizia (1994: 83), “economic development is the ongoing process of creating wealth in which producers deploy scarce human, financial, capital and natural resources to produce goods and services that consumers want and are willing to pay for.” Economic development has ultimate goals to enhance the collective well-being of communities or countries (Eisinger, 1988).

stability interact functionally and synergistically. The challenge is that progress on one of these plans is often perceived to come at the expense of others, and thus requires significant political effort and coalition building (Zeemering, 2009). Thus, a sustainable governance mechanism is required to heighten reliance on a variety of stakeholders such as non-governmental organizations and other private or quasi-private bodies (Pincetl, 2010) because successful interdependent relationships can be carried out by appropriate formal/informal institutions. Such collaborative mechanisms can succeed when stakeholders with different interests can set aside their current positions on a controversial issue, discover shared values and aspirations, find fresh ways of achieving shared goals, and agree on a strategy for green economic development. Therefore, this study emphasizes two points for successful governance of energy based green economic development: mature social capital and political/legal institutions supporting a synergistic interaction (Chatterton and Style, 2001; Rydin and Holman, 2004).

The importance of mature social capital in green economic development stems from two significant contributions: overcoming collective action problems and reducing transactions costs among stakeholders (Rydin and Holman, 2004). Social capital describes relationships that create trust, norms of acceptance, and a local sense of reciprocal obligation (Hempel, 2009; Coleman, 1988). Social capital literature emphasizes the importance of institutional design in shaping incentive structures for economic development and determining the nature of collective action (Rydin and Pennington, 2000) because both individual and group decisions are embedded in a particular social context that includes community traditions, norms, and networks (Granovetter, 1985). Collective action problems arise in conditions where the costs to each individual outweigh the benefits (Olson, 1965; Ostrom, 1990). Mature social capital can alter the balance of costs and benefits facing individuals and encourage greater involvement and cooperation. Networks and norms of social capital both enhance the advantages of working together and allow for the operation of soft sanctions of blame and loss of reputation when individuals choose not to participate (Rydin and Holman, 2004). In addition, governance for green economic development requires the interchange of ideas, knowledge and resources. Mature social capital can reduce transaction costs by providing ready information on relationships and generating trust by doing what is expected. Therefore, it provides increased reliability and encourages more reciprocity with tit-for-tat arrangements (Putnam, 1993; Fukuyama, 1995; Pretty and Ward, 2001).

However, development stakeholders tend to free-ride on the involvement of others rather than participate themselves. Therefore, political institutions and legal coercion might be required for sustainable governance. Accordingly, this study emphasizes that governance mechanisms can operate well to meet goals under the condition that political and legal institutions can mediate and control relationships and their goals among stakeholders. Generally, since political institutions define decision makers' positions and goals (Clingermayer and Feiock, 2001), these political institutions can substantially influence decision makers' political preferences and policy choices for green economic development. Furthermore, legal institutions serve as foundations to promote and restrict decision makers' political choices and incentives. These institutions are not only products of conflict or congruence among stakeholders related to local economic development, but also mechanisms causing conflict and congruence. Therefore, successful mechanisms for energy based green economic development need to be supported by elaborately built political and legal institutions.

### **1.3 Theoretical and Empirical Importance**

As discussed previously, local economic policy has generally ignored the environmental costs and issues of clean and sustainable energy arising from local economic development activities (Arrow, et al., 1995). Due to extensive use in various industrial and non-industrial sectors, fossil fuels have produced air, water, and noise pollution as well as human health problems (Midilli, Diner, and Ay, 2006). The conventional economic development perspective argued that the environment can be controlled through technological innovation (George, 2007). However in practice, local economic development policy has often given rise to serious air and water pollution, damage to environmentally sensitive lands, and deterioration of central cities (Anthony, 2004; Downs, 1999; Gelan, Shannon, and Aitkenhead, 2008). Therefore, these concerns are at the heart of the green economic development movement in the United States. The energy based green economic development approach is emerging as a potential development movement in the United States. However, formulation of a green economic development agenda does not guarantee the successful implementation of policy tools (Colgan, 1997) because economic development interests are not necessarily in alignment with environmental protection and clean energy/resource stability (Mazmanian and Kraft, 2009; Portney, 2003;\_Campbell,

1996; Saha, 2009). In addition, energy based green economic development inherently involves market failures such as externalities, free riding, and informational asymmetry problems. Therefore, governmental intervention and correction efforts are necessary. Local governments have increasingly targeted their efforts to develop incentive and regulation packages to create conditions conducive to local green economic development.

While the groups oriented toward economic growth emphasize growth through competition and cooperation and seek to take advantage of a variety of financial and non-financial incentives, those oriented toward environmental protection emphasize air and water quality, resource preservation, open space protection, and environmental justice (Koven and Lyons, 2003). Lastly, groups oriented toward energy resources emphasize cost-effective, sustainable supply and consumption for the most efficient utilization of energy resources as key for green economic development (Dincer and Rosen, 2005; Midilli, and Dincer, and Ay, 2006). The different priorities that each group pursues give rise to conflicts, and thus result in negotiation and administrative costs.

Environmental pollution, economic growth and energy/resource development are likely to have environmental and economic impacts across jurisdictional boundaries, producing positive or negative externalities. In particular, the natural environment is generally regarded to be a public good which is not fully reflected in the market price mechanism because of the free riding problem (Portney, 2003). The effects of environmental degradation are also likely to be considered as serious problems only after they reach critical mass. Energy resources and production mechanisms are highly complicated issues that citizens cannot access easily (Brown, 2001). Therefore, the factors reflect a high level of information asymmetry existing between citizens and experts and/or decision makers. Furthermore, many governments are likely to simultaneously pursue deregulation of environmental and economic controls. In order to promote economy and improve environment, government should not apply mix environmental and economic regulations. In other words, while local governments relieve economic regulations, they need to strengthen environmental regulations (ESCAP, 2005). Politicians also are likely to be receptive to promoting long-term goals of environmental protection in spite of businesses' predisposition to pursue short-term profits. In order to promote businesses to be pro-environment and to be involved in clean energy development, local governments need to extend the horizon of businesses to longer-term goals for green economic development.

Systematic study of explanatory factors influencing the use of policy tools for local green economic development is essential to identifying and resolving these conflicts. However, previous literature explains what accounts for the use of policy tools chosen for conventional economic development. In addition, these studies focused primarily on theoretical arguments without investigating empirically and systematically the influence of explanatory factors on the use of policy tools for local green economic development.

Therefore, a critical question exists about whether or not the same factors that determine the use of conventional economic development policy tools explain the use of energy based green economic development policy tools. Investigation of this question will lead this study to explore comparatively both the factors that have explained conventional economic development and the factors that need to be added to model green economic development. This study also addresses the differences of the influences of factors derived from three models to explain local economic development activities: economic pressure, political/institutional choice, and development/environmental coalition model. The answer to this question will identify which model is more significant and efficient to explain green economic development activities. Answering these questions not only addresses important current issues, but also advances the theoretical framework to account for green economic development.

## **1.4 Overview of Dissertation**

Chapter 1 introduces the research inquiry and explains why this question is important to current local economic development. The study then uses four waves to explicate the transition from conventional economic development to energy based green economic development.

Chapter 2 defines and distinguishes two types of policy tools: development incentives and regulatory relief.<sup>8</sup> This chapter outlines their intellectual roots, by integrating two economic approaches to explain local energy based green economic development: neo-classical economics and ecological economics. These two approaches have different emphases and values based on different assumptions in addressing energy based green economic development (Hamstead and Quinn, 2005; Ramos-Mmartin, 2003; Soderbaum, 1990; 1999; 1992; 1994; Pelletier, 2010a;

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<sup>8</sup> Development incentives include both incentives for efficient energy use technology development and incentives for renewable energy development, and regulatory relief involves both regulatory relief for efficient energy use technology development and regulatory relief for renewable energy development.



2010b; Kyro, 2001; Vedeld, 1994; Venkatachalam, 2007), and thus they provide intellectual roots to the distinctions of the two types of policy tools.

Chapter 3 discusses the explanatory models for addressing the use of green economic development policy tools. These models provide a theoretical foundation that supports the investigation of the use of local green economic development policy tools. In the urban development literature, economic development policy tools are addressed using three models: economic pressure, political/institutional choice, and development/environmental coalitions. Using these three models, this chapter systematically investigates the determinants of energy based local green economic development policy tool.

Chapter 4 explicates the research model and suggests hypotheses to measure the influence of explanatory factors on the use of energy based local green economic development policy tools. Factors significantly influencing the use of conventional economic development policy tools are assumed to have the same influence on the use of energy based green economic development policy tools. Therefore, the hypotheses of this study focus on new factors that can be specifically linked to green economic development. Chapter 4 also explains the data, analytical techniques, and estimates procedures used to explore research inquiries described in the previous chapter. This study uses data merged from the *2010 Energy Sustainable Florida Communities Survey* conducted on 327 cities of Florida with populations greater than 1,000 and archival data collected from the 327 cities in Florida. The analytical results will be estimated by a logit model.

Chapter 5 describes data employed for this study and identifies significant factors influencing the use of energy based local green economic development policy tools by applying the analytical methodology described in chapter 4. Specifically, this chapter identifies what factors derived from three policy adoption models influence the use of four policy tools for energy based green economic development: both incentives for energy efficient technology and renewable energy development, both regulatory relief for energy efficient technology and renewable energy development.

Chapter 6 comparatively addresses three issues: the distinctions between the factors based on conventional economic development and the factors based on green economic development, the differences among three models explaining the use of local green economic

development policy tools, and the differences in significant explanatory factors in terms of two types of policy tools and two economic perspectives.

Lastly, chapter 7 presents conclusions including policy implications derived from the findings. Factors derived from the political/institutional choice model and the development/environmental coalition model usually influence the use of incentives for energy efficient technology development and renewable energy development and regulatory relief for renewable energy development. Factors derived from the economic pressure model usually influence regulatory relief for energy efficient technology development. In addition, while factors influencing the use of policy tools for renewable energy development are similar, factors influencing the use of policy tools for energy efficient technology show clear differences. An appealing finding is that recognition of the importance of attracting green businesses significantly influences all development incentives and regulatory relief. In addition, contrary to traditional thinking, Florida citizens registered to the Democratic or the Green Party are less likely to use incentives and regulatory relief for renewable energy. This study also identifies that neighborhood organizations are emerging as pivotal actors in decision making process related to the use of policy tools for green economic development.

## CHAPTER 2

### POLICY TOOLS AND APPROACHES

#### 2.1 Policy Tools

Policies often have ambiguous goals and are designed without consideration for relationships among policies, and thus conflict arises. In order to reduce these problems, Salamon (1989) promotes an investigative approach that focuses on specific instruments and actions used by government, thereby rejecting existing policy implementation research paradigms that examined agencies, programs, actors, and organizations. Salamon (1989:29) defines policy tools as “a method through which government seeks a policy objective.” Policy tools characterize policy actions by government as explicit objects. Because policy tools are instruments to meet goals, they affect implementation patterns (Bobrow and Dryzek, 1987). Policy tools can improve policy implementation by fitting a specific instrument to a particular policy situation and using a specific management strategy geared to that tool (Peters, 2000). From this perspective, policy tools for energy based local green economic development are alternative means to resolve problems arising in local economic development activities.

Policy tools have central characteristics to distinguish them from others. Salamon (1989) suggests four dimensions: the nature of the activity in which government is engaged; the structure of the delivery system categorized into direct and indirect; the degree to which the administration of the program is centralized; and the degree to which programs require detailed administrative action.<sup>9</sup> Additionally, in order to implement policy tools efficiently, decision makers need to consider a variety of conditions. Salamon (1989) recommends three elements: political feasibility, resource availability, and assumed behavior of target population. Since policy tools are essentially political processes, they need to be a more politically feasible way of meeting personnel needs. To achieve policy goals efficiently, resources for implementing policy

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<sup>9</sup> Koven and Lyons (2003) provide three broad categories of policy tools: financial incentives, tax policies, and nonfinancial assistance.

also must be available. Furthermore, policy tools need to be popular and must consider effectiveness in altering the policy targets' behaviors.

Policy tools for energy based green business and industry include both command and control regulations and market-based incentives to synergistically interact and promote these economic development factors (Carley, et al., 2010). Two types of policy tools are distinguished in terms of the nature of the activity in which government is engaged as suggested by Salamon (1989). This study categorizes the policy tools for energy based green economic development to encourage and develop green business and industry into the following two types: "development incentives" and "regulatory relief".

Incentives can provide businesses with motivation to more actively support government's development goals and projects. Incentive tools can be adopted and implemented efficiently when local governments have sufficient financial resources and administrative capability and are precisely targeted to businesses that need such incentives. Therefore, these incentives are likely to be dependent on resources and willingness of local governments and are considered significant factors in promoting businesses' choices and capabilities.

Regulations must be created and implemented at certain levels where businesses can adapt because successful regulations depend on the regulatory compliance of businesses. Hence, many regulations tend to be relieved through regulatory reform (Feiock and Jeong, 2002). Regulatory relief can encourage green economic development activities and strategies for businesses by accommodating regulatory processes to fit their needs. The adoption and implementation of regulatory policy tools is more significantly influenced by administrative capability than financial resources because monitoring and evaluation are important. In addition, regulatory policy tools need to specifically consider the business environment and secure political feasibility. As a result, policy tools for green economic development need to simultaneously consider two types: development incentives and regulatory relief.

## **2.2 Two Types of Policy Tools for Energy Based Local Green Economic Development**

### **2.2. 1 Development Incentives**

Local economic development is politically popular for elected officials and is necessary for fiscal base expansion of local governments (Wolman and Spitzley, 1996; Peterson, 1981). Many economic development activities of local governments are closely associated with incentive offers (Reese, 1993; Fleischmann, Green, and Kwong, 1996). The influence of interest groups, citizens voting with their feet, as well as voluntary efforts of local governments will push local governments to create a variety of the incentives to induce business (Molotch, 1976; Tiebout, 1956). Therefore, local governments have competed and created a variety of incentives to retain existing businesses, attract new businesses, and create new jobs. The reason why local governments provide incentives to businesses first is not only to spur economic growth and decrease unemployment of residents, but also to maintain rapid growth of communities (Rubin and Rubin, 1987).

However, administrative and legal capacities of local governments can be determinants for an incentive offer. Fiscal condition is also an important factor in determining the types and extent of incentives offered for local economic development (Rubin and Rubin, 1987). Since incentives are ex-ante instruments to attract businesses for local economic development, information asymmetry, specifically adverse selection problems, can occur. For example, incentive offer for energy efficient technology and renewable energy development have high uncertainty because expected results are not secured and may need continuous investment. Energy based green economic development especially is likely to require high sunk costs because technological and institutional progress should be achieved and new infrastructures for alternative energy and energy efficient technology development need to be established. Therefore, some businesses with short-term time horizons are not likely to invest huge amounts to upgrade technology and develop sustainable renewable energy. When some businesses want to obtain new technology, the businesses opt to free ride rather than investing for themselves. Therefore, governments need to provide green business and industry with a variety of incentives in order to encourage businesses to continuously invest and to upgrade technologies and strategies for green business for themselves (ESCPA, 2005; Kahn, 2006).

Economic development incentives vary markedly (Rubin and Rubin, 1987; Koven and Lyons, 2003). Common incentives are financial incentives such as grants, subsidized loans, tax-

exempt bonds, and equity financing. Tax policies such as tax abatements, tax exemptions, and tax increment financing are also common incentives to attract and expand businesses. Local governments also provide a variety of non-financial assistance such as land banks, industrial parks, enterprise zones, and employee training programs. In order to promote green economic development such as technologies for renewable energy production, solar energy system development, and energy infrastructure, local governments currently are taking advantage of tax credits, tax exemptions, and grant programs, and so on (The Florida Energy Systems Consortium, 2010).

### **2.2. 2 Regulatory Reliefs**

Environmental regulations are often a barrier to economic development. Many local governments have experienced the need for regulatory relief because regulations often create greater market distortions, rather than correcting market failures. Increased production costs resulting from compliance with environmental regulations lead to reduced output, higher prices, and reduced income growth (Christiansen and Haveman, 1981). In fact, because indirect and direct costs of regulations reduce productivity growth, the rise of regulations and decline in productivity occurs at the same time in American industry as a sluggish economy (Meier, 1985; Denison, 1979). In addition, some regulatory goals might be impossible to meet because of high requirements or the lack of resources (Meier, 1985).<sup>10</sup> Complicated regulatory procedures also result in costly delays (Feiock and Jeong, 2002).<sup>11</sup> Therefore, too high goals or complicated procedures can instead promote businesses' opportunistic strategies. Furthermore, regulations may discourage willingness of businesses that participate in new energy use technology or renewable energy development, and generate more time, administrative, and financial costs in the processes to meet these procedures. Because complex, unclear, or inconsistent regulation creates risk for new investment and thus discourages new investment (Wasylenko and McGuire, 1985; Clingermaer, 1989), businesses perceive the friendliness of regulatory policy toward business as a determinant when deciding on investment locations. Once a business decides to locate in a jurisdiction, local governments' policy and regulation becomes an important

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<sup>10</sup> For example, the Clean Water Act required "zero discharges" in the 1980s.

<sup>11</sup> For example, the Nuclear Regulatory Commission took 10 years to license a new plant (Meier, 1985).

consideration (Waslyenko, 1980; Bartik, 1991). Therefore, in order to attract or retain businesses, local governments need to relieve regulations. Streamlined processes will reduce uncertainty and transaction costs for businesses by simplifying regulations (Feiock and Jeong, 2002). In particular, in order to bridge the gap between long-term economic and environmental benefits and businesses' short-term commercial benefits, local governments need to flexibly apply development regulations to economic development activities of businesses (ESCAP, 2005). Stringent and complicated regulations may enlarge the gap and create uncertainty. Rather than specify how businesses should abide by several procedures and stringent standards, it might be more efficient to provide business with regulatory relief or streamlined processes for promoting green businesses and industries. Rather, regulatory relief to assist businesses' economic activities can reduce risk and uncertainty and might lead to their involvement in better development activities for local green economic development.

### **2.3 Economic Perspectives Explaining Policy Tools for Energy Based Local Green Economic Development**

Where will we seek policy tools for energy based green economic development? Economic perspectives explaining green economic development suggest different alternatives depending on the values that each perspective emphasizes and their predispositions. Recognizing that there may be considerable overlap, it is nevertheless possible to characterize their orientations and values depending on the dominant intellectual foundations of each perspective.<sup>12</sup>

The changes and emphases of conventional economic development toward emerging green economic development have been addressed by one mainstream economic school (neoclassical economics) and one heterodox economic school (ecological economics) (Kyro, 2001; Dillard, 1967). Neoclassical economics have been a mainstream mean to address economic development. However, neoclassical economics have given rise to many market failures and

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<sup>12</sup> Classical economics has been identified as a grandfather for all other economics schools. At the end of the 1800s, Adam Smith emphasized that work had greater value for the wealth of nations than land. His thoughts laid the theory for economic growth based on the law of the invisible hand. His ideas based on rational equilibrium generated three different paradigms in concerning green economic development: neoclassical economics; new institutional economics; and ecological economics.

could not appropriately deal with burgeoning environmental and energy/resource problems. Therefore, ecological economics emerged premising an environmental and resource prerequisite. These two economic perspectives have attempted to address green economic development strategies and changes, and sought different alternative policy tools for green economic development. In the following sub-section, I consider two economic perspectives to identify the theoretical roots of green economic development policy tools.

### **2.3. 1 Neo-Classical Economics**

Early neoclassical economics<sup>13</sup> did not try to involve and/or address a variety of issues, such as environmental pollution and resource development problems because it ignored the natural limits to growth and the important interdependency between economy and environment (Sollner, 1997). The primary value of neoclassical economics is economic welfare and other values were likely to be instrumental for economic value. Neoclassical economics still assumes that innovative technologies and efficiency can reduce trade-offs between economic growth and environmental problems and resolve energy and resource problems.

As environmental pollution and energy crises became serious in the middle of 20th century, neoclassical economics attempted to consider environmental and energy/resource issues (Hempel, 2009). However, neoclassical economics considers these issues, based on economic criteria.<sup>14</sup> This perspective seeks to find alternatives to resolve problems from economic growth

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<sup>13</sup> Neoclassical economics is a theory of voluntary exchange for efficient allocation of scarce resources (Caporaso and Levine, 1992; Hamstead and Quinn, 2005). Neoclassical economics premises methodological individualism, unbounded rationality, Pareto efficiency, and general equilibrium (Venkatachalam, 2007). Neoclassical economics begins with the idea of the maximization of individual satisfaction and that satisfaction is determined by rational choice based on perfect information that can be used to rank options. Neoclassical economics assumes that perfect competition can result in Pareto optimality and that optimality is decided by the equilibrium of the market. Therefore, restrictions on market competition will lead to non-optimal outcomes (Caporaso and Levine, 1992). Neoclassical economics still emphasizes that environmental problems and resource scarcity can be appropriately dealt with by extending the tools and principles of neoclassical economics without altering their fundamental structure (Heyes, 2000).

<sup>14</sup> For example, the optimal level of pollution is determined by the marginal costs and marginal benefits of controlling pollution (Venkatachalam, 2007). Neo-classical economics approaches energy and natural resources in terms of relative scarcity (Christensen, 1996) because it posits that markets serve as self-sustaining mechanisms that supply and demand adjusts according to the depletion of natural resources (Portney, 2003) and are assumed to play a role in increasing marginal productivity of energy and resources (Barnett and Morse, 1963; Panayotou, 2000). Neo-classical economists argue that governmental intervention is inevitable and suggests environmental regulations, quotas on pollution, taxes on pollution, and financial and non-financial incentives.



and realize green economic development by improving economic efficiency based on technological innovation, thereby minimizing environmental pollution, and resource scarcity (Hamatead and Quinn, 2005). Therefore, this perspective emphasizes that local governments must devote their efforts to developing new technology fitted to green business and industry. In this sense, incentives and regulatory relief for energy efficient technology development are underpinned by this economic perspective.

### **2.3. 2 Ecological Economics**

Ecological economics<sup>15</sup> contends that neoclassical economics cannot resolve essential environmental problems and secure energy/resource sustainability. It argues that technology has not solved many past environmental problems and indeed has created several new problems thus imposing social costs (Daly and Cobb, 1989). Ecological economics also emphasizes that environment and economy are not necessarily in conflict (Brooks, 1992; Grossman and Krueger, 1995; Andreoni and Levinson, 2001; Feiock and Stream, 2001).<sup>16</sup> Ecological economics is sensitive to the balance of ecosystems. Even though ecological economists also recognize that economic value is important (Venkatachalam, 2007), they assert that the economy must be embedded within an ecosystem. Thus, ecological economics emphasizes that environmental sustainability is a prerequisite to sustainability in any other sphere (Pelletier, 2010b; Soderbaum, 1999). Therefore, ecological economists emphasize interdependency for sustainable growth and ecosystems (Brunk and Hunter, 2008).

Because of this perspective, while neoclassical economists are likely to be optimistic regarding technology, ecological economists are inclined to be pessimistic regarding technology. Therefore, ecological economists seek to develop new alternative energy resources that can realize environmental sustainability and energy stability, rather than technology development for

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<sup>15</sup>Ecological economics emerged to bring economists and ecologists closer together in a common search for appropriate solutions for environmental challenges (Soderbaum, 1994). Even though ecological economics began in the 1960s, its concerns to consider environmental and ecological issues together on the analysis of human-economy-environment interaction formed in the 1980s (Kyro, 2001; Venkatachalam, 2007).

<sup>16</sup> Feiock and Stream (2001) argue that institutional arrangements for environmental regulation may enhance economic development rather than impeding it. Lorah and Southwick (2003) also argue that environmental protection is correlated with relatively rapid population growth and with relatively rapid income and employment growth.

improving efficiency. Accordingly, ecological sustainability is sought for clean and renewable energy use and development. Therefore, incentives and regulations emphasize environmental protection, renewable energy, natural resource stability, and development within an ecosystem, rather than energy efficient technology development (Venkatachalam, 2007; Vedeld, 1994). Integrating neo-classical economic and ecological economic perspectives with development incentives and regulatory relief, policy tools for energy based green economic development can be categorized into four types. Table 2.1 depicts the typology of policy tools for energy based green economic development used in this study.

**[Table 2.1] Typologies of Policy Tools for Energy Based Green Economic Development**

	<b>Development Incentives</b>	<b>Regulatory Relief</b>
<b>Neo-Classical Economics</b>	Incentives for Energy Efficient Technology Development	Regulatory Relief for Energy Efficient Technology Development
<b>Ecological Economics</b>	Incentives for Renewable Energy Development	Regulatory Relief for Renewable Energy Development

## **CHAPTER 3**

# **EXPLANATIONS FOR THE USE OF INCENTIVES AND REGUALTORY TOOLS**

Economic development is the unitary interest of local governments and they are structurally compelled to pursue economic developmental policy choices rather than social policy choices (Peterson, 1981; Wolman and Spitzley, 1996). Local governments have not only continuously developed new strategies and incentives for energy based green economic development, but also have improved and revised conventional economic development policies in order to appropriately adapt them to green economic development. Therefore, this study derives explanatory factors influencing the use of policy tools for energy based green economic development, traversing the transition from conventional economic development to green economic development. Factors influencing the use of policy tools for energy based green economic development are addressed by three explanatory models: the economic pressure model; the political/institutional choice model; and the development/environmental protection coalition model. Explanatory factors categorized into conventional economic development factors and green economic development factors are nested to each of these three models. This categorization does not mean that conventional and green economic development factors are mutually exclusive. The factors emphasized in conventional economic development may still influence green economic development, and the critical factors in green economic development might already be considered important in conventional economic development. Therefore, this study examines how the importance of conventional and green economic development factors differ depending on the given circumstance. Specifically, the explanatory factors described in conventional economic development factors have already been empirically verified in conventional economic development activities. The explanatory factors described in green economic development factors are able to be considered more prominently in green economic

development activities than in conventional economic development activities. The explanatory factors used in this study are summarized in Table 3.1

**[Table 3.1] Explanatory Factors of Green Economic Development**

	<b>Economic Pressure</b>	<b>Political/ institutional choice</b>	<b>Development/ environmental coalition</b>
<b>Factors Influencing Conventional Economic Development</b>	-Fiscal condition -Economic stress -Development competition	-Governmental structure -Administrative capacity -Voters' preference	-Private development organizations -Public organizations
<b>Factors Influencing Green Economic Development</b>	-Environmental protection -Standard of living -Development collaboration	-Expertise and informational resources -Preference for attracting green businesses	-Environmental protection organizations -Neighborhood organizations

### **3.1 Economic Pressure Model**

#### **3.1.1 Conventional Economic Development Factors**

The economic pressure model assumes that local economic development policies are determined by economic forces rather than by political choice (Wong, 1988). Therefore, this model views the use of development policy as a response to the economic conditions of municipalities (Wong, 1988; Feiock and Clingmayer, 1992; Feiock, 1989; Ramirez de la Cruz, 2009, Kwon, et al, 2009; Hammer and Green, 1996). Policy tools in this approach are instrumental responses to improving economic conditions (Hammer and Green, 1996; Ramirez de la Cruz, 2009). This model generally pays attention to fiscal conditions, economic stress, and development competition as determinants that promote local economic development activities and policy tools.

**Fiscal condition.** Fiscal health can significantly influence the use of policy tools for green economic development. While lack of fiscal capacity promotes a need for development, it

can constrain development strategies (Kwon, et al., 2009). Even though local governments can increase tax rates and reduce public services, these prescriptions are politically unpopular (Sullivan and Green, 1999; Rubin and Rubin, 1987). Instead, cities suffering fiscal stress will focus on local development policies to attract new businesses and to retain and extend existing businesses (Hammer and Green, 1996). Fiscal stress will lead local governments to heighten efficiency in the formation and implementation of energy based green economic development policies. Therefore, local governments with fiscal stress will encourage efficient energy use more. Because they might concentrate on reducing risk and uncertainty of offered incentives, local governments with healthy fiscal conditions provide a variety of incentives to encourage efficient energy use. In addition, they will prefer to apply regulations stringently to reduce the uncertainties of incentives. On the other hand, local governments with poor fiscal conditions will not require stringent regulations and will prefer to provide non-financial incentives or streamlined processes in order to encourage efficient energy use and thus reduce administrative costs. In addition, green economic development generally requires long-term planning and continuous support. Therefore, local governments that are not fiscally healthy may prefer to attract green businesses through regulatory relief or non-financial incentives rather than offering financial incentives.

As environmental pollution due to the fossil fuels has become more serious, local governments have diversified efforts to develop sustainable alternative energy. Renewable energy is a potential alternative in most countries and their municipalities. Therefore, fiscally healthy local governments will seek to develop renewable energy. On the other hand, fiscally stressed local governments might focus on businesses that are visible and can generate short term effects rather than green businesses that need long term investment. Therefore, local governments with healthy fiscal conditions are more apt to provide more financial support and craft a variety of incentives for renewable energy development than local governments with poor fiscal conditions. In addition, local governments with healthy fiscal conditions can more actively address environmental problems and thus be more focused on promoting renewable energy development. Therefore, in order to promote renewable energy development and reduce administrative costs and procedures, local governments will relieve regulations and provide streamlined processes.

**Economic Stress.** Economic stress can be used as a determinant to estimate local economic development activities (Sharp, 1991) because economic stress can significantly promote the willingness of local governments to encourage community development. As the economic condition of local governments deteriorate, local governments must develop new jobs and expand existing jobs. However, efficient energy use technologies might require development costs and time. Therefore, making new technologies are expensive. Thus, if there are no financial or other incentives available, businesses that tend to be dependent on short-term market mechanisms and commercial interests are not likely to invest their own finances to develop technologies with high uncertainty. Therefore, local governments with serious economic stress might focus on providing existing or potential local green businesses with a variety of incentives to enhance technology development for efficient energy use. In addition, efficient energy use technologies typically need an energy infrastructure (smart grid), battery storage, plug-in hybrids, and economic dispatch technology. It is not easy for public officials to have expertise in all these technologies. However, if local governments are likely to establish complicated and stringent procedures to control businesses, these regulations might become barriers to developing the technology for efficient energy use. Accordingly, regulatory relief might promote more technology development for efficient energy use and thus allow technology development and dissemination to expand. Therefore, local governments with economic stress will relieve regulations in order to encourage for businesses to incorporate efficient energy use technologies.

There is common agreement that renewable energy can provide economic benefits through job creation (Wei, et al., 2010). Therefore, subsidizing renewable energy development may create new jobs in the construction and operation phases. Accordingly, local governments with serious economic stress will support renewable energy development by various tools. Renewable energy is still in an immature stage and needs continuous investment to promote development. Therefore, local governments must encourage businesses to continuously expand renewable energy use. Sensitive to short term market mechanisms, businesses might not be attracted to the use and development of renewable energy that is unstable and requires financial and human capital if there are no financial and other incentives to support businesses. Businesses might prefer to wait for the development of a commercialized energy that can be used inexpensively. Therefore, in order to promote renewable energy, local governments will provide businesses with a variety of financial or other incentives. In addition, economic development

regulations have performance standards and governments must document decisions about how stringent the regulation will be. However, setting a stringent standard and complicated procedure for renewable energy development and its use can weaken the motivation of businesses to invest in renewable energy development. Thus, if several procedures are delayed due to government approval and governments continuously interrupt the process of renewable energy development, businesses' motivation and willingness might be weakened and renewable energy development will be delayed. Simplifying the application and approval process for both businesses and administrators might be beneficial to promoting renewable energy development (Jacobson, et al., 2009).<sup>17</sup> Therefore, as the economic stress of local governments increases, local governments will relieve regulations as well as provide streamlined processes to reduce administrative and time costs of businesses.

**Development Competition.** The need to attract new businesses and homeowners places local governments in a position of competition with other similar governments or their closest neighbors (Hammer and Green, 1996; Tiebout, 1956; Wong, 1988). Within their geographic region, local governments also will attempt to match the policies of jurisdictions that have a similar or comparable economic condition (Berry and Berry, 1999; Feiock and Clingermayer, 1992; Feiock, 1989; Hammer and Green, 1996). Competition for economic development of local governments promotes visible subsidies or projects (Wolman and Spitzley, 1996, Feiock and Clingermayer, 1992; Green and Fleischmann, 1991). Capital mobility forces local governments to provide more economic development incentives that are favorable to business. Therefore, as development competition increases, local governments seek to provide more incentives for industry development or housing development to attract businesses with a high tax base and residents with high income. Accordingly, as development competition increases, local governments tend to provide businesses with more financial/non-financial incentives or relieve regulatory tools that delay local development in order to attract more businesses or retain existing businesses (Wolman and Spitzley, 1996).

This development competition is particularly salient in metropolitan areas. Since cities within metropolitan areas are geographically adjacent and thus human and financial resources are

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<sup>17</sup>For example, biomass power plants can be restricted by stringent environmental regulations during the procedure of location decision or facility construction.

likely to be mobile (Tibout, 1956), cities of metropolitan areas are more apt to compete with neighboring cities. In particular, central cities might be competitive in order to attract or retain mobile human and financial capitals. Central cities of metropolitan areas generally have essential infrastructures and relatively more local businesses. Thus, central cities of metropolitan areas tend to have more beneficial incentives to attract new businesses and retain existing businesses (Wassmer and Anderson, 2001), and businesses prefer to be located in central cities of metropolitan areas. Therefore, while neighboring cities might cooperate with the central cities on many cooperative development issues, central cities must still compete with other central cities to retain and/or attract human capital and businesses and to provide better market conditions and business environments.

In particular, support for energy efficient technology development can become a significant incentive to attract green businesses and will promote building infrastructure to realize environmental conservation, heat island reduction, and de-carbonation. However, these efforts entail a lot of cost because conservation and recovery of energy/environment are likely to generate high sunk costs and may require continuous investments over a long period of time. Therefore, as competition for local economic development increases among local governments, local governments are likely to provide more financial or other incentives to promote efficient energy use and related technology development. In addition, local governments will relieve regulations and provide streamlined processes in order to allow businesses to more easily access and implement governmental projects and incentives.

Renewable energy is the most viable potential alternative to simultaneously resolve environmental pollution and energy sustainability. However, renewable energy development generally requires high sunk costs (ESCPA, 2005). Accordingly, governments must complement the short-term interests of businesses in order to encourage them to invest capital and time for renewable energy development. Therefore, as development competition increases, local governments will seek to build appropriate business conditions for renewable energy development and thus provide businesses with more financial or other incentives targeted to renewable energy. In addition, local governments need to help businesses access these incentives more easily. Therefore, local governments will relieve regulations and simplify the administrative processes required for renewable energy development.



### 3.1. 2 Green Economic Development Factors

While conventional economic development policy tools generally target economic efficiency and quantitative growth, policy tools of green economic development emphasize quality-of-life and environmental conservation. Fiscal conditions, economic stress, and development competition still will be considered significant indicators. However, green economic development places more emphasis on qualitative growth and considers quality-of-life as an important condition. Therefore, the policy tools for green economic development are significantly influenced by factors related to standard of living and the environmental problems of local governments (Gorboets, 2007). In addition, since the policy tools for energy based green economic development have to synergistically integrate environmental and energy issues with economic growth initiatives and build inter-jurisdictional cooperative mechanisms, cooperative mechanisms among other local governments or agencies need to be emphasized. Therefore, this study takes into account the extent of environmental pollution, standard of living, and intergovernmental development collaboration.

**Environmental Protection.** Environmental protection is a prerequisite in green economic development. Therefore, environmental pollution will provide motivation to craft a variety of policy tools for green economic development based on environmental protection and thus promote policy tools related to it. Factories, transportation, and housing heating and their energy use are main sources of environmental pollution. As environmental pollution becomes serious, homeowners realize that their property value will decrease. Residents will move out of the city and potential residents will choose not to move in. As a result, housing owners and development businesses can demand redevelopment by voting with their feet or lobbying (Kahn, 2006). Therefore, local governments will seek to pursue more green economic development in order to simultaneously achieve environmental protection and development requests.

In practice, energy is a major source of environmental pollution (Marcus, 1992). In order to reduce environmental pollution, communities must use clean energy and do so more efficiently. Therefore, renewable energy and efficient energy use are significant conditions to reduce environmental pollution and promote green businesses. Accordingly, as environmental

pollution increases, local governments will provide financial or other incentives to encourage energy efficient technology and renewable energy development. In addition, increasing environmental pollution will increase risk and uncertainty of environmental pollution and local governments might not easily relieve regulations related to energy efficient technology and renewable energy development. Rather, they may apply more stringent regulations to energy use and development procedures.

**Standard of Living.** People attempt to move to safe and environmentally clean communities with better infrastructure and educational systems. Businesses also tend to follow mobile human capital for market and better employment opportunities. Therefore, local economic development plans tend to regard the living conditions of communities as an important factor (Koven and Lyons, 2003). In general, communities with a high standard of living as reflected by high housing value have a better residential environment in terms of environment and safety, educational system and businesses conditions. These communities seek to retain a clean environment with convenient infrastructure for living conditions. Infrastructure for energy efficient technology and renewable energy can become determinants to keeping clean residential conditions and to attracting green businesses. Therefore, communities with a high income level will more actively apply incentives for energy efficient technology and renewable energy development in their economic development strategy.

However, communities involving industrial sites and sewage treatment facilities generally have decreased value while communities with easy access to green space and with good school systems will have increased value (Kahn, 2006). Therefore, in order to maintain or increase their property values, wealthy communities will attempt to recruit and seek clean industries such as research and development (R&D) facilities and operation headquarters (Koven and Lyons, 2003). Accordingly, wealthy communities might focus on promoting energy efficient technology and renewable energy development. Therefore, they will promote regulatory relief for energy efficient technology and renewable energy development to provide green businesses with convenience and greater incentives.

**Development Collaboration.** Successful local green economic development can be achieved when stakeholders and local governments pursuing different values and goals synergistically interact under sustainable governance mechanisms. Therefore, collaboration

among local governments or agencies needs to be emphasized in green economic development activities and the use of policy tools related to these development activities. In this sense, the economic pressure model needs to consider competition and cooperation together as determinants influencing the use of policy tools for green economic development.

Intergovernmental collaboration is a useful mechanism for sharing information and a variety of resources related to local economic development because it can facilitate the flow of resources and information by exchange among governments or other organizations (Andrew, 2009; Scott and Davis, 2003; Flora and Flora, 1993; Carr, LeRoux, and Shrestha, 2009). Therefore, cooperative mechanisms provide local government with opportunities and information to fix a variety of problems that occur with local economic development. Local governments will have more opportunities to access a variety of incentives and regulations for green economic development from other governments and will learn strategies to take advantage of incentives and regulations.

Local governments can learn and emulate various skills and strategies from other governments to promote energy efficient technology development with their business communities through cooperative relationships with other governments. Therefore, as cooperation among local governments or agencies increases, local governments will seek to provide businesses with more financial or other incentives to promote the development of efficient energy use technologies and lower regulatory barriers and thus increase the businesses using energy efficient technology.

Clean and sustainable energy development requires a variety of ex-ante information related to energy resources, technology, and geographical conditions. Frequent interactions between governments will promote informational exchanges related to successful incentives and strategies for renewable energy development. These cooperative relationships will assist local governments in being more flexible and efficient by providing financial or other incentives and managing regulations for renewable energy development. Accordingly, as cooperative mechanisms become more active, local governments are likely to provide businesses with more financial or other incentives and streamlined processes for renewable energy development.

### **3. 2 Political/Institutional Choice Model**

### 3.2 .1 Conventional Economic Development Factors

This model argues that local governments do not simply respond to economic pressures and that making urban development policy can be influenced by political choice (Wong, 1988). The political/institutional choice model posits that the political or institutional choice of local governments may promote or impede the use of development policy tools (Wong, 1988; Feiock and Clingermayer, 1992; Feiock, 1989; Ramirez de la Cruz, 2009, Kwon, et al, 2009; Hammer and Green, 1996). This model suggests the use of policy tools can be embedded in institutional practices and dominated by political influence (Wong, 1988). Institutional promotion or constraint can significantly influence the use of policy tools for economic development. Therefore, political and institutional factors such as governmental structure, voters' preference, and administrative capacity are a central force.

**Governmental Structures.** Governmental structures, in general, define public officials' roles and power in public authority and thus make a significant difference when adopting new policies (Feiock, 1989; Feiock and Clingermayer, 1992). Therefore, the structures of local governments can influence the use of policy tools for green economic development. Elected officials are likely to favor local economic development because development policy is a policy area to achieve both their own political goals and economic responsibility for citizens. Due to frequent election cycles, elected officials tend to have a shorter time horizon than appointed officials (Weimer and Vining, 2004). They also tend to have high-power incentives for reelection and so may support business interests because businesses are better able to provide election funds (Feiock, 1989). Therefore, elected officials may prefer to choose pro-growth and visible development policies (Wolman and Spitzley, 1996). However, appointed officials may have a greater predisposition toward policy innovation than elected officials because appointed managers are inclined to concentrate on developing better career options through efficient management (Clingermayer and Feiock 2001).

Today, most local governments seek to change growth oriented policy tools to eco-friendly policy tools for local green economic development. Therefore, elected officials will seek to adopt policies and plans for green economic development. Elected officials generally prefer green infrastructure such as green parks, open space, and green buildings that can show visible achievement with short term investment. However, the development of renewable energy or

efficient energy use technologies might not be realized during the elected officials' term in office. These policy tools also are invisible and require long term investment. Accordingly, incentives and regulatory relief for development of energy efficient technologies and renewable energy might be unpopular for elected officials. On the other hand, appointed officials might be interested in technologies for efficient energy use and renewable energy development because these officials pursue efficient management and innovation to enhance their careers. In addition, appointed managers tend to serve a local government for a longer period of time than elected officials (Clingermayer and Feiock, 2001). Therefore, cities with a council-manager form of government might prefer to provide incentives and relieve regulations to develop technologies for efficient energy use and renewable energy.

**Administrative Capacity.** Previous studies argue that the number of bureaucratic professionals can influence the ability to create and implement a variety of strategies for economic development (Sullivan and Green, 1999; Sullivan, 2002). Local public officials are likely not to be positive toward the self-interested and opportunistic behaviors of businesses. Therefore, public officials seek to monitor these opportunistic strategies or control offered incentives through institutionalized procedures. As incentives or regulations increase governments must pay increasing attention to behaviors of businesses (The Florida Energy Systems Consortium, 2010). Accordingly, sufficient staff is a necessary condition to efficiently implement and monitor a variety of incentives and regulations. In other words, as the number of local government staff increases, local governments can apply more incentives and regulations to local economic development.

Local governments offer financial or other incentives for green economic development.<sup>18</sup> Since local governments will augment administrative capacity to manage these incentives as the number of bureaucratic staff increases, they can more easily control incentives for renewable energy development or efficient energy use technologies. However, renewable energy development or efficient energy use technologies cannot be achieved over a short term time and the results also have high uncertainty in terms of feasibility and marketability. Therefore, these incentives also may have high uncertainty that does not generate expected effects as many

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<sup>18</sup> For example, the State of Florida is using Renewable Energy Property Tax Exemption, The Renewable Energy Production Tax Credit, The Solar Energy Systems Equipment Sales Tax Exemption, the Renewable Energy Technologies Grants Program, Renewable Energy Equipment Sales Tax Exemption, Solar Energy System Incentives Program, and so on (The Florida Energy Systems Consortium, 2010).

development incentives do not benefit the city as much as the cost of the incentives (Sullivan, 2002). Therefore, if administrative capacity is available, while local governments provide a variety of incentives, they also might strengthen regulations related to renewable energy development or efficient energy use technologies to reduce the risk and uncertainty of incentives provided.

**Voter Preference.** Political decisions are often presumed to be representative of citizens' preferences. According to previous studies, Democrats are more pro-environmental than Republicans (Dunlap and Allen, 1976). While Democrats are generally more in favor of environmental issues such as climate change initiatives, Republicans are more likely to be opposed to them (Krause, 2011a; 2011b). Traditionally, Republicans, relative to Democrats, have maintained a more pro-business orientation and prefer to provide businesses with tax incentives. Therefore, previous studies hypothesized that Republicans would give significantly less support to policies for environmental protection. According to Strand's (1981) interviews of 1,003 adult residents in California, energy policy preferences also are partially related to political party identification. Democrats will prefer clean energy and energy efficient technology that can realize environmental protection in local economic development and energy use.

In this sense, Democrats will support development of sustainable energy such as solar, wind, water that can protect the environment from pollution and be sustainable without exhaustion. Therefore, Democrats will advocate that local governments provide financial or other incentives in order to encourage energy efficient technology in new development. Accordingly, as the number of Democrats increase, local governments are more likely to promote the use of financial or other incentives for energy efficient technology development to attract green businesses or industry.

However, Democrats might have reservations about renewable energy such as biomass power that can generate environmental pollution, negative externalities, and energy sprawl. Even though Democrats might support the development of clean and renewable energy that can be free from environmental pollution, they are less likely to support the development of renewable energy such as biomass and wind power that may result in negative environmental consequences. In addition, they might prefer to strengthen regulations, rather than providing financial incentives that are a pro-business orientated approach (McDonald, et al., 2009). In this sense, Democrats

might be less likely to relieve regulations related to renewable energy development that might cause environmental pollution. Therefore, Democrats, relative to Republicans, are more likely to strengthen regulations related to efficient energy technology and renewable energy development. Accordingly, as the number of Democrats increases, local governments will be likely to discourage regulatory relief.

### **3.2 .2 Green Economic Development Factors**

Successful green economic development requires comprehensive understanding of a variety of incentives and regulations related to green building regulations, renewable energy tax exemption, solar energy grants, and green taxes, and local governments have to synergistically apply them to local businesses. Therefore, local governments must acquire greater expertise on a variety of policy tools for green economic development. In this sense, the emphasis of the expertise needs to be more on green economic development than conventional economic development. In addition, since the choice of policy tools for economic development is a product of political bargaining (Ha and Feiock, 2011; Steinacker, 2002), the extent to which decision makers place priority on attracting green businesses can substantially influence the choice and implementation of policy tools for green economic development.

**Expertise on Green Economic Development.** In order to efficiently manage the diverse institutions of green economic development, local governments must accumulate experience and expertise related to policy tools for green economic development. Local governments with more expertise and experience will lead administrators to work innovatively and to serve with professional knowledge (Kwon, et al., 2009).

Lack of expertise due to poor information and experience of local governments might provide businesses with a variety of opportunities to behave strategically. Businesses can exploit local governments that do not have sufficient information and experience. The development of energy use technologies and renewable energy has high uncertainty and risk because the results cannot be anticipated. Therefore, implementation of these strategies will generate high information and administrative costs. Accordingly, if local governments experience substantial

obstacles due to lack of expertise and information resources, they will prefer not to apply incentives that can encourage efficient energy use technologies and develop renewable energy.

Due to diversification and complexity of green economic development policies, the use of these policies may result in a variety of market failures which cannot be treated only with incentives. However, businesses will be still self-interested and opportunistic in green economic development. Therefore, they are likely to make efforts to increase productivity in the short run, rather than long term investment for eco-friendly technology development. Accordingly, regulations will be essential instruments to constrain or encourage green businesses and industries. Local governments experiencing lack of expertise will more stringently apply regulations related to the development of energy efficient technology and renewable energy.

**Preferences for Attraction of Green Businesses.** In times of economic stress, some local governments enthusiastically recognize the importance of local economic development due to citizens' or interest groups' demands and/or experts' suggestions. These demands and suggestions provide local governments and their decision makers with the motivation to devote themselves to economic development (Ha and Feiock, 2011). Thus, the priority status toward green economic development in a local government will shape local government's willingness and positive recognition to more actively develop local green economic development policy tools, and thus will promote political feasibility.

In this sense, local governments with stronger preferences for attracting green businesses will seek to create a variety of advantages for green business or industry in order to attract new business and to retain existing businesses. The most typical beneficial policy tools are financial or other incentives. In particular, these incentives are important for projects requiring continuous development and consistent investment. Therefore, local governments with high priority for attracting green businesses will provide a variety of incentives to encourage energy efficient technology and renewable energy development.

Additionally, stringent constraints of business activities and time-consuming administrative processes are likely to become high barriers discouraging the involvement of businesses. In order to attract businesses to projects with high uncertainty such as renewable energy and energy efficient technology development, local governments need to minimize



regulatory barriers and thus time costs and administrative costs in order to make it easier for businesses to access a variety of governmental supports and to share information for promoting green economic development. Therefore, local governments with a higher preference for attracting green businesses are more likely to relieve regulations and provide streamlined processes for energy efficient technology and renewable energy development.

### **3.3 Development/Environmental Coalition Model**

#### **3.3.1 Conventional Economic Development Factors**

Economic growth policies create losers as well as winners. A variety of stakeholders try to maximize their interests by forming coalitions for stronger political power (Ramirez de la Cruz, 2009). The premise of the development/environmental coalition model is that anti- or pro-growth coalitions significantly influence and lead the use of local development policies (Wong, 1988; Feiock and Clingermayer, 1992; Feiock, 1989; Ramirez de la Cruz, 2009, Kwon, et al, 2009; Hammer and Green, 1996). Economic growth in conventional economic development was a product of conflict between pro-growth developers and anti-growth groups. Traditionally, key actors in local economic development are private developers and governments, and neighborhood organizations and environmental protection organization are likely to be excluded from decision making processes for local economic development. Even though neighborhood and environmental protection organizations are sometimes actively involved in decision making for local economic development, private developers and governments are likely to form coalitions with each other and isolate neighborhood and environmental protection organizations from decision making processes for local economic development. Thus, the key decision makers in conventional economic development activities are private developers and public organizations.

**Support of Private Development Organizations.** Local governments are structurally dependent on growth coalitions (Molotch, 1976; 1990)<sup>19</sup> because of business's capital mobility, the small size of urban jurisdictions, and dependence on business investment. On the other hand, businesses provide jobs and income to city residents and generate local public revenues for

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<sup>19</sup> Growth machines are coalitions of owners of land or buildings, developers, and organizations that serve the needs of growth machine entrepreneurs.

providing public services (Wolman and Spitzley, 1996). Groups gaining direct benefits from local growth are more likely to stimulate business growth (Feiock and Clinger, 1986; Feiock, 1989). Therefore, activities of viable pro-growth coalitions of city interests and elite groups determine the decision making processes of economic development policies.

In general, development coalitions want to cope with market changes quickly. Therefore, complicated development regulations are a barrier delaying their strategies and plans. If private developers strongly support energy conservation and climate protection efforts, local government might not need to control them because it requires high monitoring costs. As a result, as development coalitions support energy or environmental conservation more strongly, local governments will seek to relieve regulations related to efficient energy use technologies and renewable energy development. Therefore, if the developers support the energy and environmental protection efforts of local governments, local governments and private developers can form a collaborative mechanism more easily. Accordingly, local governments will provide businesses with more financial or other incentives related to efficient energy use technologies and renewable energy development.

**Support of Public Organizations.** Green economic development is an unavoidable paradigm for sustainable development. However, the transition to green economic development requires the reallocation of capital and labor resources across sectors and a careful management of the potential decline and job losses in more polluting or environmentally-damaging activities. Therefore, mediators' roles to arbitrate between private development coalitions and environmental protection coalitions are emerging as important positions. Mediators will promote synergistic compromises between stakeholders pursuing different interests in green governance mechanisms.

Traditionally, public organizations play a central role in regulating and organizing policies for economic development (Bozeman and Bretschneider, 1994; Garnett, Marlowe, and Pandey, 2008). Decision makers' support of, or opposition to, green economic development activities will significantly influence the decision making processes of incentives or regulations for green economic development. Public organizations, relative to private development organizations, are likely to have higher credibility, and thus have the authority to mediate conflicts between pro-growth organizations and anti-growth organizations. Therefore, public

organizations have the authority to make legal decisions on community development and mediate conflicts between pro- and anti- growth organizations (Lubell, et al., 2005).

If these mediator coalitions support energy conservation or climate protection for local green economic development, they will seek to more actively craft a variety of policies and incentives to encourage the development of efficient energy use technologies and renewable energy, and will apply the incentives to their local green development. Therefore, as public organizations support environmental or energy conservation policies more strongly, provision of financial or other incentives for development of efficient energy use technologies and renewable energy to businesses will be easier. Local governments will also seek to develop and revise institutional mechanisms such as regulations and decision making processes in order to provide these incentives more conveniently. Therefore, local governments will relieve regulations and provide streamlined processes to promote energy efficient technology and renewable energy development.

### **3.3.2 Green Economic Development Factors**

Green economic development involves multiple stakeholders. These stakeholders cooperate with each other to acquire common interests and reform economic development policies (Morgan, 2010). In particular, local information and knowledge related to green economic development, environmental organizations and neighborhood organizations can significantly contribute to strategic planning and policy adoption for successful green economic development. Therefore, governments and private development organizations consider these environmental protection organizations and neighborhood organizations as key participants in decision making for local economic development. Larger policy tools also directly influence the residential environment and residents' interests. Therefore, environmental protection organizations and neighborhood organizations intervene in decision making processes for green economic development. Accordingly, their roles and position in green economic development are more critical than in conventional economic development.

**Support of Environmental Protection Organizations.** Even though environmental protection groups are likely to form the core of opposition to development schemes, they also seek to incorporate environmental issues into local development policies. Therefore, the role of

these groups in green economic development will be salient. Environmental groups are likely to put environmental issues on the political agenda in order to obtain environmental benefits. These groups are more likely to monitor elected officials closely to see how they are governing on environmental issues (Kahn, 2006). These environmental protection coalitions can lobby politicians not to locate noxious facilities in their neighborhood and to strengthen pollution regulations while also seeking to attract green businesses (Wolman and Spitzley, 1996). Therefore, environmental protection coalitions have both political and policy predispositions for community environmental protection.

Incentives or infrastructure to enhance efficient energy use technologies and renewable energy development can become significant resources to attract green businesses. As the environmental protection coalitions' support on environmental or energy issues becomes stronger, local governments tend to provide businesses with more incentives to enhance energy efficient technologies and renewable energy development. In addition, local governments and environmental protection organizations will pay attention to regulatory roles for environmental protection for green economic development. Renewable energy development and energy efficient technology development can become potential alternatives related to energy consumption that can achieve synchronous environmental protection and economic development. Therefore, as environmental protection coalitions support the energy and environmental conservation plans of local governments, local governments can more easily relieve regulations for energy efficient technology development and renewable energy development.

**Support of Neighborhood Organizations.** Neighborhood organizations, referring to neighborhood associations or homeowner groups, seek to actively intervene in the decision making processes of local development initiatives. They seek to negotiate with local governments or private developers in order to protect and improve their residential environment. In addition, these neighborhood organizations' information and political predisposition can significantly influence political decision making for green economic development. Depending on their community's interests, these organizations can react to, protest against, or try to fit into the plans of governments or private developers (Turner, 1999). For example, homeowners may be opposed to economic development plans if undesirable consequences such as pollution and congestion may result from the plans (Wolman and Spitzley, 1996). These organizations will

play pivotal roles in developing their communities into an environmentally sustainable residential area. Therefore, these community organizations' roles and activities are more important in local green economic development than in conventional economic development.

In this sense, if these neighborhood organizations' support of energy conservation and climate protection efforts of local governments increases, local governments can more easily provide businesses with financial or other incentives for energy efficient technology and renewable energy development. Neighborhood organizations' support of energy conservation and climate protection efforts will provide local governments with strong motivation to develop efficient technology and alternative energy that can simultaneously realize environmental protection and sustainable and clean energy.

In addition, increasing support of these neighborhood organizations will simplify complicated processes related to energy efficient technology and renewable energy development. Complicated regulations are likely to discourage businesses' willingness to pursue efficient energy use technologies and renewable energy development. If homeowners and neighborhood organizations are more in favor of environmental and energy issues and emphasize energy conservation and climate protection, local governments will have more motivation to provide convenient mechanisms for a variety of energy efficient technology development or renewable energy development. Therefore, local governments will seek to provide streamlined processes and relieve regulations constraining energy efficient technology or renewable energy development.

## CHAPTER 4

### RESEARCH MODEL AND HYPOTHESES

#### 4.1 Research Model

This study integrates the three models explaining factors promoting local economic development activities described in chapter 3: economic pressure model, political and institutional choice model, and development/environmental coalition model. These three models usually have addressed factors promoting conventional economic development activities. However, previous studies have not verified whether or not these factors influencing conventional economic development still have the same influence on the use of policy tools for green economic development. Therefore, this study includes the factors influencing the use of policy tools for conventional economic development in its research model. Although this study concentrates on green economic development activities, both the factors derived from conventional economic development activities and the factors derived from green economic development activities are nested in each model. Besides, this study assumes the factors that previous studies have emphasized in the use of policy tools for conventional economic development also influence green economic development activities. For example, fiscal condition and economic stress will still provide motivation to promote the use of policy tools for green economic development.

The economic pressure model includes not only fiscal need, economic stress, and development competition of principal cities that are emphasized in the conventional economic development, but also involves residents' standard of living, air quality, and intergovernmental development collaboration that need to be considered significant in green economic development. The political and institutional choice model emphasizes expertise and knowledge related to green economic development and preferences of attracting green businesses, including governmental structure, administrative procedures, and administrative capacity as factors emphasized in conventional economic development. Lastly, the development/environmental coalition model

includes support of public organizations and private developers who have played pivotal roles as main actors in conventional economic development as well as support of neighborhood organizations and environmental protection organizations that are emerging as other main actors in the green economic development.

As addressed in the previous section, policy tools are examined by two dimensions: development incentives and regulatory relief. These typologies of green economic development policy tools are supported more solidly by two economic perspectives addressed previously: neo-classical economics and ecological economics.<sup>20</sup> Therefore, this study offers a matrix comprised of four types of policy tools.

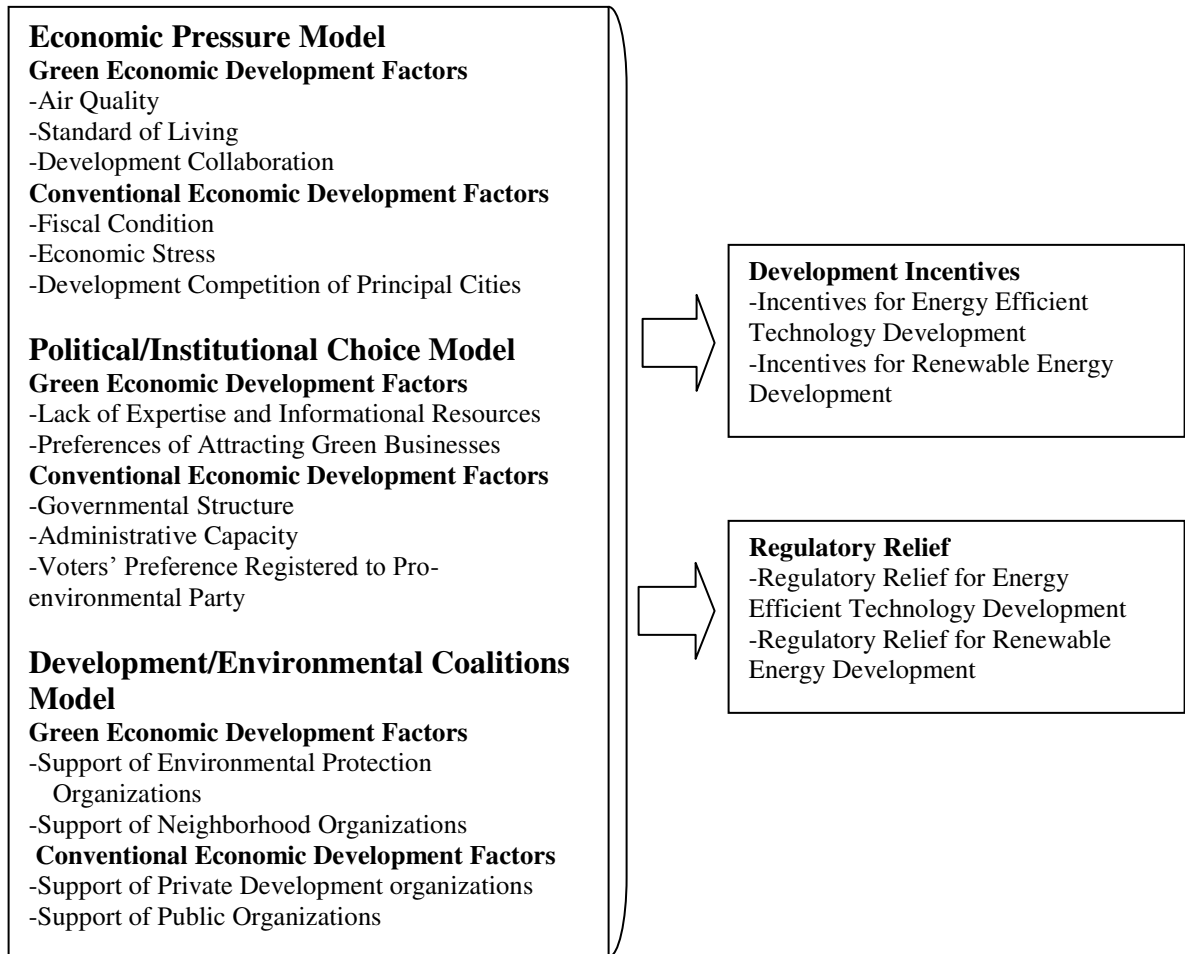
Green economic development emphasizes environmental protection, clean energy, and resource stability. Therefore, policy tools exam renewable energy and energy efficiency. Stakeholders related to local green economic development strive to increase energy efficiency and develop clean/sustainable energy for job creation and increasing the wealth of residents (Carley, et al, 2010). Accordingly, incentives and regulatory relief for energy based green economic development are derived from renewable energy development and energy efficient technology development. The research model to account for these inquiries can be seen in figure 4.1.

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<sup>20</sup> Neoclassical economists believe that economic efficiency can be achieved by technological innovation, and thus, they emphasize that for green economic development, local governments must craft incentives and regulations to enhance energy efficient technology development. On the other hand, ecological economists argue that the development values of green economy can be achieved by balance within an ecosystem. Therefore, incentives and regulations are concentrated on renewable energy/sustainable resource development that emphasizes environmental protection and natural resource stability, rather than energy efficient technologies.

## Explanatory Variables

## Dependent Variables



[Figure 4.1] The Influence of Explanatory Factors on the Use of Policy Tools for Energy Based Green Economic Development

## 4.2 Hypotheses for Green Economic Development Factors

As mentioned above, hypotheses of this study focuses on green economic development factors. Table 4.1 summarizes the hypotheses. Except for the influence of *air quality* on two policy tools of development incentives and the influence of *lack of expertise and informational resources* on four policy tools of regulatory relief and development incentives, most factors have positive impact on the policy tools.



[Table 4.1] Hypotheses of Green Economic Development Factors

<b>Policy Tools for Green Economic Development</b>				
Explanatory Variables	Development Incentives		Regulatory Relief	
	Energy efficient technology	Renewable energy	Energy efficient technology	Renewable energy
<b>Economic Pressure Model</b>				
Air Quality	-	-	+	+
Standard of Living	+	+	+	+
Development Collaboration	+	+	+	+
<b>Political/Institutional Choice Model</b>				
Lack of Expertise and Informational Resources	-	-	-	-
Preferences of Attracting Green Businesses	+	+	+	+
<b>Development/Environmental Coalition Model</b>				
Support of Environmental Protection Organizations	+	+	+	+
Support of Neighborhood Organizations	+	+	+	+

#### 4.2.1 The Influence of Economic Pressure

*Air Quality: Overall Air Quality Index.* Hospital admissions for respiratory diseases increase significantly when particulate levels in the air are high (Kahn, 2006). Therefore, high-quality human capital may move out of cities and thus the commercial market and housing value will degenerate. Accordingly, as air pollution increases, local governments will focus on developing alternatives to attract new clean businesses or retain existing green businesses. Since energy use is the main source of air pollution, local governments will seek to craft policy tools for efficient energy use and clean energy development (Marcus, 1992). Therefore, as air pollution increases, local governments may seek to provide more incentives to promote the development of energy efficient technology and renewable energy. On the other hand, if air quality is better, cities are less likely to provide financial and non financial incentives for energy efficient technology and renewable energy development to local businesses.

In addition, increasing air pollution will lead neighborhood and environmental organizations to influence their local governments in order to improve the community environment. As a result, local governments may perceive risk and uncertainty. Local governments will seek to minimize risk and uncertainty due to air pollution. Therefore, local governments might not easily relieve regulations related to the development of energy efficient technology and renewable energy. However, if the local governments have better air quality, they are less likely to perceive risk and uncertainty due to air pollution and are not sensitive to air pollution. Therefore, the willingness and effort of the local governments of controlling air pollution become weak. Therefore, local governments with better air quality are more likely to relieve a variety of environmental regulations related to the development of energy efficient technology and renewable energy. Accordingly, this study expects the following:

***H1\_1a:** Local governments with better air quality are less likely to apply financial or other incentives to encourage energy efficient technologies than cities with worse air quality.*

***H1\_1b:** Local governments with better air quality are more likely to relieve regulations or provide streamlined processes to incorporate energy efficient technologies than cities with worse air quality.*

***H1\_1c:** Local governments with better air quality are less likely to apply financial or other incentives targeted to renewable energy than cities with worse air quality.*

***H1\_1d:** Local governments with better air quality are more likely to relieve regulations or provide streamlined processes for renewable energy development than cities with worse air quality.*

***Standard of Living: Median Housing value.*** Median housing value can be directly associated with standard of living and housing conditions. Therefore, communities with high median housing value are selective about the industries they recruit and seek only clean industries in order to maintain or increase their housing value (Koven and Lyons, 2003). Median housing value of cities is likely to parallel land value in the cities. Therefore, in order to use land efficiently, cities with high median housing value will try to heighten efficiency and convenience of housing by developing and providing efficient energy use technologies and renewable energy. Accordingly, local governments with high median housing value are more likely to provide businesses with more incentives to promote the development of efficient energy use technologies and renewable energy.

Cities with high housing value might be more sensitive to the changes of their housing value or land value. They will seek to maintain or increase their property value and consequently, cities with high median housing value might prefer to stringently screen polluters, and build green development conditions and maintain green residential environment. Therefore, while cities with high median housing value make efforts to screen polluters, they will seek to apply energy efficient technology and renewable energy in their local businesses in different ways. They also will be more selective in attracting businesses and thus focus on attracting infrastructure and businesses that can apply efficient energy use technologies and renewable energy. Therefore, even though cities with high median housing value strengthen regulations related to polluters, they will relieve regulations related energy efficient technology development and renewable energy development to promote green development. Therefore, this study expects:

***H1\_2a:** Local governments with higher median housing value are more likely to apply financial or other incentives to encourage efficient energy use technologies than cities with lower median housing value.*

***H1\_2b:** Local governments with higher median housing value are more likely to relieve regulations or provide streamlined processes to integrate efficient energy technologies than cities with lower median housing value.*

***H1\_2c:** Local governments with higher median housing value are more likely to apply financial or other incentives targeted to renewable energy than cities with lower median housing value.*

***H1\_2d:** Local governments with higher median housing value are more likely to relieve regulations or provide streamlined processes for renewable energy development than cities with lower median housing value.*

***Development Collaboration: The Types of Collaborative Actions.*** Previous studies argue that intergovernmental interactions will promote cooperation with other jurisdictions for economic development (Hawkins, 2010; Carr, LeRoux, and Shrestha, 2009) because local governments can have more opportunities to share information and a variety of resources related to green economic development (Andrew, 2009; Scott and Davis, 2003; Flora and Flora, 1993; Carr, LeRoux, and Shrestha, 2009).

Collaborative actions with other local governments or agencies will encourage local governments to share and employ successful policies and initiatives crafted for green economic

development in other governments. The development of energy efficient technology and clean and sustainable energy requires a variety of knowledge and technologies related to energy resources, geographical conditions and development. As a result, human/financial capital also needs to be invested for a long time. Collaborative actions with other governments or agencies will promote these activities and efforts more efficiently. Therefore, local governments can learn strategies and techniques for more efficiently providing financial or other incentives and lowering regulatory barrier to promote the development of efficient energy use technologies and renewable energy. In addition, local governments interacting cooperatively with other governments or agencies using more varied types of collaboration will be more likely to provide businesses with more financial or other incentives and streamlined processes thus encouraging the development of efficient energy use technologies and renewable energy. Therefore, the hypotheses can be built as follow:

***H1\_3a:** Local governments with more collaboration with other governments are more likely to choose financial or other incentives for energy efficient technology than cities with less collaboration with other governments.*

***H1\_3b:** Local governments with more collaboration with other governments are more likely to relieve regulations or provide streamlined processes for energy efficient technology than cities with less collaboration with other governments.*

***H1\_3c:** Local governments with more collaboration with other governments are more likely to apply financial or other incentives targeted to renewable energy development than cities with less collaboration with other governments.*

***H1\_3d:** Local governments with more collaboration with other governments are more likely to relieve regulations or provide streamlined processes to encourage renewable energy development than cities with less collaboration with other governments.*

#### **4.2.2 The Influence of Political and Institutional Choice**

***Lack of Expertise and Informational Resources in Green Economic Development:*** ***Lack of Informational Resources and Time/Expertise.*** The lack of expertise and informational resources related to complex and unfamiliar technologies might provide opportunistic businesses with a variety of incentives to exploit local governments. Therefore, local governments are reluctant to provide businesses with development incentives.

In addition, if local governments experience substantial obstacles due to lack of expertise and information resources, they will not prefer to relieve regulations. Regulations are useful tools of which local governments take advantage to control opportunistic businesses. Since local governments lacking of informational resources and expertise are likely to perceive risk or uncertainty relatively greater than others, they will use regulatory tool promoting efficient energy use technologies and renewable energy development. Therefore, this study posits;

***H2\_1a:** Local governments lacking expertise and information resources are less likely to apply financial or other incentives to encourage efficient energy use technologies than cities with poorer expertise and fewer information resources.*

***H2\_1b:** Local governments lacking expertise and information resources are less likely to relive regulations or provide streamlined processes to incorporate efficient energy use technologies than cities with poorer expertise and fewer information resources.*

***H2\_1c:** Local governments lacking expertise and information resources are less likely to apply financial or other incentives targeted to the renewable energy than cities with poorer expertise and fewer information resources.*

***H2\_1d:** Local governments lacking expertise and information resources are less likely to relive regulations or provide streamlined processes for renewable energy development than cities with poorer expertise and fewer information resources.*

***Preferences of Attracting Green Businesses: The Importance of Attracting Green Business.*** Cities with higher recognition of the importance of attracting green businesses will prefer to attract green businesses to their jurisdictions and are likely to pay more attention to a variety of ways to attract green businesses. Stronger motivation and willingness for attracting green businesses in a local government will shape local government's positive recognition to the need to more actively develop policy tools for local green economic development. Therefore, as the recognition of the importance of attracting green businesses increases, local governments will seek to provide a variety of incentives to encourage energy efficient technology and renewable energy development.

Stringent regulations tend to be perceived as high barriers of business activities because a variety of business activities are restricted due to the regulations. In addition, for private businesses that must respond to market change quickly, time-consuming administrative processes can weaken their competitiveness. Therefore, businesses do not prefer to be located in

jurisdictions where stringent and complicated regulations are applied. Accordingly, local governments need to minimize regulatory barriers and simplify administrative processes in order to make it easier for businesses to access a variety of governmental support. Therefore, cities more strongly perceiving the need to attract green businesses are likely to relieve regulations and provide streamlined processes for energy efficient technology and renewable energy development. Accordingly, the following hypotheses are offered:

***H2\_2a:** Local governments with a stronger perception of the importance of attracting green businesses are more likely to apply financial or other incentives to encourage efficient energy use technologies than cities with a poorer perception of the importance of attracting green businesses.*

***H2\_2b:** Local governments with a stronger perception of the importance of attracting green businesses are more likely to relieve regulations or provide streamlined processes to incorporate efficient energy use technologies than cities with a poorer perception of the importance of attracting green businesses.*

***H2\_2c:** Local governments with a stronger perception of the importance of attracting green businesses are more likely to apply financial or other incentives targeted to renewable energy than cities with a poorer perception of the importance of attracting green businesses.*

***H2\_2d:** Local governments with a stronger perception of the importance of attracting green businesses are more likely to relieve regulations or provide streamlined processes for renewable energy development than cities with a poorer perception of the importance of attracting green businesses.*

#### **4.2.3 The Influence of Development/Environmental Coalitions**

***Support of Environmental Protection Organizations: Support and Opposition from Environmental groups.*** Environmental protection groups are opposed to new development. Therefore, they monitor environmental polluters within local jurisdictions and seek to maximize environmental benefits. In order to strengthen their political power, environmental groups are more likely to monitor elected officials closely to see how they are governing on environmental issues (Kahn, 2006). Therefore, environmental organizations are in favor of efforts for green economic development strategies and attempt to strengthen pollution regulations while also seeking to attract green businesses (Wolman and Spitzley, 1996).

Environmental protection groups, on the one hand, seek to control polluters and, on the other hand, attempt to promote incentives and technologies to minimize pollution factors. Energy cannot be separated from development. Renewable energy and efficient energy use technologies are critical alternatives to reduce pollution factors. Therefore, environmental protection groups will support development of efficient energy use technologies and renewable energy. Accordingly, as environmental protection organizations support the energy conservation and climate protection efforts of governments, local governments can secure stronger policy justice and reduce negotiation and administrative costs. As a result, the governments can more easily apply incentives for energy efficient technology and renewable energy development to businesses.

In addition, while environmental protection organizations seek to screen and monitor polluters, they will support policies that can reduce environmental pollution and synchronize environmental conservation and development. Support of environmental protection groups will heighten the political feasibility of local governments that implement regulatory relief to promote renewable energy and energy efficient technology development. In order to encourage business involvement in these policies, regulatory barriers must be lowered. This will make it easier for businesses to develop energy efficient technology and renewable energy. Energy use technology and renewable energy development have high uncertainty and cannot easily obtain expected results and thus require long-term financial and human investments. Therefore, as environmental organizations more strongly support the energy conservation and climate protection efforts of local governments, local governments will relieve regulations related to energy efficient technology and renewable energy development more willingly. Therefore, this study expects:

***H3\_1a:** As environmental coalitions of local governments more strongly support energy and environmental conservation, local governments are more likely to apply financial or other incentives to encourage efficient energy use technologies.*

***H3\_1b:** As environmental coalitions of local governments more strongly support energy and environmental conservation, local governments are more likely to relieve regulations or provide streamlined processes to incorporate efficient energy use technologies.*

***H3\_1c:** As environmental coalitions of local governments more strongly support energy and environmental conservation, local governments are more likely to apply financial or other incentives targeted to renewable energy.*

*H3\_1d: As environmental coalitions of local governments more strongly support energy and environmental conservation, local governments are more likely to relieve regulations or provide streamlined processes for renewable energy development.*

***Support of Neighborhood Organizations: Support or Opposition from Neighborhood/Homeowner Association.*** Neighborhood associations and homeowner groups are representative of community organizations that seek to protect and improve their residential environment. Therefore, they attempt to influence the decision making processes of local development initiatives and negotiate with local governments or private developers. These neighborhood organizations are concerned about environmental pollution, crimes, and congestion (Wolman and Spitzley, 1996). Therefore, they attempt to protect residential environment and conditions from those problems. These organizations monitor governments' policy decision making processes as well as provide useful information to governments. They also put issues influencing their interests such as environmental problems to political agenda. These political efforts can become critical evidence to support or oppose policies for green economic development. Therefore, as neighborhood or homeowner groups' support for energy conservation and climate protection efforts increases, local governments will more willingly provide local green businesses with incentives for efficient technology and renewable energy development.

In addition, support from these neighborhood organizations for energy conservation and climate protection efforts lead local governments to positively recognize these issues and heighten political feasibility and policy justice. Neighborhood associations or homeowners are also likely to support relief of complicated regulations because they also prefer to promote environmental protection and energy conservation policies that can improve residential environment as long as it does not affect property value. Therefore, increasing support of neighborhood organizations for energy conservation and climate protection efforts encourages local governments to relieve regulations for renewable energy or energy efficient technology development.

*H3\_2a: As neighborhood organizations more strongly support energy and environmental conservation, local governments are more likely to apply financial or other incentives to encourage efficient energy use technologies.*



*H3\_2b: As neighborhood organizations more strongly support energy and environmental conservation, local governments are more likely to relieve regulations or provide streamlined processes to incorporate efficient energy use technologies.*

*H3\_2c: As neighborhood organizations more strongly support energy and environmental conservation, local governments are more likely to apply financial or other incentives targeted to renewable energy.*

*H3\_2d: As neighborhood organizations more strongly support energy and environmental conservation, local governments are more likely to relieve regulations or provide streamlined processes for renewable energy development.*

### **4.3 Conventional Economic Development Factors**

This study controls for the factors considered significant in conventional economic development in order to compare them with the factors added to systematically explain green economic development activities.

#### **4.3.1 The Influence of Economic Pressure**

*Fiscal condition: Per Capita Total Revenue.* Total revenue is a fiscal resource of local governments and represents government's fiscal condition (Wolman and Spitzley, 1996). This study measures fiscal condition with per capita total revenue. Local governments with more total revenue will have more financial capacity to attract green businesses within their jurisdictions. They can provide more financial or other incentives to businesses and use greater budgets for efficient revision and implementation of regulations. Therefore, total revenue can significantly influence the use of policy tools for green economic development. This study controls for per capita total revenue to measure fiscal condition.

*Economic Stress: Unemployment Rate.* Existing studies have used the unemployment rate to measure economic stress (Wolman and Spitzley, 1996; Reese, 1991; Sharp, 1991) because this variable can be used as a determinant to anticipate local economic development activities (Sharp, 1991). Local governments of up-phase are more likely to be free from economic stress. On the other hand, local governments with high unemployment rates will focus on economic

recovery and thus seek to create jobs in different ways. Therefore, cities with high unemployment rates will seek to develop and utilize a variety of policy tools for green economic development as alternatives for economic recovery.

***Development Competition of Principal Cities: Principal Cities of Metropolitan Areas.***

Competition for local economic development of local governments promotes visible subsidies or projects (Wolman and Spitzley, 1996, Feiock and Clingermayer, 1992; Green and Fleischmann, 1991) and are particularly salient in metropolitan areas because human and financial resources are likely to be mobile among adjacent towns (Tibout, 1956). Central cities of metropolitan areas are competitive because they have essential infrastructures and larger businesses and play roles as holes of networking with a variety of businesses. Therefore, central cities of metropolitan areas will seek to develop more and make more use of green economic development policy tools.

#### **4.3.2 The Influence of Political/Institutional Choice**

***Government Structure: Mayor-council Form.*** In general, governmental structures define public officials' roles and positions in public authority and generate their political power and incentives, depending on whether the form is council-manager government or mayor-council government. Therefore, governmental structure can significantly influence the policy decision making processes related to local green economic development (Feiock, 1989; Feiock and Clingermayer, 1992). Elected officials with periodic elections will seek more to develop a variety of policy tools for green economic development.

***Administrative Capacity: Number of Staff per 1000 People.*** The number of staff of local governments can become an important determinant influencing the ability to create and implement incentives and regulations and institutional improvement for local green economic development because the human capital of local governments decide the administrative capacity to carry out these policy tools (Sullivan and Green, 1999; Sullivan, 2002). Local governments with sufficient administrative capacity will develop more green economic development policy tools and manage them efficiently.

***Voter Preference: The Percent of Voters Registered to the Democratic and the Green Party.*** In general, decision making for local economic development is likely to reflect voters'

preferences and ideology. Citizens registered as members of the Democratic or the Green Party, relative to Republicans, are likely to be in favor of environmental protection (Dunlap and Allen, 1976). Therefore, cities with a higher percent of voters registered as members of the Democratic or the Green party will prefer the adoption of green economic development policy tools. However, some experts warn that renewable energy development can cause energy sprawl (McDonald, et al., 2009) and generate negative environmental externality. For example, biomass power plants are regarded as NIMBY (Not In My Back Yard) facilities, and solar energy power plants require large land space that can physically generate a negative externalities. In addition, wind power plants tend to generate noise pollution. Therefore, even though the Democratic or the Green party is likely to be pro-environment, they may not support the use of policy tools for renewable energy development.

#### **4.3.3 The Influence of Development/Environmental Coalition**

*Support of Private Development Organizations: Support and Opposition of Private Developers.* Development organizations such as real estate developers, local businesses, and chambers of commerce might form development coalitions in order to lobby for regulation relief and to strengthen their own power in bargaining with environmental protection coalitions (Molotch, 1976; Logan and Molotch, 1987). Therefore, the extent of support or opposition of development coalitions on energy conservation and climate protection can substantially influence the decision making processes of policy tools for energy based green economic development. Increasing support of private development organizations will promote the use of green economic development policy tools.

*Support of Public Organizations: Support or Oppose of Public Organizations/ Officials.* Public organizations and decision makers play roles as main actors in mediating and controlling decision making processes for green economic development (Lubell et al., 2005). Therefore, if public agencies or officials support energy conservation or climate protection for local green economic development, local governments will more easily derive decisions to promote the development of energy efficient technology and renewable energy. Public agencies or officials inherently seek to reduce administrative costs and monitoring costs due to limited budgets.

Therefore, if public organizations support energy conservation and climate protection, they can more actively relieve regulations and provide streamlined processes to promote efficient energy use and renewable energy development.

#### **4.4 Data Measurements and Sources**

The State of Florida has appropriate conditions to study the influence of explanatory factors on the use of policy tools for green economic development. Specifically, Florida has sufficient resources for renewable energy development such as solar energy and biomass energy, and state and local governments craft numerous incentives and regulatory controls to promote energy based green economic development. Florida appropriated \$15 million in 2008 for the renewable energy and energy-efficient technologies grant program, with at least \$8 million for bio-energy projects. In addition, Florida has provided a lot of energy efficiency and conservation block grants and several renewable energy tax incentives such as renewable tax credit and renewable sales tax refunds (Florida Energy and Climate Commission, 2009). Therefore, local governments of Florida will provide appropriate physical conditions and data sets related to explanatory factors of energy based green economic development.

Data of the variables used to measure influence on the use of policy tools for energy based green economic development were collected from the 2010 Energy Sustainable Florida Communities survey, the Office of Economic and Demographic Research, City-Data, Homefacts, Census Bureau, Florida Division of Election, and the 2010 International City/County Management Association (ICMA). The 2010 Energy Sustainable Florida Communities survey was conducted on city managers or mayors of 327 cities in the state of Florida with a population greater than 1000. The explanatory variables are derived from the three models: economic pressure model, political/institutional choice model, and development/environmental coalition model. Each model consists of green economic development factors and conventional economic development factors. The measurement and sources of explanatory variables and dependent variables used in this study are summarized in the Table 4.2.

[Table 4.2] Summary of Explanatory and Dependent Variables

Variables	Measurement	Sources
<b>Dependent Variables</b>		
<b>Development Incentives</b>	Incentives for Energy efficient technology development (Use: 1, No Use: 0)	2010 Energy Sustainable Florida Communities Survey (ESFCS)
	Incentives for renewable energy development (Use: 1, No Use: 0)	2010 ESFCS (2010)
<b>Regulatory Relief for Development</b>	Regulatory relief for energy efficient technology development (Use: 1, No Use: 0)	2010 ESFCS (2010)
	Regulatory relief for renewable energy development (Use: 1, No Use: 0)	2010 ESFCS (2010)
<b>Explanatory Variables</b>		
<b>Economic Pressure Model</b>		
<b>Green Economic Development Factors</b>		
Air Quality	Overall Air Quality Grade (0 - 10)	Homefacts (2008)
Standard of Living	Median Housing value (ln)	City-Data (2009)
Development Collaboration	The Number Adopted out of Five Types of Intergovernmental Development Collaboration	2010 ESFCS (2010)
<b>Conventional Economic Development Factors</b>		
Fiscal Condition	Per Capita Total Revenue	Office of Economic and Demographic Research (2010)
Economic Stress	Unemployment Rates (square)	City-Data (2010)
Development Competition of Principal Cities	Principal Cities of Metropolitan Areas (Yes: 1, No: 0)	Census Bureau (2006)
<b>Political/Institutional Choice Model</b>		
<b>Green Economic Development Factors</b>		
Lack of Expertise on Green Economic Development	Index Merged Lack of Time/Expertise to Design and Plan and Lack of Informational Resources (1-5)	2010 ESFCS (2010)
Preference for Attracting Green Businesses	The Extent of Importance for Attracting Green Businesses(1-4)	2010 ESFCS (2010)
<b>Conventional Economic Development Factors</b>		
Governmental Structure	Mayor Council/ Others (Mayor:1, Others: 0)	ICMA (2010)
Administrative Capacity	Number of Staff per 1000 people (ln)	City-Data (2009)
Voters' Preference	Percent Registered As Member of the Democratic and the Green Party	Florida Division of Election (2006)
<b>Development/Environmental Coalition Model</b>		
<b>Green Economic Development Factors</b>		
Support of Environmental Protection Organizations	The Extent of Support or Opposition of Environmental Groups (1(opposition)-5(support))	2010 ESFCS (2010)
Support of Neighborhood Organizations	The Extent of Support or Opposition of Neighborhood Association and Homeowners Groups (1-10)	2010 ESFCS (2010)
<b>Conventional Economic Development Factors</b>		
Support of Private Development Organizations	The Extent of Support or Opposition of Chamber of Commerce, Real Estate Developers, and Local Business (1-15)	2010 ESFCS (2010)
Support of Public Organizations	The Extent of Support or Opposition of City Council/Commission (1-5)	2010 ESFCS (2010)

#### 4.4.1 Explanatory Variables

The green economic development factors of the economic pressure model consist of air quality, standard of living, and development collaboration. Air quality as measured by the 2008 air quality index is *the overall air quality grade* including carbon monoxide, ozone, PM 10, PM 2.5, sulfur dioxide, and nitrogen dioxide that are based on county jurisdictions of Florida. The overall air quality grade consists of a range from breathable (0) to outstanding (10), and a higher score is better. A higher score indicates the air has fewer pollutants. For example, if your county has a score of 9.0 that means 90% of the other stations around the country are measuring higher amounts of the pollutant than your local station. The standard of living is measured by the logged value of *median housing value of 2009*. Intergovernmental development collaboration is measured by *the number of types of collaborative actions* of the 2010 ESFCS. Collaborative actions include five types of formal and informal collaborations related to environmental and energy issues.<sup>21</sup> For conventional economic development factors of economic pressure model, this study uses *per capita total revenue* of 2010 to measure the fiscal condition of local governments. This study also measures economic stress with the *squared unemployment rate* of 2010, and measures development competition of principal cities by whether or not the cities are *principal cities of metropolitan areas* as defined by the census bureau in 2006. Principal cities of metropolitan areas are coded as “1” and others are coded as “0”.

For the political/institutional choice model, in order to measure green economic development factors, this study first uses an index combining *the extent of obstacle due to both Lack of time/expertise to design and plan and Lack of informational resources* of 2010 ESFCS to measure the expertise of local governments on green economic development activities. This replies to the question concerning the extent to which *lack of time/expertise to design and plan and lack of informational resources* obstruct your local government’s ability to reduce overall energy use. This variable is made up of a five-point scale ranging from Not an Obstacle (1) to

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<sup>21</sup> The survey question regarding collaboration for environmental issues is “Has your government engaged in any of the following collaborative actions related to land use related greenhouse gas emissions?” Five types of collaboration are Worked with other agencies or local governments in activities such as an inventory of GHG emissions, Joined a collaborative partnership with other local entities, Entered into an informal agreement with one or more local governments on energy issues, Entered into a formal agreement with one or more local governments on energy issues, and Entered changes to your comprehensive plan or other plans based on regional planning efforts.

Substantial Obstacle (5). This study measures the variable with the average of the scores of two questions mentioned. The extent of importance for attracting green businesses of the 2010 ESFCS is used to measure *preferences for attracting green businesses* and consist of a four-point scale ranging from Not Important (1) to Most Important(4). The response replies to the question: *how important is the attraction of “green business” to your jurisdiction’s economic development strategy?* Conventional economic development factors are measured by governmental structure, administrative capacity, and citizens registered to pro-environmental party. Government structure uses form of government in 2010 measured by a dichotomous variable coded as mayor-council (1) and others (0). Administrative capacity employs logged value of *number of staff per 1000 people* of 2009.<sup>22</sup> Voter preference employs the *voters’ percentage registered as member of the Democratic or the Green Party* of 2006.

Lastly, green economic development factors of development/environmental coalition model are composed of environmental protection organizations and neighborhood organizations and are measured by *the extent of opposition or support of these organizations to energy conservation and climate protection efforts*. Conventional development factors of the development/environmental coalition model consist of private development organizations and public organizations and are also measured by *the extent of opposition or support of these organizations to energy conservation and climate protection efforts*. These variables are derived from the 2010 ESFCS. The survey questions ask to *what extent the following individuals or groups would support or oppose energy conservation and climate protection efforts by your government*. The extent of opposition and support of each organization is indicated on a five-point scale ranging from Strongly Oppose (1) to Strongly Support (5). Public organizations are measured by the extent of support or opposition of *city council/commission*. Neighborhood organizations are comprised of *neighborhood associations* and *homeowner groups*, and are measured by an index made with the sum of the extent of support or opposition of these two groups. Private development organizations of conventional economic development are comprised of *chamber of commerce, real estate developers, and local businesses*, and are measured by an index made in the sum of the response of these three organizations.

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<sup>22</sup> The number of part time members is calculated as half of a full time member.

Environmental protection organizations are measured by the extent of support and opposition of *environmental groups*

#### **4.4.2 Dependent Variables**

Dependent variables representing policy tools for energy based green economic development include four variables collected from the 2010 ESFCS (*2010 Energy Sustainable Florida Communities* survey). Incentive tools for energy efficient technology development are measured with the following the survey questions: *Does your jurisdiction's economic development strategy's efforts to attract green business and industry include financial or other incentives to encourage energy efficient technologies in new development?* Regulatory relief related to energy efficient technology is measured by the following survey question: *Does your jurisdiction's economic development strategy's efforts to attract green business and industry include regulatory relief or streamlined processes for developments that incorporate energy efficient technologies?* Incentives for renewable energy development are measured by the following survey question: *Does your jurisdiction's economic development strategy's efforts to attract green business and industry include financial or other incentives specifically targeted to the renewable energy sector?* Regulatory tools related to renewable energy development also are measured with the following survey question: *Does your jurisdiction's economic development strategy's efforts to attract green business and industry include regulatory relief or streamlined processes for developments in the renewable energy sector?* Since these questions are dichotomous, cities using each policy tool are coded as "1" and others are coded as "0".

### **4.5 Data Collection, Methodology, and Estimate Procedures**

#### **4.5.1 Sample and Data Collection**

This study is based on data collected from 327 cities of Florida with a population greater than 1,000 based on 2009 estimates of population size. Surveys were distributed throughout February and April of 2010 and ended in June of 2010. Other archival data were collected throughout January to March of 2011. The response rate to the 2010 Energy Sustainable Florida



Communities survey is 50.46 % (165/327). However, variables for development incentives and regulatory relief used as dependent variables were responded to by 147 cities (44. 95%). Based on these dependent variables, this study built a data set. However, observations of some explanatory variables are missing. Managing missing data by eliminating cases with missing data will bias results if the remaining cases are not representative of the entire sample (Wayman, 2003). Therefore, this study imputes missingness of explanatory variables by multiple imputation (King et al., 2001; Honaker and King, 2010; Wayman, 2003).

Multiple imputation is intended to create an imputed data set which maintains the overall variability in the population while preserving relationships with other variables. Thus, this method seeks to preserve important characteristics of the data set as a whole such as means, variances, and regression parameters. Multiple imputation has been shown to produce unbiased parameter estimates which reflect the uncertainty associated with estimating missing data (Wayman, 2003; King et al., 2001). Further, multiple imputation has been shown to be robust to departures from normality assumptions and provides adequate results in the presence of low sample size or high rates of missing data. The first step in multiple imputation is to create values to be substituted for missingness.<sup>23</sup> The missing values are imputed linearly based on the multivariate normal specification. Thus, it creates an imputed value through the way we would usually simulate from a regression. Many empirical studies have found that it works well, especially for categorical or mixed data (King et al., 2001; Schafer 1997; Schafer and Olsen 1998). The Imputation-Posterior (IP) and Expectation-Maximization (EM) algorithms were devised and subsequently applied to data sets with missingness. IP enables us to draw random simulations from the multivariate normal observed data posterior. The EM algorithm works like IP except that random draws from the entire posterior are replaced with deterministic calculations of posterior means (King et al., 2001). Multiple imputation does this multiple times to produce multiply-imputed data sets and identifies a set of regression lines which are similar to but different from each other. These regression models are made in different versions of what in the actual equation for the missing data might be plausible, believable regression lines. It averages these versions producing a few believable versions of the data to produce better

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<sup>23</sup> King et al. (2001) discusses multiple imputation in detail. The program for missing data used in this study is AMELIA II made by James Honaker, Gray King, and Matthew Blackwell.

estimates. This study presents the data set before conducting multiple imputation and the data set after conducting multiple imputation in the section of 5.2 Descriptive Analysis.

#### 4.5.2 Methodology

This study uses a *binary logit model* to analyze the influence of explanatory factors on the use of energy based green economic development policy tools. Dependent variables relating to incentives and regulatory relief are dummy variables questioning whether or not your jurisdictions' economic development strategy includes efforts to attract green business or industry.

Binary dependent variables have two values: "0" for a negative outcome (the event did not occur) and "1" for a positive outcome (the event did occur) (Long and Freese, 2006). Several assumptions of the linear regression model necessarily need not be satisfied. This model is done by specifying a nonlinear model relating to independent variables to the probability of an event, and thus can handle nonlinear effects. Explanatory variables and dependent variables need not be normally distributed and so normally distributed error terms are not assumed. In addition, this model is available even though it has the heteroscedastic problem, and explanatory variables do not need to be interval or unbounded (Long, 1997).

However, binary logit model requires enough observations to achieve stable and meaningful results. According to previous studies, nonlinear probability model must get at least five observations per parameter. In addition, if explanatory variables are highly collinear or if there is little variation in the dependent variable, a larger sample is required (Long, 1997). In addition, an interpretative limitation is that the binary logit model just reports whether or not the events, policy tools here, have been employed but say nothing about the extent to which it has been employed (Wolman and Spitzley, 1996). Nevertheless, this model can be a powerful model if we understand well of how to convert the logit values into probabilities.

Logit model started at the problem that the Linear Probability Model can predict values of  $\Pr(y=1|x)$  that are greater than 1 or less than 0. To eliminate this problem, this model transforms  $\Pr(y=1|x)$  into a function that ranges from  $-\infty$  to  $\infty$ . The probability of the odds of observing a positive outcome versus a negative one:

$$\frac{\Pr(y=1|x)}{\Pr(y=0|x)} = \frac{\Pr(y=1|x)}{1-\Pr(y=1|x)}$$

The odds indicate how often something (e.g.,  $y=1$ ) happens relative to how often it does not happen (e.g.  $y=0$ ), and ranges from 0 when  $\Pr(y=1|x) = 0$  to  $\infty$  when  $\Pr(y=1|x) = 1$ . The log of the odds is called the *logit*, and ranges from  $-\infty$  to  $\infty$  (Long, 1997). The *logit* equation is as follows:

$$\Pr(y=1|x) = \frac{\exp(\alpha + x\beta + \delta d)}{1 + \exp(\alpha + x\beta + \delta d)}$$

( $x$  is continuous and  $d$  is binary)

The nonlinear model can be transformed to a model that is linear in some other outcome. The logit model is linear in the *logit* and the log odds are a linear combination of the  $x$ 's and  $\beta$ s. The logit model can be written as:

$$\ln\left[\frac{\Pr(y=1|x)}{1-\Pr(y=1|x)}\right] = \alpha + x\beta + \delta d$$

Based on this logit model, the results can be interpreted with methods for linear models. The logistic regression coefficients simply show the change in the predicted logged odds of experiencing an event or having a characteristic for a one-unit change in the independent variables. The coefficients are the effects of variables on changes in logged odds and thus reveal little about the relationships and do little to help explain the substantive results. The results need to be interpreted by the substantive meaning (Pampel, 2000).

Therefore, the exponent of the coefficients can be interpreted in terms of factor changes in the odds, rather than the logged odds of the dependent variables (Long and Freese, 2006). Therefore, coefficients are interpreted by odds indicating that for a unit change in  $x_k$ , we expect the logit to change by  $\beta_k$ , holding all other variable constant. The odds are as follows:

$$\text{Odds (Y=1)} = e^{Y = \alpha + x\beta + \delta d}$$

The marginal effect can also be shown by the tangent to the probability curve and is computed with the marginal change for each observation in the sample and then is averaged over all values.

$$\text{Marginal effect} = \frac{\partial \text{Pr}(y=1|x)}{\partial x_k}$$

Marginal effects can report marginal changes of the predicted probability/rate with respect to a given independent variable. Therefore, this study reports Coefficient, Odd Ratio, and Marginal Effect.

#### 4.5.3 Estimate Procedures

Since the dependent variables used in this study are responses by 147 cities in the State of Florida but some variables have missingness, this study first imputes the observations of 147 cities with missingness by multiple imputation and analyzes correlations among potential proxies to measure explanatory factors. According to the results, *median housing value, median household income, per capita income, percentage of persons 25 years and over with bachelor's degree or higher, percentage of graduate and professional degree, and percentage of residents living in poverty* indicates a high correlation value of greater than 0.5. Median household income, median housing value, and per capita income are useful variables to measure residents' standard of living. Since median housing value is the most fitted proxy to measure income level, this study uses median housing value to measure standard of living. Even though proxies related to education and poverty also are important community variables, these variables are excluded because of high correlations compared with standard of living.

Population size, land size, principal cities of metropolitan areas, and cities receiving energy efficient and conservation block grants (EECBG) also show high correlation of greater than 0.5. Even though population size and land size are critical physical characteristics, this study excludes these two variables because the principal cities of metropolitan areas are used as an important variable to measure development competition of principal cities. The EECBG variable can influence the financial condition of local governments. However, since this study uses per capita total revenue to measure fiscal condition and the EECBG variable indicates high correlation, compared with land size and population size, the EECBG variable is excluded from the model of this study. In addition, the private development organization variable indicates high correlations of 0.62 and 0.57, respectively, compared with neighborhood organization and public organization variables. However, private development organizations theoretically need to be

separated from public organizations and neighborhood organizations because their preferences and strategies related to green economic development are different as stated in chapter 3. This study also ran factor analysis to determine how these variables are grouped. The result shows neighborhood organizations and environmental protection organizations need to be separated. Therefore, this study uses environmental protection, neighborhood, private development, and public organization variables each as an independent variable. Correlations among the independent variables selected for this study are reported in Appendix 1.

After checking correlations among the explanatory variables, this study attempts to operationalize each variable to make them distribute normally and thus reduce multicollinearity even though explanatory variables do not need to be distributed normally in a binary logit model. Median housing value and the number of per capital staff were used by logged value and unemployment rate was measured by square value. Even though operationalization of these variables changes the magnitude of the change of variables, they do not cause direction and critical changes of interpretation.

The standard coefficient of determination defined as  $R^2$  in general is presented in Pseudo- $R^2$  in Binary logit model. However, the value cannot indicate the exact value of model fit of binary logit model. Therefore, this study presents Count  $R^2$ . Count  $R^2$  is the proportion of correct predictions. The formula of Count  $R^2$  is as follows:

$$\text{Count } R^2 = \frac{1}{N} \sum_j n_{jj}$$

Next chapter first describes the demographic characteristics of responding municipalities and descriptively analyzes the explanatory and dependent variables. Then, depending on each dependent variable, this study reports the findings of each dependent variable individually in chapter on findings. Next, in the discussion chapter, this study comparatively explains the differences between development incentives and regulatory relief, the differences between energy efficient technology development and renewable energy development, and lastly the four dependent variables together. Each comparative analysis also comparatively discusses the three models that explain factors promoting economic development activities and the differences between the factors that significantly influence conventional economic development and factors added to explain green economic development.

# CHAPTER 5

## FINDINGS

### 5.1 The Demographic Characteristics

This study first reports the demographic characteristics of the responding cities, compared with the sampled 327 cities of Florida. The cities of the State Florida sampled for this study are cities with a population greater than 1,000. Of the sampled cities in the State of Florida, 72.8% have a population fewer than 25,000 and 63.3% in the responding cities have a population fewer than 25,000. The percent of cities with a population between 25,000 and 50,000 cities is 11.6% of the sampled cities and the percent of responding cities in this range is 14.3%. In addition, cities with a population between 50,000 and 100,000 are 10.1% of the sampled cities and the percent of responding cities is 12.9%. The percent of sampled cities with a population greater than 100,000 is 5.5 % and 9.5% in responding cities have a population greater than 100,000. The results show that Florida has many cities with small populations and the responding cities had larger population size than the sampled cities. The population density of the sampled cities is 2,954 people (per square mile) and the population density of the responding cities is 2,793 people. According to these result, the population density of the sampled cities was higher than of the responding cities.

In the sampled cities of Florida, 14.9 % lived in poverty in 2009, and in the responding cities, 14.3 % of residents lived in poverty in 2009. For education level, 25.4 % of the population age 25 and over in the sampled cities had bachelor's degree or higher in 2009, and 25.7% of the population age 25 and over in the responding cities. Poverty levels and education levels of sampled cities and responding cities were similar to each other. Lastly, the median household income of sampled cities in Florida was \$45,496 in 2009 and \$46,661 in 2009 in the responding cities. The median household income of the sampled cities was higher lower than that of the responding cities. Even though there are some differences between the sampled cities and the

responding cities, generally they exhibit similar demographic characteristics. The demographic characteristics are reported in Table 5.1.

**[Table 5.1] The Demographic Characteristics of Florida Cities**

	<b>Sampled cities of more than population 1000 (n=327)</b>	<b>Responding cities of more than population 1000 (n=147)</b>
Population less than 25,000	72.8% (2010)	63.3% (2010)
Population 25000 – 50,000	11.6% (2010)	14.3% (2010)
Population 50000 – 100,000	10.1% (2010)	12.9% (2010)
Population greater than 100,000	5.5% (2010)	9.5% (2010)
Population density (people per square mile)	2,954 (2010)	2,793 (2010)
Percentage of residents living in poverty	14.9% (2009)	14.3% (2009)
Percentage of Persons 25 Years and Over with Bachelor's Degree or Higher	25.4% (2009)	25.7% (2009)
Median household income	\$ 45,540 (2009)	\$ 46,661 (2009)

## 5.2 Descriptive Analyses

Policy tools for this study are categorized into incentives and regulatory relief for green economic development. For development incentives, 12.93% of responding cities use incentives for energy efficient technology development, and 87.07% of cities do not use the policy tool. In addition, 14.97% of cities use incentives for renewable energy development, and 85.03% cities do not use the policy tool. Therefore, this study identifies that many cities of Florida currently do not use incentives for energy efficient technology or renewable energy development. The frequency and percent are indicated in Table 5.2.

**[Table 5.2] Description of Development Incentives**

<b>Policy Tools</b>		<b>Freq.</b>	<b>Percent</b>	<b>Policy Tools</b>		<b>Freq.</b>	<b>Percent</b>
Incentives for Energy Efficient Technology Development	Use	19	12.93	Incentives for Renewable Energy Development	Use	22	14.97
	No use	128	87.07		No use	125	85.03
	Total	147	100.00		Total	147	100.00

For regulatory relief, 21.77% of the responding cities use regulatory relief for energy efficient technology, and 78.23% of the cities do not use the policy tool. In addition, 20.41% of the cities use regulatory relief for renewable energy development and 79.59% of the cities do not use the policy tool. According to survey results, even though responding cities use more regulatory relief than incentives for green economic development, many cities in Florida currently do not use regulatory relief for energy efficient technology or renewable energy development. The results are presented in the Table 5.3.

**[Table 5.3] Description of Regulatory Relief**

<b>Policy Tools</b>		<b>Freq.</b>	<b>Percent</b>	<b>Policy Tools</b>		<b>Freq.</b>	<b>Percent</b>
Regulatory Relief for Energy Efficient Technology	Use	32	21.77	Regulatory Relief for Renewable Energy Development	Use	30	20.41
	No use	115	78.23		No use	117	79.59
	Total	147	100.00		Total	147	100.00

This study also descriptively identifies basic information of explanatory and dependent variables. This study first identifies the data set before conducting a multiple imputation method to impute missingness, compared with the data set after conducting the multiple imputation method. Table 5.4 presents the results. According to the results, variables of the development/environmental coalition model present a lot of missing data, and development collaboration also has sixteen missingnesses. However, other variables have no missing or have less than ten missingnesses.



[Table 5.4] Descriptive Analyses of Explanatory and Dependent Variables with Missingness

Variables	Measurement	Number of Obs.	Mean	Std. Dev.	Min.	Max.
<b>Dependent Variables</b>						
<b>Development Incentives</b>	Incentives for energy efficient technology development	147/147	0.13	0.34	0	1
	Incentives for renewable energy development	147/147	0.15	0.36	0	1
<b>Regulatory Relief for Developemnt</b>	Regulatory relief for energy efficient technology development	147/147	0.22	0.41	0	1
	Regulatory relief for renewable energy development	147/147	0.20	0.40	0	1
<b>Explanatory Variables</b>						
<b>Economic Pressure Model</b>						
<b>Green Economic Development Factors</b>						
Air Quality	Overall Air Quality Grade	147/147	8.19	1.72	2.4	9.9
Standard of Living	Median Housing value (ln)	143/147	12.12	0.55	10.21	13.56
Development Collaboration	The Number of Intergovernmental Development Collaboration Type	131/147	0.55	1.02	0	5
<b>Conventional Economic Development Factors</b>						
Fiscal condition	Per capita Total Revenue	137/147	2458.62	1477.46	658.07	7758.7
Economic Stress	Unemployment Rates (square)	143/147	127.70	34.50	62.41	243.36
Development Competition of Principal Cities	Principal Cities of Metropolitan Areas	147/147	0.28	0.45	0	1
<b>Political/Institutional Choice Model</b>						
<b>Green Economic Development Factors</b>						
Lack of Expertise on Green Economic Development	Index Merged Lack of Time/Expertise to Design and Plan and Lack of Informational Resources	138/147	2.98	1.17	1	5
Preference for Attracting Green Businesses	The Extent of Importance of Attracting Green Businesses	147/147	2.11	0.81	1	4
<b>Conventional Economic Development Factors</b>						
Governmental Structure	Mayor Council/ Others	147/147	0.19	0.39	0	1
Administrative Capacity	Number of Staff per 1000 people (ln)	143/147	2.36	0.53	0.14	3.7
Voters' Preference	Percent registered in the Democratic and the Green Party	147/147	39.79	15.46	0	95.5
<b>Development/Environmental Coalition Model</b>						
<b>Green Economic Development Factors</b>						
Support of Environmental Protection Organizatoins	Environmental Groups	113/147	4.64	0.64	3	5
Support of Neighborhood Organizations	Index Merged Neighborhood Association and Homeowners Groups	110/147	6.95	1.73	4	10
<b>Conventional Economic Development Factors</b>						
Support of Private Development Organizations	Index Merged Chamber of Commerce, Real Estate Developers, and Local Business	106/147	10.04	2.33	5	15
Support of Public Organizations	City Council/Commission	117/147	3.91	0.90	1	5

Analyses of the data set after conducting multiple imputation are reported in Table 5.5. Comparison of the data set before conducting multiple imputation with the data set after conducting multiple imputation exhibits a couple of differences and something in common. Even though variables of the development/environmental coalition model have a lot of missing data, the data set after conducting multiple imputation has similar characteristics to the data set before conducting multiple imputation. However, maximum value of per capita total revenue (\$25,225.08) of the data set created by multiple imputation shows some difference from the data set before conducting multiple imputation. Even though the per capita total revenue has an outlier due to one city (city of Umatilla, \$25,225.08), it is normally distributed. However, the means of per capita total revenue between the two data sets does not show a large difference, and the mean (\$ 2,602.86) of per capita total revenue of imputed data is also slightly higher than its median (\$2,028.45).

For dependent variables, since many cities do not use incentives and regulatory relief for green economic development, the means of policy tool used are far lower than the medians of the policy tool use. Unique findings of the descriptive analyses are found in the environmental condition. Cities of Florida have good overall air quality as the mean is 8.19 in a range of 0 to 10. On the other hand, the collaborative actions related to green gas emissions are not active as the mean is just 0.56 in a range of 0 to 5. In other words, almost all cities do not collaboratively develop a variety of policies for greenhouse gas emissions.

[Table 5.5] Descriptive Analyses of Explanatory and Dependent Variables

Variables(N =147)	Measurement	Mean	Std. Dev.	Min.	Max.
<b>Dependent Variables</b>					
<b>Development Incentives</b>	Incentives for Energy efficient technology development	0.13	0.34	0	1
	Incentives for renewable energy development	0.15	0.36	0	1
<b>Regulatory Relief for Developemnt</b>	Regulatory relief for energy efficient technology	0.22	0.41	0	1
	Regulatory relief for renewable energy development	0.20	0.40	0	1
<b>Explanatory Variables</b>					
<b>Economic Pressure Model</b>					
<b>Green Economic Development Factors</b>					
Air Quality	Overall Air Quality Grade	8.19	1.72	2.4	9.9
Standard of Living	Median Housing value (ln)	12.12	0.57	10.21	13.56
Development Collaboration	Intergovernmental Development Collaboration	0.56	1.03	0	5
<b>Conventional Economic Development Factors</b>					
Fiscal condition	Per capita Total Revenue	2602.86	2367.60	658.07	25225.08
Economic Stress	Unemployment Rates (square)	127.63	34.43	62.41	243.36
Development Competition of Principal Cities	Principal Cities of Metropolitan Areas	0.28	0.45	0	1
<b>Political/Institutional Choice Model</b>					
<b>Green Economic Development Factors</b>					
Lack of Expertise on Green Economic Development	Index Merged Lack of Time/Expertise to Design and Plan and Lack of Informational Resources	2.97	1.17	1	5
Preference for Attracting Green Businesses	The Extent of Importance of Attracting Green Businesses	2.11	0.81	1	4
<b>Conventional Economic Development Factors</b>					
Governmental Structure	Mayor Council/Others	0.19	0.39	0	1
Administrative Capacity	Number of Staff per 1000 people (ln)	2.43	0.60	0	3.89
Voters' Preference	Percent registered in the Democratic and the Green party	39.79	15.46	0	95.5
<b>Development/Environmental Coalition Model</b>					
<b>Green Economic Development Factors</b>					
Support of Environmental Protection Organizatoins	Environmental Groups	4.53	0.73	3	5
Support of Neighborhood Organizations	Index Merged Neighborhood Association and Homeowners	7.17	1.51	4	10
<b>Conventional Economic Development Factors</b>					
Support of Private Development Organizations	Index Merged Chamber of Commerce, Real Estate Developers, and Local Business	10.07	2.45	5	15
Support of Public Organizations	City Council/Commission	3.82	1.03	1	5

When the unemployment rate taken by square (127.63) is recalculated by the original value, cities of Florida had a high unemployment rate at 2010 with a mean of about 11.3 %. In addition, the results report many responding cities are cities in suburban or rural areas, rather than principal cities of metropolitan areas.

Responding cities feeling some obstacle because of lack of time/expertise to design and plan and information resources have a mean of 2.97. The cities that consider attraction of green businesses as a somewhat important strategy have a mean of 2.11. In addition, many responding cities have governmental structures of council-manager or commission form, rather than mayor-council form. When the logged value (2.43) of the mean of governmental staff per 1000 people is recalculated to the original value, the number of staff per 1,000 citizens is 12. Of the voters registered in Florida, 39.79% are registered as members of the Democratic or the Green party.

Lastly, while environmental organizations strongly support energy conservation and climate protection efforts of governments, other organizations neutrally or moderately support these efforts of governments.

## **5.3 Analytic Results**

This section presents analytical results derived from the four models, respectively. Specifically, the results reveal the influences of explanatory factors on incentives for energy efficient technology development and renewable energy development and regulatory reliefs for these two development plans.

### **5.3.1 Results of Development Incentives**

*Incentives for Energy Efficient Technology Development.* The influence of explanatory factors on incentives for energy efficient technology development exhibits good fit with LR  $\chi^2$  (15), 29.19 and Count  $R^2$ , 0.884, and reveals that three factors are statistically significant. The results are presented in the Table 5.6.

[Table 5.6] Incentives for Energy Efficient Technology Development

Explanatory Variables	Coefficient (Std. Err.)	Odds Ratios (Std. Err.)	Marginal Effects
<b>Economic Pressure Model</b>			
<b>Green Economic Development Factors</b>			
Air Quality	0.11 (0.22)	1.12 (0.24)	0.01
Standard of Living	0.20 (0.76)	1.22 (0.92)	0.01
Development Collaboration	0.27 (0.26)	1.32 (0.34)	0.02
<b>Conventional Economic Development Factors</b>			
Fiscal condition	-0.00 (0.00)	1.00 (0.00)	-0.00
Economic Stress	0.00 (0.01)	1.00 (0.01)	0.00
Development Competition of Principal Cities	0.01 (0.72)	1.01 (0.72)	0.00
<b>Political/Institutional Choice Model</b>			
<b>Green Economic Development Factors</b>			
Lack of Expertise on Green Economic Development	-0.30 (0.32)	0.74 (0.24)	-0.02
Preference for Attracting Green Businesses	<b>0.78*</b> <b>(0.40)</b>	<b>2.18</b> <b>(0.88)</b>	<b>0.04</b>
<b>Conventional Economic Development Factors</b>			
Governmental Structure	-0.67 (0.83)	0.51 (0.43)	-0.04
Administrative Capacity	<b>1.62**</b> <b>(0.76)</b>	<b>5.06</b> <b>(3.86)</b>	<b>0.09</b>
Voters' Preference	-0.02 (0.02)	0.98 (0.02)	-0.00
<b>Development/Environmental Coalition Model</b>			
<b>Green Economic Development Factors</b>			
Support of Environmental Protection Organizations	-0.58 (0.47)	0.56 (0.26)	-0.03
Support of Neighborhood Organizations	<b>0.65**</b> <b>(0.32)</b>	<b>1.92</b> <b>(0.62)</b>	<b>0.04</b>
<b>Conventional Economic Development Factors</b>			
Support of Private Development Organizations	0.20 (0.21)	1.22 (0.26)	0.01
Support of Public Organizations	-0.54 (0.42)	0.58 (0.24)	-0.03
<i>_Cons</i>	-12.02 (11.60)		
Number of Obs. = 147			
LR chi2(15) = 29.19			
Prob > chi2 = 0.0152			
Count R2 = 0.884			

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Coefficients are Unstandardized coefficients with standard errors in parentheses.

This study could not find statistically significant variables from factors employed by the economic pressure model. *Air quality*, *standard of living*, and *development collaboration* that were employed to measure green economic development factors are not statistically significant.

In addition, *fiscal condition*, *economic stress*, and *development competition of principal cities* that were employed as conventional economic development factors also are not statistically significant.

For the political/institutional choice model, *preference for attracting green businesses* that was employed to measure green economic development factors is statistically significant and has a positive influence on the use of incentives for energy efficient technology development. Specifically, as local governments perceive the attraction of green businesses as more important in the range of four categories from *not important* to *most important*, the odds of the incentives for energy efficient technology development are 2.18 times larger, holding all other variables constant. In other words, as local governments perceive the attraction of green businesses as more important, the probability to use incentives for energy efficient technology development increases 0.04. The political/institutional choice model also shows that *administrative capacity* that was employed to measure the influence of conventional economic development factors is statistically significant and has a positive influence on use of the incentive policy tool. Specifically, as a unit in the logged value of per capita staff increases, local governments are likely to use the incentives for energy efficient technology development 5.06 times more. In other words, as local governments have per capita staff with logged value a unit more, the probability to use incentives for energy efficient technology development increases 0.09. However, *lack of expertise on green economic development* of green economic development factors and *government structure* and *voters registered to pro-environmental party* of conventional economic development factors are not statistically significant.

For the development/environmental coalition model, *support of neighborhood organizations* of green economic development factors is statistically significant and has also a positive influence on the use of incentives for energy efficient technology development. As more neighborhood organizations support energy conservation and climate protection efforts by their governments, local governments are likely to use the incentives for energy efficient technology development 2.18 times more, holding all other variables constant. In other words, as local governments strongly support energy conservation and climate protection efforts by their local governments a unit more, the probability to use incentives for energy efficient technology development increases 0.04. However, *support of environmental protection organizations* of

green economic development factors and *support of private development organizations* and *public organizations* of conventional economic development factors are not statistically significant.

***Incentives for Renewable Energy Development.*** As presented in the Table 5.7, the influences on incentives for renewable energy development show good fit with LR chi2 (15), 33.88 and Count  $R^2$ , 0.857.

First, for the economic pressure model, no variable of the model is statistically significant in explaining the influence of explanatory factors on the use of incentives for renewable energy development. Specifically, *air quality*, *standard of living*, and *development collaboration* of green economic development factors and *fiscal condition*, *economic stress*, and *development competition of principal cities* of conventional economic development factors are not statistically significant.

However, for the political/institutional choice model, there are three factors that are statistically significant. First, *preference of attracting green businesses* of green economic development factors is statistically significant and has a positive influence on the use of incentives for renewable energy development. As local governments perceive the attraction of green businesses as more important in the range of four categories from not important to most important, they use incentives for renewable energy development 2.76 times more, holding all other variables constant. In other words, as local governments perceive the importance of attraction of green businesses a unit more, the probability to use incentives for renewable energy development increases 0.06.

[Table 5.7] Incentives for Renewable Energy Development

Explanatory Variables	Coefficient (Std. Err.)	Odds Ratios (Std. Err.)	Marginal Effects
<b>Economic Pressure Model</b>			
<b>Green Economic Development Factors</b>			
Air Quality	0.40 (0.25)	1.49 (0.37)	0.02
Standard of Living	-1.02 (0.75)	0.36 (0.27)	-0.06
Development Collaboration	0.03 (0.25)	1.03 (0.26)	0.00
<b>Conventional Economic Development Factors</b>			
Fiscal condition	-0.00 (0.00)	1.00 (0.00)	-0.00
Economic Stress	-0.00 (0.01)	1.00 (0.01)	-0.00
Development Competition of Principal Cities	-0.31 (0.69)	0.74 (0.51)	-0.02
<b>Political/Institutional Choice Model</b>			
<b>Green Economic Development Factors</b>			
Lack of Expertise on Green Economic Development	-0.40 (0.32)	0.67 (0.21)	-0.02
Preference for Attracting Green Businesses	<b>1.02**</b> <b>(0.41)</b>	<b>2.76</b> <b>(1.12)</b>	<b>0.06</b>
<b>Conventional Economic Development Factors</b>			
Governmental Structure	-1.12 (0.82)	0.33 (0.27)	-0.06
Administrative Capacity	<b>0.98*</b> <b>(0.58)</b>	<b>2.67</b> <b>(1.55)</b>	<b>0.05</b>
Voters' Preference	<b>-0.05**</b> <b>(0.02)</b>	<b>0.95</b> <b>(0.02)</b>	<b>-0.00</b>
<b>Development/Environmental Coalition Model</b>			
<b>Green Economic Development Factors</b>			
Support of Environmental Protection Organizations	-0.45 (0.49)	0.64 (0.31)	-0.03
Support of Neighborhood Organizations	<b>0.67**</b> <b>(0.33)</b>	<b>1.96</b> <b>(0.64)</b>	<b>0.04</b>
<b>Conventional Economic Development Factors</b>			
Support of Private Development Organizations	-0.00 (0.18)	1.00 (0.18)	-0.00
Support of Public Organizations	0.32 (0.44)	1.38 (0.60)	0.02
<i>_Cons</i>	2.08 (10.92)		
Number of Obs. = 147			
LR chi2(15) = 33.38			
Prob > chi2 = 0.0042			
Count R2 = 0.857			

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Coefficients are Unstandardized coefficients with standard errors in parentheses.

In addition, *administrative capacity* and *voters registered to pro-environmental party* that were employed to measure the influence of conventional economic development factors are



statistically significant. However, while administrative capacity has a positive influence on the use of incentives for renewable energy development, voters' party preference has a negative influence on it. Specifically, as a unit in the logged value of per capita staff increases, local governments are likely to use the incentives for renewable energy development 2.67 times more, holding all other variables constant. In other words, as local governments have per capita staff with logged value a unit more, the probability to use incentives for renewable energy development increases 0.05. Voters' party preference reveals that as a unit of voters' percent registered as a member of the Democratic or the Green Party increases, local governments are likely to use incentives for renewable energy development 0.95 times less, holding all other variables constant. In addition, even though the marginal effect of voters' party preference has a negative direction, it is extremely small. However, *lack of expertise on green economic development* of green economic development factors and *governmental structure* of conventional economic development factors are not statistically significant.

For the development/environmental coalition model, *support of neighborhood organizations* of green economic development factors is statistically significant and has also a positive influence on the use of incentives for renewable energy development. As more neighborhood organizations support energy conservation and climate protection efforts by their governments, local governments are likely to use incentives for renewable energy development 1.96 times more, holding all other variables constant. In other words, as neighborhood organizations strongly support energy conservation and climate protection efforts by their local governments a unit more, the probability to use incentives for renewable energy development increases 0.04. However, *support of environmental protection organizations* of green economic development factors and *support of private development organizations* and *support of public organizations* of conventional economic development factors are not statistically significant.

### **5.3.2 Results of Regulatory Relief**

***Regulatory Relief for Energy Efficient Technology Development.*** The model explaining the influences of explanatory factors on regulatory relief for energy efficient technology

development exhibit good fit with LR chi2 (15), 54.71 and Count  $R^2$ , 0.857. The results are exhibited in the Table 5.8.

For the economic pressure model, *standard of living* and *development collaboration* of green economic development factors and *economic stress* and *development competition of principal cities* of conventional economic development factors are statistically significant and have positive influences on the use of regulatory relief for energy efficient technology development. As a unit of *median housing value* with logged value increases, local governments are likely to use incentives for energy efficient technology development 4.97 times more, holding all other variables constant. In other words, as median housing value with logged value of local governments increases a unit more, the probability to use regulatory relief for energy efficient technology development increases 0.15. In addition, as a unit of development collaboration types of local government increases, local governments are likely to use regulatory relief for energy efficient technology development 1.63 times more, holding all other variables constant. That is to say, as the types of development collaboration increase a unit more, the probability to use regulatory relief for energy efficient technology development increases 0.04.

For economic stress of conventional economic development factors, as a unit of *unemployment rate* taken by square increases, local governments are likely to use regulatory relief for energy efficient technology development 1.01 times more, holding all other variables constant. Therefore, the marginal effect of this factor is extremely small even though it has statistically positive influence. Lastly, for the development competition of principal cities of this model, principal cities of metropolitan areas are 2.81 times more likely to use regulatory relief for energy efficient technology development than other cities, holding all other variables constant. That is to say, the probability of using regulatory relief for energy efficient technology development of principal cities in metropolitan areas is 0.10 higher than others. However, *air quality* of green economic development factors and *fiscal condition* of conventional economic development factors are not statistically significant.

[Table 5.8] Regulatory Relief for Energy Efficient Technology Development

Explanatory Variables	Coefficient (Std. Err.)	Odds Ratios (Std. Err.)	Marginal Effects
<b>Economic Pressure Model</b>			
<b>Green Economic Development Factors</b>			
Air Quality	0.01 (0.19)	1.01 (0.19)	0.00
Standard of Living	<b>1.60**</b> <b>(0.69)</b>	<b>4.97</b> <b>(3.41)</b>	<b>0.15</b>
Development Collaboration	<b>0.49*</b> <b>(0.26)</b>	<b>1.63</b> <b>(0.42)</b>	<b>0.04</b>
<b>Conventional Economic Development Factors</b>			
Fiscal condition	-0.00 (0.00)	1.00 (0.00)	-0.00
Economic Stress	<b>0.01*</b> <b>(0.01)</b>	<b>1.01</b> <b>(0.01)</b>	<b>0.00</b>
Development Competition of Principal Cities	<b>1.03*</b> <b>(0.63)</b>	<b>2.81</b> <b>(1.76)</b>	<b>0.10</b>
<b>Political/Institutional Choice Model</b>			
<b>Green Economic Development Factors</b>			
Lack of Expertise on Green Economic Development	-0.15 (0.29)	0.86 (0.25)	-0.01
Preference for Attracting Green Businesses	<b>1.30***</b> <b>(0.41)</b>	<b>3.67</b> <b>(1.51)</b>	<b>0.12</b>
<b>Conventional Economic Development Factors</b>			
Governmental Structure	-0.46 (0.76)	0.63 (0.48)	-0.04
Administrative Capacity	0.81 (0.59)	2.26 (1.34)	0.08
Voters' Preference	-0.01 (0.02)	0.99 (0.02)	-0.00
<b>Development/Environmental Coalition Model</b>			
<b>Green Economic Development Factors</b>			
Support of Environmental Protection Organizations	0.15 (0.43)	1.16 (0.50)	0.01
Support of Neighborhood Organizations	-0.25 (0.27)	0.78 (0.21)	-0.02
<b>Conventional Economic Development Factors</b>			
Support of Private Development Organizations	<b>0.52**</b> <b>(0.20)</b>	<b>1.69</b> <b>(0.35)</b>	<b>0.05</b>
Support of Public Organizations	-0.14 (0.39)	0.87 (0.34)	-0.01
<i>_Cons</i>	-31.04 (11.22)		
Number of Obs. = 147			
LR chi2(15) = 54.71			
Prob > chi2 = 0.0000			
Count R2 = 0.857			

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Coefficients are Unstandardized coefficients with standard errors in parentheses.

In addition, for the political/institutional choice model, *preference of attracting green businesses* is statistically significant and has a positive influence on the use of regulatory relief for energy efficient technology development. Specifically, as local governments perceive attraction of green businesses more importantly, they are likely to use regulatory relief for energy efficient technology development 3.67 times more, holding all other variables constant. In other words, as local governments perceive the importance of attracting green businesses a unit more, the probability of using regulatory relief for energy efficient technology development increases 0.12. However, other variables of this model are not statistically significant. Specifically, *lack of expertise on green economic development* of green economic development factors and *government structure, administrative capacity, and voters registered to pro-environmental party* of conventional economic development factors are not statistically significant.

Finally, for the development/environmental coalition model, *support of private development organizations* employed to explain conventional economic development factors is statistically significant and has a positive influence on the use of regulatory relief for energy efficient technology development. As private development organizations increasingly support energy conservation and climate protection efforts by their governments, local governments are likely to use the regulatory relief for energy efficient technology development 1.69 times more, holding all other variables constant. In other words, as local governments strongly support energy conservation and climate protection efforts by their local governments a unit more, the probability of using regulatory relief for energy efficient technology development increases 0.05. However, *support of environmental protection organizations* and *neighborhood organizations* of green economic development factors and *support of public organizations* of conventional economic development factors are not statistically significant.

***Regulatory Relief for Renewable Energy Development.*** As seen in table 5.9, the influences of explanatory factors on regulatory relief for renewable energy development indicate good fit with LR chi2 (15), 55.48 and Count  $R^2$ , 0.823.

[Table 5.9] Regulatory Relief for Renewable Energy Development

Explanatory Variables	Coefficient (Std. Err.)	Odds Ratios (Std. Err.)	Marginal Effects
<b>Economic Pressure Model</b>			
<b>Green Economic Development Factors</b>			
Air Quality	-0.03 (0.18)	0.97 (0.17)	-0.00
Standard of Living	-0.03 (0.69)	0.97 (0.67)	-0.00
Development Collaboration	0.34 (0.25)	1.41 (0.35)	0.03
<b>Conventional Economic Development Factors</b>			
Fiscal condition	-0.00 (0.00)	1.00 (0.00)	-0.00
Economic Stress	-0.01 (0.01)	1.01 (0.01)	0.00
Development Competition of Principal Cities	0.64 (0.61)	1.89 (1.15)	0.05
<b>Political/Institutional Choice Model</b>			
<b>Green Economic Development Factors</b>			
Lack of Expertise on Green Economic Development	0.11 (0.31)	1.11 (0.35)	0.01
Preference for Attracting Green Businesses	<b>1.24***</b> <b>(0.40)</b>	<b>3.45</b> <b>(1.37)</b>	<b>0.10</b>
<b>Conventional Economic Development Factors</b>			
Governmental Structure	-0.33 (0.77)	0.72 (0.55)	-0.03
Administrative Capacity	0.85 (0.61)	2.34 (1.44)	0.07
Voters' Preference	<b>-0.04*</b> <b>(0.02)</b>	<b>0.96</b> <b>(0.02)</b>	<b>-0.00</b>
<b>Development/Environmental Coalition Model</b>			
<b>Green Economic Development Factors</b>			
Support of Environmental Protection Organizations	<b>1.29**</b> <b>(0.59)</b>	<b>3.62</b> <b>(2.12)</b>	<b>0.10</b>
Support of Neighborhood Organizations	-0.23 (0.30)	0.80 (0.24)	-0.02
<b>Conventional Economic Development Factors</b>			
Support of Private Development Organizations	<b>0.53**</b> <b>(0.21)</b>	<b>1.69</b> <b>(0.36)</b>	0.04
Support of Public Organizations	-0.01 (0.41)	0.99 (0.41)	-0.00
<i>_Cons</i>	-15.87 (11.00)		
Number of Obs. = 147			
LR chi2(15) = 55.48			
Prob > chi2 = 0.0000			
Count R2 = 0.823			

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Coefficients are Unstandardized coefficients with standard errors in parentheses

According to the results, this study did not find statistically significant factors in the economic pressure model. Specifically, *air quality*, *standard of living*, and *development collaboration* of green economic development factors and *fiscal condition*, *economic stress*, and *development competition of principal cities* of conventional economic development factors are not statistically significant.

However, the political/institutional choice model and the development/environmental coalition model have a couple of statistically significant variables, respectively. For the political/institutional choice model, *preference of attracting green business* of green economic development factors and *voters registered to pro-environmental party* of conventional economic development factors are statistically significant. As local governments perceive attraction of green businesses as more important, they are likely to use regulatory relief for renewable energy development 3.45 times more, holding all other variables constant. In other words, as local governments perceive the importance of the attraction of green businesses a unit more, the probability of using regulatory relief for renewable energy development increases 0.10. In addition, voters registered to pro-environmental party reveal that as a unit of voters' percent registered as member of the Democratic or the Green Party increases, local governments are likely to use regulatory relief for renewable energy development 0.96 times less, holding all other variables constant. In addition, while the marginal effect of voters' party preference has a negative direction, it is extremely small. However, *lack of expertise on green economic development* of the green economic development factors and *government structure* and *administrative capacity* of the conventional economic development factors are not statistically significant.

For the development/environmental coalition model, *support of environmental protection organizations* of the green economic development factors and *support of private development organizations* of the conventional economic development factors are statistically significant and have positive influences on the use of regulatory relief for renewable energy development. As environmental protection organizations are more supportive of energy conservation and climate protection efforts by their governments, local governments are likely to use regulatory relief for renewable energy development 3.62 times more, holding all other variables constant. In other words, as environmental protection organizations strongly support energy conservation and

climate protection efforts by their local governments a unit more, the probability of using regulatory relief for renewable energy development increases 0.10. For private development organizations, as they are more supportive of the energy conservation and climate protection efforts by their governments, local governments are likely to use the regulatory relief for renewable energy development 1.69 times more, holding all other variables constant. In other words, as private development organizations strongly support energy conservation and climate protection efforts by their local governments a unit more, the probability to use regulatory relief for renewable energy development increases 0.04. However, *support of neighborhood organizations* of green economic development factors and *support of public organizations* of conventional economic development factors are not statistically significant.

# CHAPTER 6

## DISCUSSION

### **6.1 Comparative Analyses of Development Incentives and Regulatory Relief**

This section compares the findings regarding the two policy tools of development incentives and the two policy tools of regulatory relief, respectively. The comparative analyses provides the bases to discuss the findings across the three models, including the differences of findings between green economic development factors and conventional economic development factors that are nested in each model.

#### **6.1.1 Development Incentives**

A summary of the influences of explanatory factors on the use of both incentives for energy efficient technology and renewable energy development are presented in Table 6.1. An important finding is that incentives for green economic development are not products of economic condition and pressure. For both the political/institutional choice model and the development/environmental coalition model, significant factors influencing the use of incentives for energy efficient technology and renewable energy development demonstrate similar results. However, no factor in the economic pressure model is statistically significant. This is in stark contrast to previous studies related to economic development activities which argued factors derived from economic pressure model significantly influence the implementation and use of policy tools for local economic development (Peterson, 1981; Wong, 1988; Hammer and Green, 1996). This study concludes that the influences of these factors on the use of incentives for green economic development are generally unimportant.



**[Table 6.1] Comparative Analysis of Incentives for Green Economic Development**

<b>Explanatory Variables</b>	<b>Incentives for Efficient Energy Use Technology Development</b>	<b>Incentives for Renewable Energy Development</b>
<b>Economic Pressure Model</b>		
<b>Green Economic Development Factors</b>		
Air Quality		
Standard of Living		
Development Collaboration		
<b>Conventional Economic Development Factors</b>		
Fiscal condition		
Economic Stress		
Development Competition of Principal Cities		
<b>Political/Institutional Choice Model</b>		
<b>Green Economic Development Factors</b>		
Lack of Expertise on Green Economic Development		
Preference for Attracting Green Businesses	+	+
<b>Conventional Economic Development Factors</b>		
Governmental Structure		
Administrative Capacity	+	+
Voters' Preference		-
<b>Development/Environmental Coalition Model</b>		
<b>Green Economic Development Factors</b>		
Support of Environmental Protection Organizations		
Support of Neighborhood Organizations	+	+
<b>Conventional Economic Development Factors</b>		
Support of Private Development Organizations		
Support Public Organizations		
N of Obs. =	147	147
LR chi2(15) =	29.19	33.38
Prob > chi2 =	0.0152	0.0042
Count R2 =	0.884	0.857

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Blanks are not significant variables.

Additionally, this study suggests that local governments' perception of and motivation for local green development substantially influence the use of policy tools for local green economic development. Since the increasing importance of attracting green businesses in their jurisdictions provides decision makers with greater motivation and willingness, the decision makers will attempt to create and use a variety of incentives for green economic development. In addition, in order to develop and successfully implement useful incentives and control mechanisms, administrative capacity will be an essential condition (Ha and Feiock, 2011). Businesses

inherently tend to be opportunistic and maximize their interests. Therefore, administrative capacity is a prerequisite to monitor opportunistic behaviors of businesses and develop useful incentives and strategies for green economic development. Accordingly, administrative capacity will still be important for the use of green economic development policy tools. Because of these reasons, the *administrative capacity* of the political/institutional choice model will significantly influence both incentives for energy efficient technology development and renewable energy development and be important in both conventional and green economic development.

Furthermore, voters registered to a pro-environmental party have a negative impact on the use of incentives for renewable energy development. Elected officials seek to reflect voters' preferences, interests, and ideology in the policy decision making processes to involve them in their parties because voters' party preference generally is reflected in voting results. Therefore, the influence of voters registered to pro-environmental party will be influential in the use of policy tools for green economic development. The standard expectation is that the Democratic and the Green Parties basically are pro-environmental and will support green development. However, this result contradicts the argument. Why might this unexpected result occur? This result may be a finding unique to Florida or a distinguishing characteristic of renewable energy different from other efforts for green economic development.

For example, the administration of Republican Governor Crist of Florida had emphasized climate protection and clean energy since 2006. At that time, even though the governor belonged to the Republican Party, he specifically emphasized renewable energy development. In addition, incentives for renewable energy development are often pro-business strategies that the Republican Party used to promote local economic development activities. On the other hand, renewable energy development may not physically be a useful alternative for local economic development in terms of citizens. Some studies warn against energy sprawl due to renewable energy development (McDonald, et al., 2009). Much renewable energy equipment is also likely to generate negative externalities. For example, biomass power plants usually generate air pollution and can lower land and housing value around them. Biofuels and biomass burning of energy crops for electricity also take the most space per unit power. Solar energy plants also require huge land space to establish the facilities (McDonald, et al., 2009). Wind power plants

also generate noise pollution. Therefore, renewable energy facilities are likely to be regarded as NIMBY (Not In My Back Yard) facilities to citizens.

As a result, even though the Democratic Party and the Green Party advocate environmental protection, they might have different perspectives on renewable energy. A recent study of the influence of voters' party preference on the adoption and implementation of a variety of policies and institutions related to climate protection suggests that increasing the percent of voters supporting Democratic candidates in an interest group model increases Municipal Climate Protection Index (MCPI) scores. Ironically, however, a full model of the study indicates that increasing the percent of Democratic voters decreases the City Municipal Climate Protection Index even though the result is not statistically significant (Krause, 2011b). At the minimum, the result suggests that voters' preference related to renewable energy is more complex than to environmental policy and might not be in alignment with it as to environmental policy.<sup>24</sup>

Lastly, neighborhood organizations' support also more promotes cities to use both incentives for green economic development. These organizations seek to manage and improve the residential environment and put issues related to residents' interests on the political agenda. Even though neighborhood organizations are residents of their communities, they are likely to be excluded from decision making processes for community development in conventional economic development. However, their intervention and power become more influential and active in the decision making process for green economic development. In order to successfully implement policies related to green economic development, many green projects and policy tools need residents' active involvement and information. In addition, these projects are likely to directly influence the residential environment. Therefore, neighborhood organizations' participation and power increases and significantly influence the use of incentives for green economic development. Because of these reasons, their support on energy conservation and climate protection efforts by their local governments will substantially promote the use of these incentives.

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<sup>24</sup> Since direction of the results is discussed in previous comparative analysis of three models, I omit its discussion here.

In sum, the influence of explanatory factors on both incentives for energy efficient technology and renewable energy development are similar even though the incentive policy tools are derived from two different perspectives: neo-classical economic and ecological economic perspective. Voters' party preference simply exhibits a different result. Why do not these incentive tools show clear differences despite the different theoretical foundation? There might be several arguments. However, I suggest that incentives for green economic development inherently involve high uncertainty because many businesses have short-term time horizons and are likely to be opportunistic. Therefore, administrative capacity and interest groups' power can substantially influence the decision for use of the policy tools, and thus the use of incentives for green economic development is likely to be political bargaining.

Local governments have a unitary interest in economic development policy that is driven by the city's economic and fiscal stress (Peterson, 1979; 1981; Wolman and Spitzley, 1996). Therefore, economic pressure has been emphasized in conventional economic development. However, this study suggests that the use of incentives for green economic development is significantly influenced by political choice, administrative capacity, and influence and activities of interest groups such as neighborhood organizations, rather than economic pressure. The results of this study may be temporal and/or particular processes happening in the transition from conventional economic development to green economic development. However, when considering the theoretical foundation, it might be obvious that, unlike incentives for conventional economic development, the use of incentives for green economic development is impacted by political and institutional choice and capacity and development and environmental coalitions, rather than economic pressure.

Lastly, comparative analyses between green and conventional economic development factors across the three models suggest that perception of the importance of attracting green businesses and the growing roles and influence of neighborhood organizations are important in green economic development activities. This implies that the extent to which local governments or decision makers have perception of green development and willingness to attract green businesses influence the development and use of policy tools for green economic development. In addition, neighborhood organizations will play key roles in green economic development

activities with private developers and government that have been the main actors in conventional economic development.

### **6.1.2 Regulatory Relief**

The influence of explanatory factors on regulatory relief for energy efficient technology and renewable energy development is reported in the Table 6.2. This analysis also compares findings across the three models, including the differences of findings between green economic development factors and conventional economic development factors that are embedded in each model.

The significant finding of this study is that while regulatory relief for energy efficient technology development is significantly influenced by economic condition and pressure, regulatory relief for renewable energy development is usually influenced by political choice, willingness of local governments, and development/environmental coalitions' preference and power. This distinction appears to be strongly associated with the distinguishing attributes between energy efficient technology supported by neo-classical economics and renewable energy supported by ecological economics.

This study suggests that communities with a better standard of living will seek to relieve regulations for energy efficient technology development in different ways. They need to maintain high property values and thus a better residential environment. Citizens residing in residential areas with high housings value consider the standard of living as very important. Accordingly, standard of living can be a significant determinant influencing the use of green economic development policy tools. While strongly controlling or screening polluters, the citizens also will seek to relieve regulations related to clean energy in order to promote local green economic development. Additionally, this study reports that local governments interacting more collaboratively with other agencies or local governments are more likely to relieve regulations for energy efficient technology development. Local governments will learn a variety of strategies or information for clean environment and green development through collaboration with other communities or agencies. Because of this reason, development collaboration is considered as a significant mechanism in green economic development. Therefore, these local

governments will seek to reform and relieve regulations related to the clean environment and green development in order to provide businesses with more convenient conditions required to develop energy efficient technology.

[Table 6.2] Comparative Analysis of Regulatory Reliefs for Green Economic Development

Explanatory Variables	Regulatory Relief for Efficient Energy Use Technology Development	Regulatory Relief for Renewable Energy Developemnt
<b>Economic Pressure Model</b>		
<b>Green Economic Development Factors</b>		
Air Quality		
Standard of Living	***	
Development Collaboration	+	
<b>Conventional Economic Development Factors</b>		
Fiscal condition		
Economic Stress	+	
Development Competition of Principal Cities	+	
<b>Political/Institutional Choice Model</b>		
<b>Green Economic Development Factors</b>		
Lack of Expertise on Green Economic Development		
Preference for Attracting Green Businesses	***	***
<b>Conventional Economic Development Factors</b>		
Governmental Structure		
Administrative Capacity		
Voters' Preference		- *
<b>Development/Environmental Coalition Model</b>		
<b>Green Economic Development Factors</b>		
Support of Environmental Protection Organizatoins		***
Support of Neighborhood Organizations		
<b>Conventional Economic Development Factors</b>		
Support of Private Development Organizations	***	***
Support of Public Organizations		
N of Obs. =	147	147
LR chi2(15) =	54.71	55.48
Prob > chi2 =	0.0000	0.0000
Count R2 =	0.857	0.823

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Blanks are not significant variables.

Furthermore, economic conditions such as economic stress and development competition were considered in conventional economic development as important factors which can play a pivotal role in reliving regulations for energy efficient technology development to provide a

variety of development strategies to businesses for green economic development. However, these economic conditions do not significantly influence regulatory relief for renewable energy development. This result means that while economic conditions and pressure play a pivotal role in relieving regulations that are related to energy efficient technology development, it is not clear whether or not economic conditions play a critical role in relieving regulations related to renewable energy development.

In also these models as seen in the models of development incentives, local governments' preferences and perceptions of green development significantly influence efforts to promote green economic development. Local governments with greater willingness and motivation to recruit green businesses will reduce the regulatory burden to provide convenience and streamlined processes to businesses that participate in the development of energy efficient technology and renewable energy. In addition, regulatory relief for renewable energy development recently emerged as a potential alternative for green economic development and thus has not empirically verified by sufficient studies. Therefore, decision makers' preferences and perceptions rather than economic conditions can be determinants for their decision making. In this sense, preference for attracting green businesses in their jurisdictions significantly influences decision making of both regulatory reliefs for green development. Additionally, voters' party preference also significantly influences regulatory relief for renewable energy development. As mentioned in the previous model of development incentives, there may be a variety of reasons to explain the influence of voters registered to pro-environmental party on incentives for renewable energy development. Even though voters registered as members of the Democratic or the Green Party might pro-environmental, they might not support renewable energy development because the energy generates negative externalities and energy sprawl such as noise or air pollution, decrease of land value, huge land tracts required for biofuels and solar arrays, and expensive costs. The results with presidential election data of 2008 at the county level and gubernatorial election data of 2010 at the county level also indicate negative effects on the use of policy tools for renewable energy development. These findings need to be studied more in detail.

This research also suggests that support of environmental protection organizations in local governments significantly contribute to regulatory relief for renewable energy development.

Since environmental protection organizations monitor polluters and control over-development, there might be an argument that these organizations attempt to apply more stringent regulations to renewable energy development. However, these organizations are most interested in activities and alternatives that can prevent environmental pollution. Therefore, they seek to involve in activities to promote renewable energy development for environmental protection and will support regulatory relief for renewable energy development. Accordingly, support of these organizations will stimulate decision makers and local governments to relieve regulations that might become barriers against renewable energy development. Furthermore, since private development organizations of local governments also attempt to reduce energy costs and must abide by environmental regulations and penalties of governments, they usually support the energy conservation and climate protection efforts of local governments if governments provide useful benefits for their involvement. Lobbying and active involvement of these private development organizations will heighten governments' credibility with businesses and will lead to lower regulatory barriers. In addition, businesses that have to quickly respond to market changes inherently want to reduce the regulatory burden. Because of these reasons, private development organizations prefer to relieve regulations related to energy efficient technology and renewable energy development.

In sum, factors influencing regulatory relief for energy efficient technology and renewable energy development exhibit obvious differences. What causes these distinctions? Even though neoclassical economic perspective considers environmental issues as important factors, this perspective emphasizes economic value and growth by technological innovation. Therefore, factors closely related to economic conditions such as median housing value, unemployment rates, development competition and collaboration, and support of private development organizations might significantly influence regulatory relief for energy efficient technology development. In addition, the ecological economic perspective emphasizes that environmental sustainability is a prerequisite to sustainability in other spheres and economic growth is embedded within an ecosystem. Since green economic development consider environmental, health, and economic issues together, more stakeholders are likely to be involved in green economic development activities and policy decisions than in conventional economic development. Accordingly, policy tools derived from this perspective are likely to result from bargaining and mediation among stakeholders with different interests. This means that these



policy tools are significantly influenced by political choice and stakeholders' power. Therefore, regulatory relief for renewable energy development is significantly influenced by factors related to political factors and stakeholders such as preference for attracting green businesses, voters' party preference, and support of environmental protection organizations.

Lastly, comparative analyses between green and conventional economic development factors across the three models suggest that the standard of living and collaborative activities integrating different stakeholders' interests and sharing useful information are emerging as important factors in green economic development activities. In addition, the results demonstrate that the roles and influence of environmental protection organizations and recognition and willingness of decision makers to stimulate green economic development can become determinants to realize successful green economic development.

## **6.2 Integrated Analyses across Development Incentives and Regulatory Relief**

Table 6.3 presents incentives and regulatory relief for energy efficient technology development and renewable energy development. The results suggest appealing findings and implications. First, this study explains the implications of each factor and then comparatively addresses them in terms of the types of policy tools and typologies of explanatory factors.

Preference for attracting green businesses of political/institutional choice model significantly influences all four types of policy tools. This means that motivation and willingness of decision makers or local governments substantially influence the use of policy tools for green economic development. In addition, since whether or not policy tools for green economic development successfully promote local economic development by increasing green jobs or income is not supported by sufficient empirical studies, local governments' willingness and preference seem to play critical roles in making decisions regarding the use of policy tools for green economic development. Decision making in the transition period generally may be dependent on internal perception and motivation driven by external stimulation. In this sense, because local governments currently are in transition from conventional economic development

to green economic development, their preference and recognition seems to influence the decision of using green economic development policy tools.

[Table 6.3] Comparative Analysis across Policy Tools

Types of Policy Tools	Development Incentives		Regulatory Relief for Development	
	Energy efficient technology	Renewable Energy	Energy efficient technology	Renewable Energy
<b>Explanatory Variables</b>				
<b>Economic Pressure Model</b>				
<b>Green Economic Development Factors</b>				
Air Quality				
Standard of Living			***	
Development Collaboration			+	*
<b>Conventional Economic Development Factors</b>				
Fiscal condition				
Economic Stress			+	*
Development Competition of Principal Cities			+	*
<b>Political/Institutional Choice Model</b>				
<b>Green Economic Development Factors</b>				
Lack of Expertise on Green Economic Development	+	*	***	***
Preference for Attracting Green Businesses				
<b>Conventional Economic Development Factors</b>				
Governmental Structure				
Administrative Capacity	***	+		
Voters' Preference		**		- *
<b>Development/Environmental Coalition Model</b>				
<b>Green Economic Development Factors</b>				
Support of Environmental Protection Organizations				***
Support of Neighborhood Organizations	***	***		
<b>Conventional Economic Development Factors</b>				
Support of Private Development Organizations			***	***
Support of Public Organizations				
N of Obs. =	147	147	147	147
LR chi2(15) =	29.19	33.38	54.71	55.48
Prob > chi2 =	0.0152	0.0042	0.0000	0.0000
Count R2 =	0.884	0.857	0.857	0.823

Note: \* p<0.1, \*\* p<0.05, \*\*\* p<0.01. Blanks are not significant variables.

Administrative capacity of political/institutional choice model significantly influences the use of development incentives. In order to successfully apply development incentives, local governments must have sufficient staff with expertise and experience to monitor and manage the

incentives businesses receive. Therefore, administrative capacity measured by the number of per capita staff can significantly influence the application of development incentives.

The influence of neighborhood organizations in the development/environmental coalition model is also salient in the use of development incentives. In conventional economic development, neighborhood organizations are likely not to be main actors in decision making processes for community development policies. Governments and private developers were primary actors and neighborhood organizations have been isolated from decision making processes for local development policies. However, the role and power of neighborhood organizations in green economic development seem to be more influential than in conventional economic development. Since policies for green economic development directly influence residential environment of communities and need to be fitted to the community environment, residents' active involvement and support through information provision, political support, and participation are required to promote successful policy application and achievement. Accordingly, they significantly impact the use of development incentives for green economic development.

In addition, this study suggests that voters registered to Florida's Democratic or Green party are likely to discourage incentive use and regulatory relief for renewable energy development. Traditionally, it was believed that voters registered to these parties will be pro-environmental and will support regulatory relief for renewable energy development. However, the results of this study refute these expectations. Even though there may be many reasons for the results, three possible arguments are offered. First, Governor Crist's administration from 2006 to 2010 of Florida emphasized renewable energy development and efforts against climate change even though he was a Republican. Therefore, it might be a unique case for Florida at that time. Second, many concerns about renewable energy are emerging, however in practice renewable energy generates negative externalities. For example, energy sprawl due to the substantial amount of land required to establish solar arrays and biofuels and biomass burning of energy crops for electricity, air pollution generated by biomass power plants, and noise pollution generated by wind power plants. Lastly, local governments might approach renewable energy in terms of a business perspective to create more jobs and recover the local economy. This approach is a pro-business view and usually has been used by the Republican Party. Therefore,

the finding seems to be in a negative direction against incentives or regulatory relief for renewable energy development. According to different pre-tests with the presidential election data of 2008 and gubernatorial election data of 2010, the results were the same. Therefore, this study argues that unlikely traditional expectations, citizens registered as members of the Democratic or the Green Parties of Florida are likely to not prefer to incentives and regulatory relief for renewable energy development.

In addition, support of the private development organization of the development/ environmental coalition model significantly influences regulatory relief for green development. Private development organizations prefer to respond to market change quickly and tend to pursue short-term commercial interests, rather than long-term environmental interests. Therefore, they are likely to avoid jurisdictions which stringently apply development or environmental regulations. Rather, they prefer to be located in the jurisdictions friendly to businesses. Accordingly, support for private development organizations promotes regulatory relief and efforts for regulatory relief of local governments in different ways. Therefore, support of private development organizations for energy conservation and climate protection efforts of local governments will substantially influence regulatory relief for energy efficient technology and renewable energy development.

Furthermore, comparative analyses across incentives and regulatory relief for energy efficient technology development show distinguishing differences. This might result from the distinctions between development incentives and regulatory relief. Incentives are benefits to promote existing businesses or attract businesses from other jurisdictions. However, these incentives are likely to generate high uncertainty because businesses cannot or intentionally do not produce expected benefits. Therefore, the decision for incentive use will be influenced substantially by governments' capacity/willingness and other stakeholders' efforts/power. In this sense, the willingness, preference, and administrative capacity of local governments and efforts of supporters such as neighborhood organizations significantly influence the use of development incentives for energy efficient technology. On the other hand, regulatory relief for energy efficient technology development is a tool to reduce the opportunistic strategies of businesses resulting from complicated and stringent regulations, and lead businesses to better meet governments' goals. Therefore, regulatory relief will lower uncertainty and risk (Feiock and

Jeong, 2002). In this case, as opposed to the political conditions of local government and other stakeholders, economic conditions such as standard of living, economic stress, and development collaboration and competition can substantially influence the use of policy tools for green economic development. In addition, for regulatory relief for energy efficient technology development, the preference for attracting green businesses and private development organizations influences regulatory relief for energy efficient technology development. These results will be because preference for attracting green businesses directly influences the motivation and willingness of local governments, and private development organizations that inherently prefer to relieve regulations.

Why are the uses of incentives and regulatory relief of renewable energy development influenced by similar variables of the three models? Renewable energy is the alternative with the most potential to emerge in the transition from conventional economic development to green economic development. Even though advantages and disadvantages of renewable energy such as biomass, solar, wind power have been discussed and local governments have experienced trial and error, their utility needs to be more empirical verification. Therefore, the use of incentives and regulatory relief for renewable energy development seems to be influenced by factors related to local governments' perceptions and willingness, voters' preference, and the extent of support and opposition of stakeholders such as environmental protection, neighborhood, and private development organizations.

Lastly, the influence of explanatory factors on incentives and regulatory relief for energy efficient technology and renewable energy development do not demonstrate obvious distinctions between the factors derived from green and conventional economic development across four policy tools. However, these findings confirm that while the influence of explanatory factors depending on the characteristics of development incentives and regulatory relief can be different in specific factors, factors derived from both conventional economic development activities and green economic development activities are important for successful green economic development. In spite of this broad understanding, this study identifies that there are many conventional economic development factors considered as important in green economic development and that there are factors significantly influencing the use of green economic development policy tools.

# CHAPTER 7

## CONCLUSOIN

### 7.1 Summary

Current economic development activities and policies are transitioning from conventional economic development to green economic development. Many local governments have attempted to develop a variety of green economic development policy tools and apply them to their local economy. The inquiry of this study begins with questioning what accounts for the use of local green economic development policy tools targeted to energy based green businesses such as renewable energy development and energy efficient technology development. This study considers the transition from conventional economic development to green economic development activities using three explanatory models (economic pressure model, political/institutional choice model, and development/environmental coalition model) to address the adoption of local economic development policy tools. In addition, the factors added to address green economic development activities and the factors addressing conventional economic development activities are nested in each of the three explanatory models. This study also incorporates typical policy tools addressing local green economic development (incentives and regulatory relief) into two areas of energy efficient technology and renewable energy based on two perspectives addressing green economic development (neoclassical economic perspective and ecological economic perspective). Then, this study explores what accounts for the use of policy tools for energy based local green economic development by investigating the causal relationship between the explanatory factors and the use of policy tools for energy based green economic development.

The analyses suggest many appealing and critical findings. In the model explaining development incentives for energy efficient technology, preference for attracting green businesses and administrative capacity have significant influence on the use of development incentives for energy efficient technology. For the development incentives for renewable energy

development, preferences for attracting green businesses, administrative capacity, voters registered to pro-environmental party, and support of neighborhood organizations significantly influence the use of incentives for renewable energy development. Additionally, in the model of regulatory relief for energy efficient technology, standard of living, development collaboration, economic stress, development competition of principal cities, preference for attracting green businesses, and support of private development organizations have significant influence on the regulatory relief for energy efficient technology development. Lastly, in the model explaining regulatory relief for renewable energy development, preference for attracting green businesses, voters registered to pro-environmental party, and support of neighborhood organizations and private development organizations substantially influence regulatory relief for renewable energy development. Theoretical and practical implications of these findings are discussed in the next section.

## **7.2 Theoretical and Practical Implications**

Energy based green economic development is emerging as one of the most viable alternatives for green economic development in the United States. Energy is essential for most businesses and industries but is also a key source for generating environmental pollution. Therefore, a theoretical framework to systematically address energy based green economic development activities is required. Current economic development is in transition from conventional economic development to green economic development. However, previous studies have concentrated on the use of conventional economic development policy tools. Therefore, there are limitations when addressing the use of policy tools in emerging green economic development activities. Accordingly, this study advances a theoretical framework to address the use of energy based green economic development policy tools. Specifically, the framework of this study includes the explanatory factors derived from conventional economic development activities and the explanatory factors derived from green economic development activities together. Accordingly, this study simultaneously addresses the transition as well as green and conventional economic development activities. As a result, important implication of this study is to provide a theoretical framework to more systematically address the use of policy tools for green economic development and the transition.

This study provides significant practical implications. This investigation first identifies that local governments or decision makers' recognition of the importance of green businesses and industries substantially influence the promotion of development incentives and regulatory relief and the use of these policy tools. This recognition will provide local governments or decision makers with stronger willingness and motivation to promote successful green economic development, and thus local governments will seek to develop better incentives and reform or relieve regulations. Additionally, neighborhood organizations and environmental protection organizations were likely to restrict over-development or environmental pollution that local governments or private developers usually generate in conventional economic development. Local politics is often characterized by conflicts between pro-development organizations such as private developers and local governments and pro-environment organizations such as neighborhood and environmental protection organizations. Local governments and private development organizations that are key decision makers in conventional economic development may isolate neighborhood or environmental protection organizations from decision making for local economic development. However, in decision making processes for green economic development, local governments and private development organizations consider these organizations as key decision makers and attempt to actively involve these organizations into decision making processes for local green economic development. Therefore, these organizations appear to significantly influence the decision for use of policy tools for local green economic development. These organizations' roles and power might increase more in green economic development because local governments and private developers begin to recognize that they need to obtain useful information for successful green economic development from neighborhood and environmental protection organizations. In addition, many projects and policies related to green economic development directly influence their interests and thus they seek to form coalitions to increase political power and activities. Another additional finding is that even though standard of living and development collaboration do not dominantly influence the policy tools used in this study, these factors also are determinants influencing regulatory relief for energy efficient technology development. This might mean that standard of living of communities and collaborative activities for green development can play important roles in promoting regulatory relief for energy efficient technology development.



This research also finds that many but not all explanatory factors derived from conventional economic development are important in the use of green economic development policy tools. In particular, administrative capacity is a determinant influencing the use of both development incentives. Administrative capacity to monitor and manage opportunistic and strategic businesses that received development incentives seems to be important in both conventional and green economic development factors. This study identified that private development organizations actively play roles in reducing regulations related to green economic development as they do in conventional economic development. In addition, this study found that factors considered as key determinants in conventional economic development such as economic stress and development competition still substantially influence regulatory relief for energy efficient technology development.

Finally, a unique finding is that voters registered as member of the Democratic or Green parties in Florida are less likely to support incentives and regulatory relief for renewable energy development. Voters supporting the Democratic or the Green party are pro-environmental and thus expected to support policies for renewable energy development. However, the finding clearly presents the results are the opposite.<sup>25</sup> This result can be supported by three arguments. Renewable energy is a main cause of energy sprawl requiring a substantial amount of land and generates many negative environmental externalities even though it can reduce environmental pollution. Therefore, renewable energy facilities are likely to be considered as NIMBY facilities. This issue divides liberals. Therefore, their recognition of renewable energy might be different from their perception of environmental protection. In addition, in Florida, renewable energy policy may be associated with Republicans. Since 2006, Florida has emphasized climate change and has promoted renewable energy development as an alternative even though the party in power was the Republican Party. Therefore, it might be temporal results happening in Florida alone. However, recent empirical studies at the national level support the results of this study. Lastly, development incentives and regulatory relief are traditionally strategies of the Republican Party. Therefore, these policy tools might be used by the Republican Party.

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<sup>25</sup> As mentioned in the discussion, this study pretested with president election data of 2008 and gubernatorial election data of 2010 at the county level and the results were the same.

This study also investigates why two policy tools of development incentives present similar results and why two policy tools of regulatory relief for development show obviously different results. Incentives of green economic development inherently have high uncertainty, and a variety of stakeholders are involved in the decision for use of the incentives. Thus, the use of policy tools for green economic development is a product of political bargaining and collective action among stakeholders. Therefore, factors of the political/institutional choice model and the development/environmental coalition model significantly influence the incentive use for green economic development. Furthermore, while regulatory relief for energy efficient technology development is derived from neoclassical economics that emphasizes economic value and condition, regulatory relief for renewable energy is derived from ecological economics that emphasizes eco-system balance and integration of a variety of factors. Therefore, while regulatory relief for energy efficient technology development is substantially influenced by factors of the economic pressure model that are closely related to economic condition and value, regulatory relief for renewable energy development is significantly influenced by factors of the political/institutional choice model and the development/environmental coalition model that are closely related to political choice and the collective action of stakeholders.

This study also compares why incentives and regulatory relief for energy efficient technology development show different results and why incentives and regulatory relief for renewable energy development present similar results with each other. For incentives and regulatory relief of energy efficient technology, as addressed previously, incentives tend to generate high uncertainty due to opportunistic strategies of businesses and uncertainty of expected results. Therefore, the decision regarding incentive use will be influenced substantially by political choice and stakeholders' efforts and power. In this sense, factors of the political/institutional choice model and the development/environmental coalition model substantially influence the use of incentives for energy efficient technology.

In addition, this study pays attention to the fact that the regulatory relief for energy efficient technology development is a potential alternative from the neoclassical economic perspective that emphasizes economic value and condition and economic growth through technological innovation. Therefore, while the influence of factors derived from the political/institutional choice model and the development/environmental coalition model is

limited to a couple of factors, factors of the economic pressure model significantly influence the use of the policy tool. Finally, for incentives and regulatory relief of renewable energy, the utilities and decision making regarding renewable energy need a greater variety of empirical analyses and evidence. Lack of empirical evidences leads decision makers to be more dependent on their preference and perception related to green development. Renewable energy is also a potential alternative that is suggested by the ecological economic perspective that emphasizes eco-system balance including economic growth, health problems, and environmental problems. Therefore, many stakeholders are likely to intervene in decision making regarding this policy tool and generate collective action problems. Accordingly, the use of incentives and regulatory relief for renewable energy development seems to be influenced by the extent of support and opposition of stakeholders, rather than economic conditions.

### **7.3 Future Study**

This study attempted to address and comparatively analyze the influence of explanatory factors on policy tools for green economic development in different dimensions. However, this study will be expanded on the four limitations analyzed more systematically in future studies.

First, in order to present a more reasonable argument, this study needs to analyze the results using longitudinal data at the national level. In fact, this study could not determine whether the influence of voters' party preference is a temporal result of Governor Crist's administration. The result may also be unique to Florida. This might be a temporal result emerging in during the transition from conventional economic development to green economic development. Therefore, examination of this limitation needs to be investigated in future studies.

Second, policy tools used in this study are limited to two typical instruments: incentive and regulation. Other instruments such as strategic planning also play pivotal roles as policy tools in economic development. Strategic planning can enhance political feasibility by focusing on target populations. The strategic planning needs to be included as one of policy tools for green economic development. However, this study could not include this policy tool due to data limits.

Third, this study depends on the survey question as to whether or not local governments use the policy tools for green economic development with dichotomous variables. However, this question cannot explain the variation of using green economic development policy tools. In order to overcome this interpretative limitation, future studies need to reflect the variation of using local green economic development policy tools. Furthermore, this study will be extended to questioning what factors increase the number of policy tools used. Answering this question can explain the efforts and activities of local governments to promote local green economic development. These studies will provide more sufficient explanation of local governments' activities related to the use of policy tools for local green economic development.

Finally, analyses of the influence of explanatory factors on the use of policy tools for green economic development need to be brought to the extent to which the use of these policy tools influence the performance of green economic development policy tools in order to empirically analyze the utility of these policy tools. Therefore, future research will be extended to the inquiry at to the extent to which the use of these policy tools for green economic development positively increases green economic development performance such as job creation or income.

## APPENDIX A

### CORRELATIONS AMONG EXPLANATORY VARIABLES

	EP	IL	DC	FS	ES	DC	EG	PA	GS	AC	CP	EO	NO	DO	PO
Environmental Pollution(EP)	1														
Income Level(IL)	0.01	1													
Development Collaboration (DC)	0.10	0.06	1												
Fiscal condition (FS)	-0.00	0.12	-0.06	1											
Economic Stress (ES)	0.13	-0.14	-0.05	-0.02	1										
Development Competition (DC)	-0.16	0.05	0.12	0.12	-0.11	1									
Expertise on Green Development (EG)	-0.12	-0.28	-0.15	-0.05	0.07	-0.27	1								
Preference of Attracting Green Businesses (PA)	0.06	-0.19	0.21	-0.04	0.00	0.10	-0.12	1							
Governmental Structure (GS)	-0.12	-0.03	-0.05	-0.12	0.02	-0.03	0.01	-0.00	1						
Administrative Capacity (AC)	-0.12	0.04	-0.20	0.33	0.00	0.12	-0.06	0.00	-0.01	1					
Voters' Preference (VP)	0.04	-0.42	-0.02	-0.02	-0.07	-0.15	0.11	0.09	-0.13	0.07	1				
Environmental Protection Organizatoins (EO)	0.13	0.04	0.14	-0.19	0.05	-0.14	-0.09	0.34	0.05	-0.07	0.06	1			
Neighborhood Organizations (NO)	-0.01	-0.08	0.24	0.08	-0.04	0.07	-0.17	0.40	0.08	-0.03	0.17	0.49	1		
Private Development Organizations (DO)	0.05	-0.11	0.12	-0.10	0.01	-0.03	-0.20	0.40	0.11	-0.16	0.20	0.57	0.62	1	
Pulic Organizations (PO)	-0.02	0.00	0.05	-0.02	-0.16	0.07	-0.09	0.26	-0.14	0.05	0.01	0.111	0.29	0.11	1

## APPENDIX B

### SURVEY COVER LETTER

Dear [First Name],

You are invited to participate in research regarding planning for energy and sustainability. This project is being supported by the National Science Foundation and the Institute for Energy Systems, Economics, and Sustainability (IESES) at Florida State University. This survey is designed to be completed by the planning director and planning staff in your government, who is knowledgeable of energy sustainability issues.

The findings should be valuable to local governments in identifying best green practices and in planning addressing DCA's draft rule for implementing Florida Energy Bill (HB 697). We will share the results of the survey with each participating government.

The survey takes about 20 minutes to answer. The survey results are saved after each page and the survey may be stopped and returned to at a later point in time. If you prefer a paper copy, please email us and we will provide it along with a self-addressed envelope. Your participation is voluntary. If you have any specific questions or concerns, please contact me at (850) 644-7615 or [rfeiock@fsu.edu](mailto:rfeiock@fsu.edu).

Thank you in advance for your time and participation!

Sincerely,

Richard C. Feiock  
Director, Center for Sustainable Energy Governance &  
Augustus B. Turnbull Professor of Public Administration  
Askew School of Public Administration and Policy  
Florida State University  
Tallahassee FL 32306-2250  
<http://seg.fsu.edu>

Ivonne Audirac  
Associate Professor  
Department of Urban and Regional Planning  
Florida State University  
Tallahassee FL, 32306-2280  
<http://www.coss.fsu.edu/durp/>

## APPENDIX C

### SURVEY QUESTIONNAIRES

# Energy Sustainable Florida Communities



The Institute for Energy Systems, Economics and Sustainability (IESES) at Florida State University is investigating Florida local government actions related to energy efficiency and climate change to better understand and assess local efforts and to assist local governments in Florida. This project is supported by the FSU Center for Florida Local Government Excellence. Your participation is critical to the success of these efforts. This survey will take approximately 20-30 minutes to complete. We anticipate that the results will also benefit local governments and we will share these results with all participants.

Your answers to survey questions will remain confidential to the full extent allowed by law. The results of this research study will be published, but individual respondent will not be identifiable in any reports. If you have any questions concerning this research study, please contact Dr. Richard Feiock by email at [rfeiock@fsu.edu](mailto:rfeiock@fsu.edu) or phone at (850)644-3525. Thank you.

**Please return this questionnaire to:**

**Richard C. Feiock**  
**Askew School of Public Administration and Policy**  
**Florida State University**  
**Tallahassee FL 32303-2250**

**1. Energy Sustainable Florida Communities**

**1. Name of your Jurisdiction**

\_\_\_\_\_

**2. Energy and Climate Policy**

**1. How important are energy/climate change issues in your jurisdiction?**

*(Check a box.)*

- |                          |                          |                          |                          |
|--------------------------|--------------------------|--------------------------|--------------------------|
| Not<br>Important         | Somewhat<br>Important    | Moderately<br>Important  | Very<br>Important        |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

**2. Does your jurisdiction have a formal climate change and/or energy plan separate from the comprehensive plan?**

- Yes, plan(s) that includes both climate change and energy
- Yes, a plan that primarily addresses climate change
- Yes, a plan that primarily addresses energy
- No, neither an energy nor a climate change plan

**3. Which of the following energy/ climate related issues does your jurisdiction officially address (e.g., through regulation or policies) with regard to its government facilities and community at large? (select all that apply)**

	Government Facilities	Community	Don't Know
Green buildings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Retro-fitting existing buildings for energy efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alternative transportation systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green procurement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional air quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Technology innovation/ demonstration projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy efficient devices (appliances, lighting, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy efficiency Systems (building controls etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waste-to-energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Renewable energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Smart grid/net metering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alternative fuels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporating energy use in land use decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy Related development incentives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inventory of greenhouse gas emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Formally adopted greenhouse gas reduction goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**4. In which of the following initiatives is your jurisdiction participating? If not, are any being considered?**

	Yes, Currently Member/ Participant	No, but considering future participation	No	Don't Know
U.S. Conference of Mayors Climate Protection Agreement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICLEI USA – Cities for Climate Protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sierra Club Cool Cities Initiative	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HUD/DOT “Livable Communities Initiative”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FGBC – Green Local Government Designation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Audubon Sustainability Community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)				

**5. In what year would you estimate that your jurisdiction FIRST participated in any of the above initiatives?**

\_\_\_\_\_ (year)

**6. Which office or department in your jurisdiction has primary responsibility for developing energy policy plans? (select one)**

- |  |  |
|--|--|
| <input type="checkbox"/> Planning              | <input type="checkbox"/> Environment             |
| <input type="checkbox"/> Building              | <input type="checkbox"/> Mayor                   |
| <input type="checkbox"/> Energy/Sustainability | <input type="checkbox"/> Manager                 |
| <input type="checkbox"/> Community Development | <input type="checkbox"/> City Council/Commission |
| <input type="checkbox"/> Transportation        | <input type="checkbox"/> Local Utility           |
| <input type="checkbox"/> Public Works          | <input type="checkbox"/> Special Commission      |

**7. To what extent do jurisdictions in your COUNTY work cooperatively on climate change or energy planning issues?**

	Not at All	Somewhat	To A Great Extent	Don't Know
Energy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate Change	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**8. To the best of your knowledge, how active are each of the following entities in promoting sustainable energy and climate change planning and innovation in your county?**

	Not Active	Somewhat Active	Very Active	Don't Know
Municipal governments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special districts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional Planning Council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional Partnership Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MPO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL DCA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL DOT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL DEP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other state Agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private utilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Civic groups/NGOs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local builders association	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**9. If the following programs have been adopted in your jurisdiction, please indicate the year in which they were first adopted.**

	Year
Use of renewable energy sources (wind, solar, biofuel, etc...)	_____
Energy element added to comprehensive plan	_____
Adopted energy and/or climate change plan	_____
Adopted LEED or FGB standards	_____
Rebates or tax credits for renewable and/or efficient energy devices	_____
Introduced alternative fuel or hybrid vehicles into the fleet	_____

**3. Energy Cost Reduction by Government**

**1. To what extent has your government undertaken efforts to reduce overall energy use by government?**

- Not at all
- Somewhat
- A great extent

**2. On a scale from 1 = “not an obstacle” to 5 = “sustainable obstacle”, please rate the following factors with respect to your local government’s ability to reduce overall energy use.**

	Not an Obstacle	2	3	4	Substantial Obstacle
Cost/lack of funds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conflict with other budget priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of time/expertise to design and plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of informational resources	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Qualified contractors not available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lack of “political will” in the decision-making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Length of time needed for governing body approval	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Length of implementation time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**4. Economic Development**

**1. How important is the attraction of "green business" in your jurisdiction's economic development strategy?**

- Not important
- Somewhat important
- Highly Important
- Most Important

**2. Does your jurisdiction's economic development strategy include efforts to attract green business or industry through the following? (select all that apply)**

- Financial or other incentives to encourage energy efficient technologies in new development
- Financial or other incentives specifically targeted to the renewable energy sector
- Regulatory relief of streamlined processes for developments that incorporate energy efficient technologies
- Regulatory relief or streamlined processes for development in the renewable energy sector

**3. Does your jurisdiction have a written economic development plan?**

- Yes
- No

**4. Does the economic development plan explicitly address energy or climate issues?**

- Yes
- No

**5. Comprehensive Plans & State and Federal Policy**

**1. Did your jurisdiction's comprehensive plan or its amendments DIRECTLY ADDRESS climate change or energy issues in any of the following elements prior to the Florida Energy Bill ( HB 697) passed in 2008? (select all that apply)**

	Addressed Prior 2008	Addressed since 2008	Don't Know
Energy Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Housing Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conservation Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Infrastructure Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open Space and Recreation Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intergovernmental Coordination Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Management Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic Development Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Future Land-Use Element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current Land-Use Map	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Future Land-Use Map	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)_____			

**2. In planning your approach to comply with DCAs draft rule for HB 697, what actions do you anticipate? (select all that apply)**

- Add an (optional) Energy Element to the comprehensive plan that consolidates the jurisdiction’s existing and new energy policies
- Revise and/or add policies in existing elements of the comprehensive plan to meet the requirements.
- Identify Existing Plan Provisions that meet the requirements
- Don’t Know Yet

**6. Land Use and Open Space**

**1. Has your jurisdiction established LAND-USE policies or programs to encourage or require the following? (select all that apply)**

	Encourage	Require	No programs or policies In place
Reduce greenhouse gas emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compact developments in new and existing neighborhoods	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mixed-use development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transit oriented development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
In-fill development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community-wide bicycle/pedestrian plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Street design for multi-modal mobility in developments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

LEED or other Green development certification for new development or redevelopment projects

**2. Have the following Land Use Management techniques been used by your jurisdiction in the last 24 months? (Select all that apply)**

	Yes	No	Don't Know
Up-zoning to bring areas that were less dense to higher density standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inclusionary housing policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban Growth boundary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Impact Fees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Density Bonuses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transfer of Development Rights	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. To which of the following eligible activities are your Federal Energy Efficiency and Conservation Block Grant (EECBG) funds directed? (select all that apply)**

- None -Not applying for EECBG funds
- Development of an efficiency and conservation strategy
- Residential and commercial building energy audits
- Incentive programs for energy efficiency improvements
- Grants to nonprofit organizations and government agencies
- Energy conservation programs for buildings and facilities
- Development and implementation of transportation programs
- Building codes and inspections to promote energy efficiency
- Distributed resources, combined heat and power, & district systems
- Material conservation programs including source reduction, recycling, and recycled content procurement programs that lead to increases in energy efficiency.
- Methane capture from landfills
- Energy efficient traffic signals and street lighting

- Renewable energy technologies on government buildings

Other activities that meet the purposes of the program (*List Below*)

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## **7. Zoning Regulations, Subdivision Regulations, and Permitting**

### **1. Does your development review encourage energy efficient land use patterns through any of the following strategies? (select all that apply)**

- Compact arrangement of higher density and intensity of mixed land uses that support a multi-modal transportation system
- Infill and redevelopment
- Accounting for existing and future electric power generation and transmission systems
- Complete streets that accommodate transit, pedestrians, bicyclists and motorists
- Reduced parking footprint
- Street network connectivity
- Landscape planting for energy conservation
- Green infrastructure
- Heat Island Reduction
- Preservation of open space and urban and rural forests for CO2 capture
- Lot and/or street orientation for wind or solar consideration
- Housing and jobs proximity
- Housing and school proximity
- Infrastructure (water & sewer) proximity

### **2. Does your jurisdiction's site plan and development review encourage the following green Construction & Technology issues? (select all that apply)**

Review Accounts for:

Daylighting

Certified Green Buildings	<input type="checkbox"/>
Energy Efficient Buildings	<input type="checkbox"/>
Reduced Water Use	<input type="checkbox"/>
Heat Island Reduction	<input type="checkbox"/>
Passive and/or Active Solar Collection	<input type="checkbox"/>
On – Site Renewable Energy Sources	<input type="checkbox"/>
Light Pollution Reduction	<input type="checkbox"/>
Green Roofs	<input type="checkbox"/>
Permeable Paving	<input type="checkbox"/>
Don't Know	<input type="checkbox"/>

**2.5. How many months would you estimate is the average processing time necessary for new single family residential development applications from formal application to formal approval?**

Months \_\_\_\_\_

**3. Does your development review system offer fast-track, streamlining or other development-review incentives to encourage green neighborhood design?**

- Yes – Expedited or streamlined permitting
- Yes – Reduced permitting costs
- Yes – Other
- No
- Don't Know

**4. Does your jurisdiction offer density bonuses or other incentives to developers for incorporating energy efficiency or sustainable elements into their projects?**

- Yes
- No
- Not now, but under consideration
- Don't Know



**5. Do your jurisdiction's zoning regulations reference any of the following generation facilities?**

	Included in Present Zoning Regulations	Under Construction	Not Included nor Under Consideration	Don't Know
Wind Farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Distributed Generation Energy Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biomass Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solar PV Farms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cogeneration Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nuclear Plants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Methane Facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coal, Oil, or Gas Fired Plants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify) _____				

**6. Does your jurisdiction have policies, plans, or regulations for the following?**

	Yes	No	Don't Know
Greenways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water source and flow protection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tree preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tree planting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban forest management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prime farmland preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green streets, bioswells, or rain gardens	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**8. Housing and Green Building**

**1. Does your jurisdiction offer LOANS, GRANTS, or REBATES to encourage energy efficiency or energy savings? (select all that apply)**

	Yes	No	Don't Know
Upgrading or retrofitting buildings (windows, roofs, Insulation, weather-stripping etc...)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upgrading heating ventilation & air conditioning (HVAC)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Upgrading building electrical systems (including lighting)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Upgrading appliances for energy conservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solar hot water heating panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Solar PV panels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green roofs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High reflection paving or roofing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**2. Does your jurisdiction offer permitting incentives to encourage the construction of energy efficient buildings**

- No
- Yes – Expedited or streamlined permitting
- Yes – Reduced permitting costs
- Don't Know

**3. Does your jurisdiction have green building requirements or guidelines based on LEED, FGBC, or Energy Star standards?**

- Yes
- No
- Don't Know

**4. Are your green building actions part of a county-wide or region-wide coordinated effort?**

- Yes
- No
- Don't Know

**5. Are your green building guidelines or requirements part of a formal climate action strategy?**

- Yes
- No
- Don't Know

**9. Transportation and Green Transit**

**1. What types of public transit are available in your jurisdiction? (*all that apply*)**

- Bus
- Express bus rapid transit (BRT)
- Rail (heavy, light, including streetcars)
- Paratransit (vans, buses, other)
- Public transit is not provided by your jurisdiction

Other (*please specify*)\_\_\_\_\_

**2. What “green transit” technologies has your jurisdiction adopted? (*all that apply*)**

- Alternative fuels
- Hybrid technology
- LEED certified facilities (bus shelters, terminals, etc.)

Other (*please specify*)\_\_\_\_\_

**3. Does your jurisdiction employ any strategies that seek means to reduce vehicle miles traveled? (*all that apply*)**

- Transit passes
- Carpool program
- Limit parking availability
- Bike sharing program
- Pedestrian infrastructure supporting transit accessibility
- Mobility fees
- Public education on alternative travel modes

Other (*please specify*)\_\_\_\_\_

**10. Organization and Intergovernmental Relations**

**1. What organization or entity is most active in promoting energy sustainability in your community?**

**2. Does your government have a separate agency or office responsible for energy conservation/ sustainability?**

- No
- Yes
- Don't Know

**3. How frequently do you or other officials of your government contract ( for information, advice, etc.) the following governments/ organizations regarding energy and/or climate change issues?**

	Weekly	Monthly	Annually	Never
County Government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Medium or large cities (population 25K +)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Small cities (pop<25K)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special districts (s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional Planning council	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State Agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Council of Governments	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private utility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
MPO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional partnerships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**1. Has your government engaged in any of the following collaborative actions related to land use related greenhouse gas emissions? (check all that apply)**

- Worked with other agencies or local governments in activities such as an inventory of GHG emissions
- Joined a collaborative partnership with other local entities
- Entered into an informal agreement with one or more local governments on energy issues
- Entered into a formal agreement with one or more local governments on energy issues

- Enacted changes to your comprehensive plan or other local plans based on regional planning efforts
- None of the above

**5. To what extent would the following individuals or groups support or oppose energy conservation and climate protection efforts by your government?**

	Strongly Oppose	Moderately Oppose	Neutral	Moderately Support	Strongly Support
City manager (or chief administrator)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chamber of commerce	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Neighborhood organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental groups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Real Estate developers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Homeowner associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The media	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The general public	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
City council/ commission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Members of city staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Key community leaders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**11. Investing in Energy & Climate Change Competencies**

**1. In the past year, have employees or elected officials of your jurisdiction attended energy or climate change related workshops training or seminars**

	Yes	No	Don't Know
National organizations (APA, ICMA, ULI, ICLEI, etc. )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
State or local organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal or state government entities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Universities or other educational institution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify) _____			

**2. To the best of your knowledge, about how often would you say that your agency’s planning staff consults the following resources when dealing with community energy sustainability and climate change issues?**

	Weekly	Monthly	Annually	Never
EPA Energy & Climate on-line information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. DOE Energy Information Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. DOE Climate Change site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. DOE Smart Communities Network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. Economic Development Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. DOT and Federal Highway Administration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. Housing and Urban Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
U.S. Department of Agriculture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
USCM Center for Sustainable Communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ICLEI USA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Department of Community Affairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Center for Livable Communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Energy Extension Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Housing Coalition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Main Street	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Sustainable Communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Department of Transportation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Department of Health	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FL Energy Office of the Governor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**12. Respondent Information**

1. How many years of experience do you have in the planning profession? \_\_\_\_\_

2. What is your specialization? (Check all that apply)

- Community (re) development
- Land Use or Code Enforcement
- Transportation Planning
- Environment/ Natural Resources
- Urban Design

- Economic Planning/ Development
- Management/ Budgeting/ Finance
- Housing
- Facilities/ Infrastructure
- Preservation
- Planning Methods
- Parks & Recreation

**3. What is the highest level of education you've obtained? \_\_\_\_\_**

**4. How many people do you supervise? \_\_\_\_\_**

**5. How many planners are employed by your jurisdiction? \_\_\_\_\_**

## APPENDIX D

### RESPONDING CITIES (N = 147)

City Name	Incentives for Energy efficient technology Development	Incentives for Renewable Energy Development	Regulatory Relief for Energy efficient technology Development	Regulatory Relief for Renewable Energy Development
Apopka	0	0	0	1
Archer	0	0	0	0
Auburndale	0	0	0	0
Avon Park	1	1	0	0
Bal Harbour	0	0	0	0
Baldwin	0	0	0	1
Bartow	0	0	0	0
Belle Isle	0	1	1	0
Belleair	1	0	0	0
Boca Raton	0	0	1	0
Boynton Beach	0	0	1	1
Bradenton	1	0	1	1
Bradenton Beach	0	0	0	0
Bronson	0	0	0	0
Brooksville	0	0	0	0
Bunnell	0	0	1	0
Callahan	1	1	0	0
Callaway	0	0	0	0
Cape Coral	0	1	0	1
Casselberry	0	0	0	0
Clearwater	0	0	0	0
Clermont	0	0	0	0
Coconut Creek	0	1	0	0
Cooper City	0	0	0	0
Coral Gables	0	0	0	0
Coral Springs	0	0	1	0



Crestview	0	0	0	0
Cross City	0	0	0	0
CutlerBay	1	1	1	1
Dania Beach	0	0	0	0
Davenport	0	0	0	0
Davie	0	0	0	0
Daytona Beach				
Shores	0	0	1	0
DeBary	0	0	0	0
DeFuniak Springs	0	0	0	0
Deland	0	0	0	0
Delray Beach	1	1	0	0
Deltona	0	0	1	1
Destin	0	0	0	0
Dundee	0	0	0	0
Eagle Lake	0	0	0	0
Edgewater	1	1	1	1
Eustis	0	1	1	1
Fellsmere	0	1	0	1
Fernandina Beach	0	0	0	0
Fort Lauderdale	0	0	0	0
Fort Myers	0	0	0	0
Fort Myers Beach	0	0	0	0
Fort Walton Beach	1	1	1	1
Freeport	0	0	0	0
Gainesville	0	0	0	0
Gretna	0	0	0	1
Groveland	1	1	1	1
Haines City	0	0	0	0
Hallandale Beach	1	1	0	0
Havana	0	0	0	0
Hawthorne	0	0	0	0
Hialeah Gardens	0	0	0	0
High Springs	0	0	0	0
Highland Beach	0	0	0	0
Hillsboro Beach	0	0	0	0
Hypoluxo	0	0	0	0
Indian River Shores	0	0	0	0
Indian Rocks Beach	0	0	0	0
Interlachen	0	0	0	0
Inverness	0	0	0	0
Jacksonville Beach	0	0	0	0
Keystone Heights	0	0	0	0

Kissimmee	0	0	1	1
Lake Placid	0	0	0	0
Lake Wales	1	1	0	0
Lakeland	1	1	1	1
Lantana	0	0	0	0
Lauderdale Lakes	0	0	0	0
Lauderdale-by-the Sea	0	0	0	0
Lauderhill	0	0	0	0
Leesburg	0	1	0	1
Lighthouse Point	0	0	0	0
Longboat Key	0	0	0	0
Longwood	0	0	0	0
Lynn Haven	0	0	0	0
Malabar	0	0	0	0
Mangonia Park	1	1	1	1
Margate	0	0	0	0
Marianna	0	0	0	0
Melbourne	0	0	0	0
Melbourne Beach	0	0	0	0
Miami	0	0	1	1
Miami Shores	0	0	0	0
Milton	0	0	0	0
Minneola	1	1	1	1
Miramar	0	0	0	0
Monticello	0	0	0	0
Montverde	0	0	1	1
Mount Dora	0	0	0	0
Naples	0	0	0	0
Neptune Beach	0	0	0	0
New Port Richey	0	0	0	0
New Smyrna Beach	0	0	0	0
Newberry	0	0	0	0
North Lauderdale	0	1	0	0
North Miami	0	0	1	0
North Port	0	0	1	1
Oak Hill	0	0	0	0
Oakland	0	0	0	0
Oakland Park	0	0	0	0
Ocoee	0	0	0	0
Oldsmar	0	0	0	0
Orange City	0	0	0	0
Orange Park	0	0	1	1

Orlando	1	1	0	0
Ormond Beach	0	0	0	0
Oviedo	0	0	0	0
Palatka	0	0	0	0
Palm Bay	1	1	1	1
Palm Coast	1	0	1	0
Palmetto	0	0	0	0
Panama City	0	0	0	0
Panama City Beach	0	0	0	0
Pembroke Park	0	0	0	0
Pembroke Pines	0	0	1	0
Pinecrest	0	0	1	1
Pinellas Park	0	0	0	0
Plant City	0	0	0	1
Polk City	0	0	0	0
Port Orange	0	0	1	1
Port Richey	0	0	0	0
Port St. Lucie	0	0	0	0
Redington Shores	0	0	0	0
Rockledge	0	0	0	0
Sanford	0	0	0	0
Seminole	0	0	0	1
South Miami	0	0	0	0
Southwest Ranches	0	0	0	0
St.Petersburg	0	0	0	0
Tallahassee	1	0	1	1
Tamarac	0	0	0	0
Tampa	0	0	1	0
Temple Terrace	0	0	0	0
Titusville	0	1	1	1
Umatilla	0	0	0	0
Wellington	0	0	1	1
West Melbourne	0	0	0	0
West Palm Beach	0	0	0	0
Wilton Manors	1	0	1	0
Winter Park	0	0	0	0
Zephyrhills	0	0	0	0

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# BIOGRAPHICAL SKETCH

## EDUCATION

- Ph.D. in Askew School of Public Administration and Policy, Florida State University, 2011.  
Dissertation: *The Political Economy of Energy Based Green Economic Development*  
(Professor Directing Dissertation: Dr. Richard C. Feiock; Other Committee Members:  
Frances S. Berry, Keon-Hyung Lee, and Timothy C. Chapin)
- M.P.A. in the Department of Public Administration from Hanyang University, 2004  
MPA thesis: *The Instruments and Choice for Public Works Management* (Professor  
Directing Thesis: Dr. Tae-Yun Kim)
- B.S. in the Department of Political Science and Diplomacy from Hanyang University, 2002

## RESEARCH FIELDS

Local Government, Public Policy and Analysis, Policy Performance and Evaluation, and  
Collective Action Problems and Networks especially relating to Green Growth, Economic  
Development, Environment, Energy, and Health Issues, Methodology

## RESEARCH AND JOB EXPERIENCE

### *Teaching Assistant*

Mar., 2002 – Dec., 2004, Teaching Assistant

Graduate Course: Research Methods of Social Science (Spring Semester 02)

Public Choice Theory (Fall Semester 02)

Regulatory Administration (Spring Semester 03)

Organization Development and Design (Spring Semester 03)

Undergraduate Course: 21<sup>st</sup> Century Leadership (Fall Semester 02 to Fall Semester 03)

### *Research Assistant*

Sep., 2009 – May, 2011, Research Assistant – Center for Sustainable Energy and Governance,  
Florida State University

Survey and Data Management

Energy Efficiency and Conservation Block Grant Program Survey, 2011

Energy Sustainable Florida Communities Survey, 2010

Sep., 2008 – May, 2009, Research Assistant - Reubin O'D. Askew School of Public  
Administration and Policy, Florida State University

Data Management and Analyses

Data collection on energy sustainability (1975 to 2008)  
Data collection of forms of government at Florida cities (1960 to 2007)  
Data collection of forms of government at Florida counties (1980 to 2007)

Jan., 2002 – Sep., 2004, Research Assistant, The Department of Public Administration, Hanyang University, Seoul, Korea  
Analysis and Evaluation of Achievement Report of Each Corporation  
Funded by Korea Local Government Management Institute

### ***Job Experiences***

Feb., 2007 – July, 2007, Assistant Program Evaluator (part-time), Program Evaluation Division of Korea National Budget Office, Performance Evaluation of Nine Ministries

Nov., 2006 – Feb., 2007, Assistant Researcher, Human Resources Management Center, The Korea Institute of Public Administration  
Topic: Organization Diagnosis of Knowledge Information Service Center of Korea Post.  
Responsibility: Evaluation of Organizational Structure and Role

Aug., - Oct., 2006, Assistant Researcher, Department of Urban Management, Seoul Development Institute  
Topic: Comparison of International Tourism Competitiveness of East Asia Cities  
Responsibility: Comparative Analysis of Six Cities by Statistical Analysis, Funded by Seoul Metropolitan Government

### **PUBLISHED ARTICLES**

- Ha, Hyunsang and Inwon Lee. 2011. Adoption of Institutional Options for Affordable Housing Production: Collective Action Problems and Choice of Institutional Options. *International Review of Public Administration*, forthcoming.
- Ha, Hyunsang and Richard C. Feiock. 2011. Bargaining, Networks, and Management of Municipal Development Subsidies. *American Review of Public Administration*, forthcoming.
- Ha, Hyunsang and Ricard C. Feiock. 2011. The Application and Bargaining of Performance Agreements for Local Economic Development, *International Review of Public Administration*, 15(3): 13-26.
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- Ha, Hyunsang. 2007. Rent Seeking for Attraction of PIMFY Facilities: Rent Seeking of Local Governments to Korea Electric Power Corporation, *Korean Journal of Policy Analysis and Evaluation*, 17(3): 193-219. (In Korean)
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Kim, Tae-Yun and Hyunsang Ha. 2005. Who is Supposed to be in Charge of Public Works Management?: Applying General Model to Funeral Service Hall in Pusan Young-Lark Park, *Korean Public Administration Review*, 39(3): 275-299. (In Korean)

## **BOOK REVIEWS**

Ha, Hyunsang 2011. Book Review: Self-Organizing Federalism: Collaborative Mechanisms to Mitigate Institutional Collective Action Dilemmas, edited by Richard C. Feiock & John T. Scholz. *International Review of Public Administration*, 16(1): 201-204.

## **MANUSCRIPTS UNDER REVIEW**

Ha, Hyunsang, Inwon Lee, and Richard C. Feiock. *Organizational Network Activities for Local Economic Development: Interactions between a Local Government and Public, Mixed, and Private Organizations.*

Ha, Hyunsang and Richard C. Feiock. *Business Incentive Controls and Bargaining of Government and Business: Performance Agreements and Clawback Clauses of Municipal Governments.*

## **PAPERS IN PROGRESS**

Ha, Hyunsang and Richard C. Feiock. *What is determine the Adoption of Policy Tools for Climate Change Mitigation and Renewable Energy Development?*

Ha, Hyunsang and Richard C. Feiock. *Incentives and Regulatory Relief for Efficient Energy Use Technology Development and Sustainable Development*

Ha, Hyunsang and Richard C. Feiock. *Local Sustainability: Comparison of Incentives Promoting Economic Value and Environmental Protection in Green Economic Development*

Ha, Hyunsang and Richard C. Feiock. *Regulatory Relief for Economic Growth and Eco-system Balance and Green Economic Development*

Ha, Hyunsang and Richard C. Feiock. *The Use of Policy Tools for Green Economic Development and Economic Performance*

Ha, Hyunsang, Inwon Lee, and Richard C. Feiock. *Network Organizations and Economic Performance in Local Economic Development*

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Ha, Hyunsang, Jeongh Bae, and Keon-Hyung Lee. *Factors Affecting Health Disparity: A Contextual Approach Using Institutional Analysis and Development (IAD) Framework*

Ha, Hyunsang and Keon-Hyung Lee. *The Influences of Medicaid Programs on Medicaid Expenditures*

Ha, Hyunsang and Frances Stokes Berry. *Conceptualizing Network Externalities in Policy Diffusion*

Ha, Hyunsang and Hoseok Jang. *Understanding the Influence of Externalities on Rent Seeking of Local Government*

Ha, Hyunsang and Jongsun Park. *Collective Action and Externalities: Behavioral Pattern and Network Structure*

## **PROFESSIONAL PRESENTATIONS**

- Ha, Hyunsang and Keon-Hyung Lee. 2011. *Policy Adoption and Political Ideology and their Influences on Medicaid Expenditures*, American Society for Public Administration Annual Meeting, Baltimore, MD
- Ha, Hyunsang and Frances Stokes Berry. 2010. *Conceptualizing Network Externalities in Policy Diffusion*, Southern Political Science Association Annual Meeting, Atlanta, GA
- Jang, Hoseok and Hyunsang Ha. 2010. *Governance of Public, Non-profit, and Private Organizations in Economic Development*, Southern Political Science Association Annual Meeting, Atlanta, GA
- Ha, Hyunsang, Inwon Lee, and Richard C. Feiock. 2010. *Organizational Networks and Economic Performance in Local Economic Development*, Southern Political Science Association Annual Meeting, Atlanta, GA
- Ha, Hyunsang, Jeongh Bae, and Keon-Hyung Lee. 2009. *Factors Affecting Health Disparity: A Contextual Approach Using Institutional Analysis and Development (IAD) Framework*, Midwest Political Science Association 67th Annual National Conference, Chicago, IL
- Ha, Hyunsang and Richard C. Feiock. 2009. *The Political Economy of Local Government Business Subsidy*, Southern Political Science Association Conference, New Orleans, LA
- Ha, Hyunsang, Jongsun Park, and Richard C. Feiock. 2008. *The Impact of Externalities on Behavioral Pattern and Network Structure of Collective Action*, Southeastern Conference for Public Administration, Orlando, FL
- Ha, Hyunsang and Inwon Lee. 2008. *Network Organizations and Economic Performance in Local Economic Development*, Southeastern Conference for Public Administration, Orlando, FL
- Ha, Hyunsang, Richard C. Feiock, and Inwon Lee. 2008. *Institutional Choices for Affordable Housing Development*, Southeastern Conference for Public Administration, Orlando, FL
- Ha, Hyunsang, Richard C. Feiock, and Jongsun Park. 2007. *Collective Action and Externalities: Behavioral Pattern and Network Structure*, Florida Political Science Association Annual Meeting, Tampa, FL
- Ha, Hyunsang. 2006. *Rent Seeking of Local Governments for Attraction of Quasi-Government: Relocation of Korea Electric Power Corporation*, The Korean Association for Policy Studies Annual Meeting, Seoul, Korea

## **HONORS AND AWARDS**

Founders' Forum Fellow – American Society for Public Administration, March, 2011  
Poster Award (First place) at Social Science and Public Policy Aspects of Sustainable Energy and Climate Change: A Student Research Competition – Florida State University and Institute for Energy Systems, Economics and Sustainability (IESES), “Policy Tools for Green Economic Development and Green Jobs,” Dec., 2010

Prestage-Cook Travel Award – Southern Political Science Association, Jan., 2010  
Research Assistantship (Spring Semester 2008 to Present)  
Excellent Scholarship (Fall Semester 2002 to Fall Semester 2003)  
Research Assistantship (Spring Semester 2002)  
Scholarship for Honor (Dean's List: Spring Semester 2001; Fall Semester 2000,  
Dean's List (Top): Spring Semester 2000, Fall Semester 1999; Spring  
Semester 1999; Fall Semester 1998)

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